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Brave New Wireless World: Mapping the Rise of Ubiquitous Connectivity from Myth to Market

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A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Media Studies

BRAVE NEW WIRELESS WORLD: MAPPING THE RISE OF UBIQUITOUS CONNECTIVITY FROM MYTH TO MARKET

(Thesis format: Monograph)

by

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Abstract

This dissertation offers a critical and historical analysis of the myth of ubiquitous connectivity—a myth widely associated with the technological capabilities offered by "always on" Internet-enabled mobile devices like smartphones and tablets. This myth proclaims that work and social life are optimized, made more flexible, manageable, and productive, through the use of these devices and their related services. The prevalence of this myth—whether articulated as commercial strategy, organizational goal, or mode of social mediation—offers repeated claims that the experience and organization of daily life has passed a technological threshold. Its proponents champion the virtues of the invisible "last mile" tethering individuals (through their devices) primarily to commercial networks.

The purpose of this dissertation is to uncover the interaction between the proliferation of media artifacts and the political economic forces and relations occluded by this myth. To do this, herein the development of the BlackBerry, as a specific brand of devices and services, is shown to be intimately interrelated with the myth of ubiquitous connectivity. It demonstrates that the BlackBerry is a technical artifact whose history sheds light on key characteristics of our media environment and the political economic dynamics shaping the development of other technologies, workforce composition and management, and more general consumption proclivities. By pointing to the analytic significance of the BlackBerry, this work does not intend to simply praise its creators for their technical and commercial achievements. Instead, it aims to show how these achievements express a synthesis that represents the motivations of economic actors and prevailing modes of thought most particularly as they are drawn together in and through the myth of ubiquitous connectivity. The narrative arc of this dissertation is anchored by moments of harmonization among political economic interests as these shape (and are shaped by) prevailing modes of producing and relating through ubiquitous connectivity.

Using the story of the BlackBerry as its case study and building on the analysis of myth and media history developed by Vincent Mosco and Armand Mattelart, this dissertation both critiques and employs myth as a concept to analyze the technical and commercial ascent of ubiquitous connectivity in three stages: 1) the commercialization of wireless data in North America, 2) the conceptualization of a mobile workforce and virtual enterprises, and finally, 3) the consumerization of ubiquitous connectivity through the incorporation of web 2.0 ideals. In order to accomplish this, it relies on critical approaches to media theory (including the works of Harold Innis and Marshall McLuhan) and political economy (drawing from Karl Marx, David Harvey, and others). This dissertation makes use of corporate communications, marketing and advertising, newspaper articles, and trade journals to explicate its analysis. It also utilizes a series of interviews with employees at Research In Motion involved in computer engineering, marketing and advertising, product development, and user-experience design.

Keywords

Political Economy, Myth, BlackBerry, Smartphone, Mobile Media, Media Theory, Ubiquitous Connectivity, Research In Motion, New Economy

Acknowledgements

It seems impossible to properly thank all of the individuals that have contributed to the completion of this project without deploying one or another cliché. While I may, at times, appear to simply reiterate truisms regarding the importance of friends and family, and relationships both professional and social, I do want to reinforce at the outset my sincere and heartfelt thanks to all those mentioned below.

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List of Acronyms

API	Application Programming Interface
ARDIS	Advanced Radio Data Information Service
B2E	Business-to-Enterprise
BBM	BlackBerry Messenger
BCE	Bell Communication Enterprises
BES	BlackBerry Enterprise Server
BPR	Business Process Re-Engineering
CCC	Communication, Co-operation, Cognition
CDC	Control Data Corporation
CDMA	Code Division Multiple Access
CDPD	Cellular Digital Packet Data
CEO	Chief Executive Officer
CIO	Chief Information Officer
CRM	Customer Relationship Management
CRTC	Canadian Radio-Television & Telecommunications Commission
CSC	Computer Supported Collaboration
CSCW	Computer Supported Collaborative Work
CTIA	Cable and Telecommunications Industry Association
CTO	Chief Technology Officer
CTT	Canada’s Technology Triangle
CVCA	Canada’s Venture Capital and Private Equity Association
DJIA	Dow Jones Industrial Average
ECMS	Enterprise Content Management System
ECW	Enterprise Content Warehouse

EDGE	Enhanced Data Rate for GSM Evolution
EPO	European Patent Office
FCC	Federal Communications Commission
FDI	Foreign Direct Investment
FDMA	Frequency Division Multiple Access
FTC	Federal Trade Commission
GDP	Gross Domestic Product
GM	General Motors
GSM	Global System for Mobile
GSMA	GSM Association
GPRS	General Packet Relay System
HP	Hewlett-Packard
ICT	Information and Communication Technology
IEEE	Institute of Electrical and Electronics Engineers
IMD	Internet-enabled Mobile Device
IP	Internet Protocol
IPO	Initial Public Offering
ISP	Internet Service Provider
IT	Information Technology
ITU	International Telecommunications Union
JIT	Just-in-Time
LAN	Local Access Network
LED	Light Emitting Diode
M2M	Machine-to-Machine
MNC	Multinational Corporation
MPC	Mobitex Protocol Converter

MFP	Multi-Factor Productivity
MVNO	Mobile Virtual Network Operator
NAFTA	North American Free Trade Agreement
NASDAQ	National Association of Securities Dealers Automated Quotations
NFC	Near Field Communication
NOC	Network Operation Center
NSI	National System of Innovation
ODC	Ontario Development Corporation
OECD	Organization for Economic Co-Operation and Development
OEM	Original Equipment Manufacturer
OS	Operating System
OTF	Ontario Technology Fund
PAN	Personal Access Network
PC	Personal Computer
PDA	Personal Digital Assistant
PIM	Personal Information Management
PMR	Private Mobile Radio
PPP	Public-Private Partnership
R&D	Research and Development
RFID	Radio-Frequency Identification
RIM	Research in Motion
ROI	Return on Investment
SMB	Small-to-Medium Business
SMW	Social Media Work
SR&ED	Scientific Research and Experimental Development
TDMA	Time Division Multiple Access

TNC	Transnational Corporation
UC	Ubiquitous Connectivity
UGC	User-generated Content
USPO	United States Patent Office
USPTO	U.S. Patent and Trademark Office
USR	U.S. Robotics
WFMS	Workflow Management Systems
VC	Venture Capital
VOIP	Voice Over Internet Protocol
WLAN	Wireless Local Access Network

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Chapter 1 – Everywhere, Everything, Always: The Age of Ubiquitous Media

"Everywhere everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering." (Heidegger, 1977, p. 17)

1 Introduction: The BlackBerry as Technological Artifact

A 2012 *Financial Times* special report on "The Connected Business" featured an article titled "Mobility ushers in a brave new world" warning businesses everywhere that "customers and employees expect to interact with them immediately, wherever they may be" (Taylor, 2012). The advice offered in the *Financial Times*—that organizations must adapt to this brave new "wireless" world[1]—is merely one expression of the conventional wisdom being embraced by some of the most significant media companies, ranging from Internet service providers (ISP),[2] media conglomerates,[3] telecommunications providers,[4] hardware manufacturers,[5] and software developers.[6] Even governments[7] are being

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[1] Although a common "go to" literary reference for technology journalists, references to a "brave new world" in the coverage of wireless devices and services regularly invoke the crossing of a crucial threshold. See for example Hall, 2010; Deloitte, 2008. In a 10 year retrospective of the BlackBerry, a Engadget blogger proclaimed that the device ushered in a "brave new world" by untethering corporate executives (Ziegler, 2009). More recently, the launch of the BlackBerry 10 line of devices was accompanied by a *Globe and Mail* headline announcing "BlackBerry's brave new world" (Krashinsky, 2013). I will return to the irony of this usage in the conclusion.

[2] For example, Time Warner Cable's *Road Runner* mobile hotspot service. See http://www.timewarnercable.com/East/about/inthenewsdetails.ashx?PRID=2951&MarketID=144

[3] For example, Rogers Communications' *Anywhere TV*. See http://www.rogersondemand.com/

[4] For example, the creation of *Everything Everywhere*, a joint venture between European telecommunications providers T-Mobile and Orange. See http://everythingeverywhere.com/

[5] For example, Qualcomm's *Internet of Everything* initiatives. See http://www.qca.qualcomm.com/networking/technology.php?nav1=149

[6] For example, Microsoft's push into cloud computing and storage with its *SkyDrive* service. See promotional video: http://www.youtube.com/watch?v=ImzKSd3cGrc&list=FLXt5xZ5g2ASyIrIEioNOjkg

affected. Predictably, marketing and advertising strategies have emerged to exploit new commercial opportunities associated with these buzzwords.[8] This new rhetoric is marked by the prominence of the words "anywhere," "anyplace," "everything," "everywhere," "anytime," and "always." What these terms all express is the essential importance of *ubiquitous connectivity* (UC) as a media narrative with cultural, political, and economic significance. The prevalence of UC both as a commercial strategy and organizational goal implies that the experience and organization of daily life itself has passed a technological threshold. Such grand claims, however, are not particularly new or unique. In fact, myths of technological transcendence have a long history, and are particularly central to the advertising and marketing initiatives associated with new information and communication technologies (Mosco, 2004).

To historicize UC and its claims of transcendence, I use the BlackBerry as a technological artifact whose history sheds light on key characteristics of our contemporary media environment. Beyond the superficial, often seductive, veneer of

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[7] For example, the U.S. Government's digital strategy that seeks to "deliver information and services to the American people anytime, anywhere and on any platform or device." See https://cio.gov/building-a-21st-century-government/digital-strategy/

[8] For example, the expanding literature on "U-Commerce": Richard T. Watson, Leyland F. Pitt, Pierre Berthon, George M. Zinkhan. "U-Commerce : Expanding the Universe of Marketing."*Journal of the Academy of Marketing Science* 30(4): 333-347; H. Galanxhi-Janaqi and F.F. Nah. 2004. "U-commerce: emerging trends and research issues." *Industrial Management and Data Systems*, 104: 744-755; G. Roussos. 2006. *Ubiquitous and Pervasive Commerce: New Frontiers for Electronic Business*. London: Springer; C. Evans and B. Hu. 2006. "E-commerce to U-business: A model for ubiquitous shopping mall," *International Symposium on Pervasive Computing and Applications* 427-432; J. Seigneur and C.D. Jensen. 2004. "Trust Enhanced Ubiquitous Payment without Too Much Privacy Loss," *Proceeding of the 19th Annual ACM Symposium on Applied Computing,* 1593-1599; K.J. Lee and J. Ju. 2007. "Ubiquitous Commerce Business Models Based on Ubiquitous Media" in *Business Information Systems.*

capital's institutional myth-makers, the roots of techno-utopian myths extend deeper into the history and political economy of advanced capitalism. The analytic significance of the BlackBerry is not intended to offer praise for its technical or commercial achievements, but instead to show how these achievements express a synthesis representing the motivations of economic actors and prevailing modes of thought as they are drawn together in and through the myth of UC. This myth is significant because it describes the "last mile" tethering individuals wirelessly to primarily commercial networks. The story of the BlackBerry that I will map is one wherein brand identity, including a tight integration of services and products, is precisely based upon the perception that a final technological and commercial threshold has been reached.

While this threshold has only recently become a technical, economic, and cultural reality, it is the culmination of a much longer history—a history that stitches together the emancipatory values of the Enlightenment to the volatile permutations of capitalism and its restless dependence on technological change, animated by a dialectic between the forces and relations of capitalist production.[9] More specifically, myths of a ubiquitously networked society have been documented extensively elsewhere (e.g., Burnett et al., 2009, Carey, 1992; Mattelart, 2000, 2003). Contributing to this existing literature, this project examines the myth of UC as articulated by the development of specific branded products and services. The myth of UC, as this dissertation will demonstrate, offers a

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[9] Following Harvey's (2006, p. 99) explication of Marx's concept, by productive forces I mean the power to transform nature through the development of new technologies (e.g., spectrum technologies); and by relations of production I mean the social organization and implications of the "what, how, and why of production" (e.g., wage labour) (p. 99). Thus what follows in this dissertation is, in part, an attempt to penetrate beneath the surface appearance [what I term "myth"] and understand why particular labour processes take on the specific technological forms that they do (p. 99).

contemporary expression of this process. While this dissertation gestures towards the "long-history" of the information technology revolution (Webster & Robins, 1999), both its goal and scope are more modest. This dissertation provides a critical analysis of how UC emerged from the interplay between political economic interests, technical advancements, and pre-existing myths.

Given its waning commercial standing, it is easy to forget that the BlackBerry brand, for a time, inspired fanatical devotion, spawning various online fan, user, and support groups (Michaluk, 2011). The fanatical devotion to the BlackBerry brand, and its UC-enabled lifestyle, was rivaled only by those initiated into the "Cult of Mac." As evidence, consider that in 2001 a *USA Today* cover story declared the BlackBerry to be "the heroin of mobile computing" (Maney, 2001). Yet despite what many of the manic technology "experts" may have said, the BlackBerry's significance is not in its singular existence as a popular product, brand, or investment stock. Nor is its cultural, technical, or political economic importance. Rather, it is in the way that these all come to be tied together in a specific technical artifact. What follows is an attempt to untangle all of these, indeed, *to map their interconnections* through this case study in order to historicize the myth of UC.[10]

In so doing, this dissertation frames the BlackBerry as a central case study that maps the historical factors underpinning the harmonization of political economic

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[10] Following Frederic Jameson, by *mapping* I seek to demonstrate how the "great global multinational and decentered communicational network in which we find ourselves caught as individual subjects" (Jameson, 1998, p. 16) is mutually constituted by the "individual reflections on, and perceptions of, one's relationship to the social world that oil the gears of everyday life" (Best, 2010, p. 57).

interests, technical advancements, and pre-existing myths. In mapping these factors, I also foreground important ways in which the drive towards UC has led to failure—whether due to technical limitations, political economic conflicts, or lack of demand.[11] It is important to note that the BlackBerry is also representative of a relatively new category of consumer electronics that I refer to as Internet-enabled mobile devices (IMD).[12] The BlackBerry, however, is more than just another consumer device. It represents a total end-to-end system enabling UC, comprising the integration of devices, software, and networking infrastructure.

The BlackBerry is an ideal object of analysis for engaging with the myth of UC as representative of a *media condition* precisely because it problematizes the concept of an artifact. The BlackBerry brand acts as an appropriate proxy for the myth of UC because its own brand identity is so closely connected to UC as a new way of life. It is thus a channel for the myth, but also the technical and commercial means by which individuals (and corporations) can realize (and reproduce) the myth. In the earliest stages, this was defined primarily by ubiquitous email, the push-based communication of data wirelessly,

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[11] Arguably, RIM's recent decline in North America is a reflection not only of limitations of technical capacities, but of the evolution of UC into more than just a set of consumer products and services; that is, into a *platform* for the expansion of virtual consumption. The influence of web 2.0 and prosumption on the BlackBerry's final iteration of UC (discussed in Chapter 8), before its decline in the face of competitors Apple and Google, signaled the limitations of the myths that sustained RIM's initial rise to prominence. I do briefly address RIM's decline in the final chapter and point to future areas of research on the evolution of UC and its "re-mythologizing."

[12] In this project, IMD refers primarily to smartphones and tablets, though industry-tracking firm IDC also includes laptops, netbooks, and other portable PC hybrids under the category of smart mobile devices. According to IDC, worldwide smart phone sales are projected to reach 686 million in 2012 (IDC, 2012a); tablet sales are expected to reach 117 million (IDC, 2012b). Ovum, another prominent industry research firm, projects annual smart phone sales of 1.7 billion units by 2017 (Ovum, 2012). Perhaps more telling, according to the ITU, in 2011, globally there were 5.9 billion cellular subscriptions (versus 1.15 billion fixed telephone lines) and 1.2 billion mobile broadband subscriptions (versus 592 million fixed broadband subscription) (ITU, 2011). As 3G/4G network coverage expands and handset costs decline, the availability of UC will reach the vast majority of humanity, and for many, become a basic staple of everyday life.

and "always on" functionality. The BlackBerry brand, as this dissertation demonstrates, evolved to pitch UC as a part of sociality itself, an essential mediator of our identity and social networks—a sentiment given form in the 2010 BlackBerry slogan "take life with you." The BlackBerry also affords an opportunity to see the constitution of a generally new category of devices and services built on the myth of UC and its technological infrastructure/components (i.e., IMD). Thus if we line up every BlackBerry model, from first to most recent, we see expressed in them the commercial impulses that have now seemingly enveloped the entire globe: the construction of UC not simply as a condition of work consonant with the networked organization or economy, but of a new lifestyle that reflects both a series of ruptures and continuities with the techno-mythology of capitalism itself. This is a story that is visually told in the physical evolution of the BlackBerry; that is, its morphology as a consumer device, outwardly expressed in a way not possessed by later technologies like the iPhone, in which one observes only relatively small outward differences amongst generations.[13] However, the story is not only one of outer appearance, but also of internal operations, software, processing power, and miniaturization. As case study, the evolution of the Blackberry illustrates the colonization[14] of everyday life by computer processing, arguably reaching a developmental finality begun with the popular deployment of the transistor, followed by the integrated circuit and finally the microchip.

Though the subject of this dissertation is *connectivity* (in myth, media, and power),

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[13] A visual history of BlackBerry devices is available at http://crackberry.com/blackberry-timeline

[14] By "colonization" I mean both the proliferation of available digital devices and services as well as their seamless embedding into the rhythms of everyday life.

its analysis begins with the material object. I here take some inspiration from Marx's opening chapters in *Capital Volume 1* which strategically begins with an analysis of the commodity in order to set the stage for a more systemic imminent critique of bourgeois political economy. Social relations are (re)produced as lived experience, but artifacts offer the material trace of these experiences and their specific political economic pretexts, although fetishization, Marx explains, conceals these pretexts. As Marx wrote, "The hand-mill gives you society with the feudal lord; the steam mill, society with the industrial capitalist" (Marx, 1984, p. 102). One should not take Marx's observation to be espousing a deterministic, causal relationship between social and technological change. Rather, as Barney suggests,

> What Marx appears to be saying in this aphorism is that certain technologies are indicative of, or significant to, particular productive relations. He may be going so far as to posit that these technologies facilitate particular relations, but, unlike the determinist reading, this is well within what is suggested by "giving." (Barney, 2000, p. 35)

So too I argue that informational capitalism[15] gives us the IMD, and for the purposes of analysis, in this case, the BlackBerry. This is not to make a deterministic and causal relationship, but rather to demonstrate how human capacities are organized and articulated by the prevailing mode of production and its specific technological

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[15] By *informational capitalism*, I mean a version of capitalism whose dialectic between forces and relations of production revolves around technologies specifically designed (and marketed) to enhance, capture, transmit, and store human intellective capacities such as creativity, communication, co-operation, and cognition. I use the acronym CCC to refer to these capacities. For a detailed discussion of *informational capitalism* see Fuchs, 2009.

apparatus(es).

As myth, UC refers to the championing of a radically new condition of mediation by a variety of commercial interests adapting to neoliberal policies and post-Fordist labour arrangements. This myth is embedded in the re-composition of the labour force away from comparatively inflexible unions and other contractual arrangement towards more flexible (and precarious) forms of work. As myth is made *real* through new devices and services, UC builds on a vision of a future workforce and culture, one requiring new tools to meet and manage their professional and social needs in order to make them more flexible, manageable, and productive. This belief in the future trajectory of both work and sociality, as this dissertation demonstrates, influenced the investment in research and development (R&D), the building of capacity in wireless data and component manufacturing, the search for new devices that could be paradigmatic of this forthcoming post-industrial workforce, and the development of related policies conducive to these processes. On the other side, the availability of these early devices and services, even though they were primitive, offered a blueprint upon which future workers could be both managed and empowered, to create a new type of organization (e.g., *network* or *virtual* organizations). As such, new techniques and conceptualizations emerge as the adoption of devices spreads. Similarly, UC is based on a belief in a future *networked* worker whose professional and social lives are inseparably intertwined.

Thus the task at hand is to uncover and to map the interaction between the proliferation of media artifacts (and related services) and political economic interests. Whether individuals materially experience this condition or whether it exists solely in the realm of popular idealization, is, strictly speaking, beyond the scope of this dissertation.

However, in so far as commercial entities, experts, and consumers adopt UC, perhaps un-reflexively, it gains a reality that can be reproduced and disseminated. My analysis of how the myth of UC is materialized—in marketing and advertising, corporate decision-making, consumer demand, public policy—suggests that capitalism, in its informational form, is seeking a mode of stabilization partly dependent on the condition of mediation entailed by UC. For example, this condition of mediation is an essential component in mobilizing the intellective capacities of both workers and consumers. How these capacities are mobilized, and the extent to which this mobilization is successful, depends partly on the technical composition of the available media. An assessment of historically contingent factors characterizing the composition of technological artifacts, therefore, helps understand *how* and *why* they became what they are (and not something else). Moments of contingency and synchronization offer an opportunity to contextualize the interplay between the evolution of media artifacts and the lived conditions of mediation as both are bound together by specific political economic interests.

As a point of clarification, by mediation I mean the organization of space and time that link the actions (and motivations) of people through broader social structures—institutions like the state, religion, culture, and wage labour. To the extent that this condition is evident to social subjects depends on the prevailing myths that offer master signifiers or archetypes (to borrow terms from psychoanalysis) that are the wellspring of meaning and purpose for individuals, and undergird powerful justifications for the reproduction of dominant (and sometimes insurrectionary) political economic relations and structures. In this respect, the *keywords* (Williams, 1976) are terms such as "knowledge," "creativity," "innovation," "information," "flexibility," and "networks." As

Raymond Williams explains, keywords act as “binding words in certain activities and interpretations” as well as “indicative words in certain forms of thought” (1976, p. 15). Keywords are orienting terms that guide or bind the actions of disparate social actors (and their respective institutions and organizations) as well as frame the boundaries of thinking itself. In this sense, myths, as the repository of such keywords, shape what Williams referred to as the “practical consciousness” constitutive of the “living and interrelating continuity” of everyday life which are often “built into institutions and [cultural] formations” (Williams, 1977, p. 132).

These terms are significant in guiding the behaviour of organizations (particularly employers like governments and corporations) as well as of individuals (workers and consumers). There is an intellectual link between the study of myth as lived culture and the goals of critical political economy, which I outline in chapter 2, since it is precisely the outcome of *naturalization* (of social relations, power structures, and technological change) that myth performs and which critical political economy seeks to expose. As such, this dissertation addresses the following research questions:

a. How are political economic interests, technological change, and myth bound up in the rise of UC? That is, how does UC express changes in the forces and relations of production associated with the rise of a (global) networked society?

b. In what way does the rise of UC build upon and contribute to the proliferating mythos associated with post-industrialism?[16]

c. How does the BlackBerry, as a once iconic technology of UC, offer a case study demonstrating the historical and material intertwining of political economic interests, technological change, and myth?

To answer these questions, I demonstrate how the myth of UC is materialized in a particular consumer technology: the set of devices and services offered by Research in Motion.[17] The narrative arc of this dissertation is anchored by moments of synchronization among political economic interests as these shape prevailing modes of producing and relating through UC. In order to accomplish this, I rely on key critical theoretical approaches to political economy and media theory, as well as on corporate communications, marketing and advertising, newspaper articles, and trade journals. I also draw upon content gleaned from a series of interviews with employees at RIM involved in areas such as computer engineering, marketing and advertising, product development, and user-experience design.

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[16] My choice to emphasize *post-industrial* as a genre of myths reflects the formative significance of Daniel Bell (1973), among others (e.g., Masuda, 1981), in popularizing this term in both scholarly and public policy arenas. It is also a useful umbrella term by which to categorize the proliferation of subsequent names (e.g., "Information Society" or "Network Society"), each suggesting that the basic mode of production has changed in a purported shift away from manual/physical industrial production to one focusing on human intellective capacities as both inputs and outputs of the production process. What these all conceal is not a definitively new mode of production *per se*, but a capitalist re-orientation in light of changes in the dialectic between forces and relations of production (see Garnham, 1998).

[17] Research in Motion was re-branded as "BlackBerry" in January 2013 in conjunction with the launch of its new BB10 platform. Because this dissertation deals almost exclusively with the period preceding this I will refer to the company as Research in Motion or its acronym, RIM.

Using the BlackBerry as its case study, this dissertation demonstrates that the aforementioned political economic synchronization is evident in the myths associated with three necessary steps in the evolution of the myth of UC as a technical and commercial reality: the commercialization of wireless data (chapters 3 and 4), the development of mobile workers and virtual enterprises (chapters 5 and 6), and the ascent of web 2.0 and the online digital prosumer (chapters 7 and 8). It is important to note that the emphasis on historical contingency highlights the limitations of this dissertation's analytic scope. While the focus on the BlackBerry affords a clearly delimited object with which to demonstrate the technical and commercial materialization of the myths associated with UC, it suggests a deeper theorization of the interaction between political economy, myth, and technics.[18]

1.1 On the Appearance and Essence of Ubiquitous Connectivity: Ubiquity, Immediacy, and Personalization

The research questions, purpose, and scope of this dissertation are framed by a media-centric analysis; meaning it uses media *artifacts* (e.g., objects, devices, texts, machines, and tools) in order to study media *conditions* (e.g., the mediation of social relations, power structures, and space and time) and the inter-relationship of such artifacts and conditions. It maintains that a proper analysis of the latter requires taking the factors contributing to the specific technical-composition of the former seriously —a technical

[18] Although I point toward such a theorization when the dissertation narrative affords such opportunity, I will leave a more nuanced development for future work.

composition that is shaped by political economic interests of informational capitalism, and more broadly, by dominant myths.

In existential terms, mediation can be thought of as articulating the relationship between different modalities of human experience. The essence of modern technology, Heidegger writes, is not only a “mere means” to an end, but also a “way of revealing” and “enframing” human potential (Heidegger, 1977, pp. 13-29). Building on Heidegger’s concern with the *essence* of technology, Darin Barney reframes the “question concerning technology” to deal with mediation. Barney writes that,

> Heidegger understood the essence of technology to be located in its mediation between the ontic and the ontological—between the practices of existing beings and a thoughtful engagement with the Being of those beings. Technological practices, like all existential activities, are ontologically significant to the extent they express something at issue in terms of Being. (Barney, 2000, p. 204-205)

In so far as Being is increasingly mediated by complex, capital-intensive technological apparatuses, media—as the ‘infrastructure of Being’—act as tethers to the dialectic of forces and relations of production that underpin historically contingent political economic structures (and interests). As I will discuss below, this mediation offers insights into the limits and barriers associated with the articulation of human capacities.

Three themes expressed through the myth of UC offer an opportunity to analyze the intertwining of appearance and essence[19] in ubiquitous media: ubiquity, immediacy, and personalization.

Ubiquity here refers to both the perceived and actual colonization of digital media devices and, in this case, the technical capacity to remain connected at all times in devices designed to be "always on" and "always on you." The era of ubiquitous media, while the product of a specific set of historical forces that I will map in this dissertation, also poses new theoretical questions for the study of media generally.[20]

Immediacy refers to a perceived instantaneity (or simultaneity) enabled by the devices and infrastructure of UC, tending toward real time, networked communication, and a collapsing of spatial distance. Connectivity (comprised primarily of both the transmission and reception of digital data) is relatively unencumbered by spatial and temporal constraints, effectively tied to the specific location of individuals. In spatial terms, immediacy refers to a perceived direct relation or connection, a proximal experience of "nearness" (Tomlinson, 2007, p. 74). In temporal terms, immediacy refers to something current or instant occurring without seeming delay or lapse in time (Tomlinson, 2007, p. 74). More generally, immediacy highlights the tendency of

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[19] Distinguishing between appearance and essence was a key element of Marx's method in *Capital*. As G.A. Cohen writes, "Marx frequently pronounced his dictum on essence and appearance when he was at work on Capital, which he conceived as an attempt to lay bare the reality underlying and controlling the appearance of capitalist relations of production" (1972, p. 183).

[20] The theme of a recent special issue of *Theory, Culture, and Society* was precisely dedicated to theorizing "ubiquitous media" (Featherstone et al., 2009). Despite the contributions of many prominent theorists including Friedrich Kittler, N. Katherine Hayles, and Bernard Stiegler, the contributions lacked a clear link to political economy. This dissertation hopes to fill in this important gap by offering a focused case study illustrating the specific rise of a prospectively ubiquitous medium.

contemporary media to accelerate the circulation of information. It reflects the general condition of speed up that is experienced phenomenologically at the individual level as equal parts euphoria and anxiety (or as an experience of the technological sublime, as Leo Marx (1964) might characterize it). At the same time, it can also be expressed at the level of a political economic compulsion (as in David Harvey's (1989) conception of space-time compression). John Tomlinson has referred to this pervasive technological milieu as an expression of the "condition of immediacy" (Tomlinson, 2007, pp. 72-93)—as a relatively "new" narrative that encompasses culture, economy, and everyday life.[21]

Personalization refers to the tendency of contemporary media to materially incorporate the identity, information, and relationships of a particular user. The identity of the user is deeply embedded both in the commercial development of digital media as well as in its technical composition (e.g. SIM cards, NFC chips, unique device identifiers). Indeed, personalization of digital media is implicit in concepts like "the filter bubble" (Pariser, 2011), "the daily you" (Turow, 2011), or "monadic communication clusters" (Gergen, 2008). Each of these terms attempts to capture how contemporary media customizes our content and services, for example, through the embedding of algorithms that learn the habits of particular users (Mager, 2012). At the level of myth, the personalization inherent in IMDs like the BlackBerry suggests an intensified transformation of public space into private space; an expansion from connected places to connected people to connected everything; and thereby privileging consumer-centric

[21] For Tomlinson, the "coming of immediacy" also reflects a perceived fulfillment of Modernity's promise in which there are virtually no gaps between human desire and the fulfillment of that desire (2007, p. 74-75).

market mechanisms that ensure access to connected technologies and services (e.g., through the use of spectrum auctions).

Although each of these themes on their own is not entirely new or unprecedented, what is new is the scale of their configuration in the myth-making activities associated with a specific media artifact (the BlackBerry) and more broadly, as the combined appearance of a relatively new category of consumer technologies and services: IMD. Thus I focus on the BlackBerry as a case study, not to fetishize its significance, nor the brilliance and success of its corporate masters (RIM and its partners), but because it offers an ideal media artifact with which to historicize both the mythic dimensions *and* technological appearance of UC.[22]

1.2 Technics, Capacity, and the Political Economy of UC

In this dissertation, a political economy approach offers an opportunity to map interrelationships between the vested interests related to the creation of profitable commodities (and services) and the extraction and accumulation of surplus value. Furthermore, critical political economy helps place the development of ICTs within the productive and circulatory needs of capital. Discussing the development of wired

[22] Moreover, as this dissertation unfolds, these themes will offer an opportunity to signpost the connection between ontological and political economic questions related to the devices and services associated with the myth UC. *Ontological* because these devices are reflections of personal identity, occupation, and class—they are prospectively ubiquitous because they are meant to be affixed to the body and seamlessly embedded into the life and the rhythms of daily existence; *political economic* because it is the volatility of capitalist innovation and labour management, focusing on the intellective capacities of paid and unpaid labour that has made such ubiquity a material reality. These questions are further raised by the fact that, as mass produced consumer devices (and expressions of the logic of commodification), the ideal user is already subsumed in the design of the devices and available services. "To invent a new technology," writes Langdon Winner, "requires that (in some way or another) society also invents the kinds of people who will use it" (Winner, 1996, p. 64).

telephone and its changing user base in the early 20th century, Martin (1991) identified precisely this dialectic, linking it to passages in Marx' later works (*Grundrisse* and the three volumes of *Capital*) wherein

> [Marx] relates the development of means of communication to the process of circulation/exchange of capital. For him, there is no accumulation of capital without communication. Not only do the means of communication reproduce capitalist relations of production, but ever more rapid systems of communication are at the basis of an accelerated circulation and, hence, accumulation of capital. On the other hand, the desire of capitalists in the sphere of communication to make profit contributes to accelerate the development of systems of communication. Thus there exists a dialectical relationship between the processes of production and consumption of communication. (Martin, 1991, p. 307-308)

In a similar fashion, the evolution of IMD has evidenced a dialectical relationship between "the processes of production and consumption of communication" that is often punctuated by the real tensions and contradictions of the accumulation process. As I will describe in chapter 4, one of the primary early adopters of wireless connectivity and IMDs (and the BlackBerry specifically) was the financial industry (Cohn, 2002). Finance capital has always been an important economic category for capital, particularly as an area of activity associated with the creation and management of "fictional" capital formations (Harvey, 2010). However, with the creation of global digital networks, the expansion of multinational corporations (MNC), and the adoption of free trade policies allowing the expansion and acceleration of capital flows, finance capital is arguably the defining industry of post-Fordist capital (Harvey, 1989; McNally, 2011). Socializing these early users in the finance and banking industries to work under—indeed embrace—UC directly mirrored the specific spatial and temporal needs of this industry. Although the financial sector was a paradigmatic early adopter of IMD, the growing prominence of the "networked organization" as a strategic goal for policy makers, corporate executives, and management experts contributed to a broadening appeal of UC and the BlackBerry (discussed in chapter 6).

In waged labour (primarily non-unionized and/or "professional" designations), as technologies to maximize the intellective capacities—communicative, co-operative, cognitive (CCC)[23]—of paid labourers, these complex devices signify an increasingly precarious working arrangement. Not only are contracts shorter, requiring workers to be more flexible in terms of their scheduling and skill sets to keep up with industry changes, but the integration of these ubiquitous media have made work both more intensive and extensive for waged workers. *Intensive* because workers are now expected to accomplish more inside the "traditional time and space confines of their job." *Extensive* both because UC technologies have made it "easier for individuals to work longer hours" outside of these confines (Middleton, 2007, pp. 169-170) and because there are growing expectations by employers that workers will always be available. [24]

Innis' (1964) concept of bias conceptualized as *capacity* here provides a tool for

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[23] For a theoretical analysis of these capacities as they relate to information and communication theory see Hofkirchner, 2013.

[24] This is particularly true for workers in information-intensive industries (e.g., finance, media, technology), but also for "networked workers" across industries. See the Pew Internet & American Life Project study "Networked Workers" by Madden and Jones, 2008. http://pewinternet.org/Reports/2008/Networked-Workers.aspx

analyzing the relationship between dominant media and the specific articulation of CCC in so far as the former influence the articulation of the latter through time and space.[25] In this sense, the concept of capacity refers to an "index of potential" (Parker, 1985 p. 76) and maps a crucial intersection between ontological and political economic considerations as it entails, "analyses of the limitations and opportunities faced by people in their day-to-day lives and the factors that may influence them in any given place and at any particular time," implying that "physical and intellectual limitations and opportunities are both influential and dialectically related" (Comor, 1994, p. 111).

The specific articulation of CCC reflect not only the social settings and various media that allow the social subject to act, but actually orient the individual to the world; that is, they open up a set of potentialities—actions, thoughts, concepts, and values—that reflect pre-existing ways of living, relating, and thinking by active agents. Thus while the myth of UC suggests a new era of limitless or infinite social connectivity, foregrounding the specific technical mediation of intellective capacities highlights the *limits* or *constraints* shaped by a specific political economic milieu (which includes the habits of thought and action that are continuously produced and reproduced; Parker, 1985, p. 88).[26]

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[25] From the perspective of capital, CCC exist as intellective potential, as "a stand-in reserve of bits" (Barney, 2000, p. 207), which, through the expansion of networked devices in everyday life, also taps into unwaged time. Intellective capacities feed the acceleratory logic of informational capitalism by privileging (often contradictorily) the production and circulation of *dead* bits (Dyer-Witheford, 1999, p. 86) in order to render the living being more flexible and/or interchangeable. This mediation of intellective capacities is not neutral, nor unproblematic, but materially enabled and constrained by dominant media.

[26] Elaborating on the relationship between bias and capacity in bridging Innis' early work on Canadian economic history and his later work on the history of communication media, Parker writes that,

> [if] "bias" as limitation and direction of life is taken as synonymous with "capacity," then the whole of the economics of capacity and overhead costs become available as a means of analyzing the material preconditions of cultural production and institutional reproduction over time and space, and the foundation exists for the analysis of communications and empire and the "economic

Innis was concerned with how changes in communication—particularly its increasing technicity—changed the character of knowledge, and with it, psychic and social life. Thus insofar as communication technologies are linked directly to the articulation of human capacities, Innis' research leads us to address how these developments are paralleled in the search by dominant interests for ways to produce and reproduce their power. To the extent that dominant interests are able to accomplish (and sustain) this requires the co-ordination of technical advancement and prevailing myths. I argue the concept of bias (as capacity) helps critically analyze this co-ordination because for Innis the concept highlights that "changes in communication technology affected culture by altering the structure of interests (the things thought about), by changing the character of symbols (the things thought with), and by changing the nature of community (the arena in which thought developed)" (Carey, 1992, p. 160). This includes the specific way by which socially produced knowledge becomes both a "productive force and a relation of production" (Comor, 1994, p. 111). As basic indices of human experience and social organization, spatial and temporal dimensions are among the most essential and constitutive in Innis' critical history of communication media, though they do not exhaust the analytic utility of the concept of bias.

As an analytic framework, the emphasis on technics—referring to the interaction between available (or accessible) technical knowledge, resources, and infrastructure—

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history of knowledge," and hence the development of a self-reflexive historical-materialist epistemology. (Parker, 1985, p. 91) illustrates how biases shape the specific development and composition of dominant media.

Gilbert Simondon, prominent French engineer and philosopher of technics, writes that an individual technical object "is not a particular thing, given hic et nunc, but that from which it is born," its "technical being" can only become "the object of adequate knowledge only if that knowledge grasps the temporal sense of its evolution" (Simondon as quoted in Flichy, 2007, p. 111). The technical object has a genesis, a history. It exists as a specific unity, a historically contingent set of components drawn together. One task in this dissertation is to map how this process is constrained or catalyzed by political economic demands, technical advances, and myths. "The unity, individuality, and specificity of a technical object are those of its characteristics which are consistent with its genesis. The genesis of the technical object is part of its being" (Simondon, 1980, p. 18).

The technical object is the result of the conscious assembly of independent parts and capabilities and as such it is "a product of the interplay of recurrent causality between *life and thought* in man" (emphasis added, Simondon, 1980, p. 53). The object firstly acts as "the physical translation of an intellectual system" (Simondon as quoted in Flichy, 2007, p. 147) reflecting the incipient values, biases, and social relations of that system. As technical devices appear in commodity form, this process of translation is mediated by the (often contradictory) integration (or networking) of exploitable wage labour and markets. As such, the technical object highlights the limits within which political economic interests are able to act as a motive force in the development and mass adoption of a given technology.

It is from this perspective that we can understand how myth is implicated in the technical composition of a device since the design, user interface, and capabilities, already presuppose, and therefore project, an idealized user. Relative success or failure of a given commercial device might therefore be defined by how well technical features meet or mirror the existing expectations (and aspirations) of consumers.

To return to Innis vis-a-vis Carey, media are the cultural substrate ("the things thought with") that links the lived, everyday actions of individuals with broader social structures; dominant myths make readily available the symbolic glue ("the things thought about") binding individuals and social structures ("the arena in which thought developed"). The analytic focus on myth that this dissertation offers resists the postmodernist tendency to suggest the collapse or disappearance of "grand narratives" as indicative of the modern condition. Instead, myths are part of the material culture that makes up everyday life, as it has throughout human history. As Joseph Campbell explains, "The material of myth is the material of our life, the material of our body, and the material of our environment, and a living, vital mythology deals with these in terms that are appropriate to the nature of knowledge of the time" (Campbell, 1990, p. 1). From a comparative historical perspective, what changes over time and across societies is the specific media in which myths can be articulated and/or reproduced by actual individuals within social structures.

In the context of this dissertation, myth is also specifically important for understanding the popular conceptualizations of technological change (and capitalist political economy) beginning in the late 1960s resulting in a comparative explosion of fashionable "forecasts" about the future (Nye, 2007, p. 34); for example, the five volume report produced by the Commission on the Year 2000 (on which post-industrial theorist Daniel Bell worked) was published in 1968 (Mattelart, 2003, p. 83). Similarly, a report to France's then president Valery Giscard d'Estaing, "The Computerization of Society," provided a national policy framework forecasting the needs of the fully computerized society of the future (Nora & Minc, 1980). Since the early 1970s, the evolution of global capitalism has been accompanied by an expansion of available forecasts about the future produced by think tanks, "experts," politicians, and government institutions (Mattelart, 2003, p. 83). Taken together, I consider these contributions to be an expanding "constellation" of myths associated with the economic, political, and technological changes beginning after 1945, of which UC, among others, is only one contemporary contribution.[27]

The proliferation of myths during this period is not accidental, but rather expresses at a cultural level the structural dialectic of forces and relations of production that animate the networking of a global capitalist economic system. It is in this sense that, as Lewis Mumford asserts, with great transformations in technics comes "a change of mind" (Mumford, 2010, p. 3). He writes,

> To understand the dominating role played by technics in modern civilization, one must explore in detail the preliminary period of ideological and social preparation.

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[27] Darin Barney (2004) notes that James Beniger's *Control Revolution* (1986) identified "seventy-five appellations in scholarly and popular circulation between 1950 and 1985, each of which attempted to characterize what were perceived to be definitive transformative aspects of the period" (p. 4). As already noted, I chose to emphasize "post-industrial" as a genre in which subsequent names might be categorized (e.g., "Information Society" or "Network Society"). The pervasive competition to offer up names that effectively capture the "spirit of the age" has itself become a defining aspect of the decades after WWII, and thus what future historians might consider to be expressions of "the Age of Nomination" (Barney, 2004, p. 4).

> Not merely must one explain the existence of the new mechanical instruments: one must explain the culture that was ready to use them and profit by them so extensively…No matter how completely technics relies upon the objective procedures of the sciences, it does not form an independent system, like the universe: it exists as an element in human culture and it promises well or ill as the social groups that exploit it promise well or ill. (Mumford, 2010, pp. 4-6)

In an era often characterized by proponents of one or another explanation for the rapid proliferation of ICT in everyday life, the relative success of a given myth in preparing a culture to accept (or adapt to) profound technological change is contingent, at least partly, on the conceptualization of users and capabilities that ground the myth in everyday life. For example, the myth of UC, for those able to participate, offers a real technically enabled and mediated experience of the myth itself. Thus the commercial development of end-user devices involves their design as commodities readily slotted into the myth-making functions of marketing and advertising practices. Commercial interests must not only create useful new technologies, "but also compelling narratives about how these new devices will fit into everyday life" for the sake of appealing to consumers as well as to secure venture capital, return on investment, and profitability (Nye, 2007, p. 36). Indeed, as I argue in chapters 7 and 8, the conjoined rise of web 2.0 and the ascent of the prosumer influenced the evolution of UC and IMDs.

1.3 Overview of Chapters

Using the story of the BlackBerry and RIM as a case study, this dissertation employs myth to analyze the technical and commercial development of UC in three stages: 1) the commercialization of wireless data in North America, 2) the creation of mobile workforces and virtual enterprises as emblematic of a "new economy," and finally, 3) the influence of web 2.0 and the rise of the prosumer (as an ideal user of IMDs). In this final pivot, IMDs become platforms for developing new revenue streams for content producers, software developers, advertisers, and telecommunications providers. I extend these considerations beyond the BlackBerry in the concluding chapter.

In chapter 2, I situate my research within broader literature dealing with the political economy of media and technological change, and the utility of myth for analyzing the rise of both UC and IMDs. The purpose of this chapter is to highlight key considerations related to my use of myth and its application in this dissertation. This chapter develops my specific use of myth as it relates to a critical political economy of media framework. In this chapter I map this conceptual framework through which myth is related to other central analytic concepts that will be employed in later chapters.

Chapter 3 outlines the antecedents for the development and initial success of the BlackBerry. I historicize this development within a continuum of prior consumer devices, standardization, and patents, thereby framing the development of UC and IMDs in terms of key technical, political economic, and cultural barriers that shaped the early development of the BlackBerry. In this chapter, I use the concept of myth to frame the technical and commercial drive for wireless data services and devices. These failed commercial attempts created the condition by which the myth of UC was adopted and articulated through the BlackBerry brand.

In chapter 4, I focus specifically on the BlackBerry as a "solution" to the problem of commercializing wireless data and services faced by telecommunications providers in North America. I demonstrate how RIM's development of the BlackBerry highlights an institutional embrace of UC—involving strategic partnerships, technical proficiencies, corporate and brand identity, and product design. To illustrate how RIM's institutional development manifests the myth of UC, I offer a detailed description of the development of its brand of devices and services, linking this evolution to a wider shift in the conceptualization of dominant users, and the development of a global market for UC.

Chapter 5 contextualizes both the BlackBerry and its organizational creator, RIM, within a broader policy environment adapting to a changing provincial and national economy. I demonstrate how this policy environment was built upon myths regarding the relationship between labour, technology, and investment within the "new economy" in both Ontario and Canada. I draw parallels between the policy myths associated with a rethinking of the productive place of CCC in the management of labour and RIM's success in commercializing UC.

In chapter 6, I describe the rise of "mobile workforces" and "virtual enterprise*s*" as managerial responses to both the myths associated with UC, and ultimately, its commercial realization in the form of the BlackBerry. This chapter suggests that these developments laid the necessary foundation for the economies of scale that were essential to the early success of the BlackBerry as a technology for labour management. In this chapter, the myth of UC is manifested in management literature and organizational strategies emphasizing connected workforces. I trace the conceptualization of connectivity in labour management literature and explain the incorporation of UC as a strategic goal that enabled the widespread adoption of BlackBerry devices and services.

Chapter 7 situates the specific evolution of the BlackBerry within this consumerization of UC and IMDs. It highlights the influence of both web 2.0 and the prosumer (as a different type of user) in shaping the technical development and marketing of the devices beyond their adoption by commercial enterprises. In this chapter I examine how RIM attempted to leverage its successful commercialization of UC in order to appeal to a wider audience of potential consumers now socialized to engage in digital prosumption through UC as both a branded experience and lifestyle.

In chapter 8, I conclude by offering reasons why the BlackBerry has been displaced by competing platforms, and what this means regarding the commercialization of UC. I close my discussion with some projections about UC and questions concerning the ethics and democratic politics of the future.

Chapter 2 – On Myth, Media, and Power: Situating the Research

"What does 'technology' mean?...modern technology is a mystifying term which describes the ongoing capitalist system, nothing more. In fact, the idea appears to be nonpolitical although, in reality, it is one of capitalism's most potent propaganda weapons in the struggle between the rich and the poor nations and the rich and the poor within nations." (Smythe, 1981, p. 20)

2 Situating the Research

In this chapter I will situate my dissertation project within existing critical research literature. What I offer is not an exhaustive review, but a triangulation of concepts and theorists probing the interrelationship between myth, media, and power. In this chapter I not only want to situate my research, but also want to clarify key concepts, their utility, and complementarity. First, I develop the concept of myth in relation to political economy; second, I discuss the conceptual similarities and differences between myth and ideology; third, I discuss the importance of myth and critical political economy for analyzing media; fourth, I articulate theories of post-industrial capitalism as myths that specifically highlight the role of ICTs; and in the final sections, I narrow my discussion to focus on the role of political economy and myth in the evolution of IMDs. I conclude with a brief summary of my overall approach.

2.1 On Myth

Arguably, it is because myth is such an essential component of human social organization that its utility as an analytic category is prospectively rich. Highlighting myth in an era of seemingly technological abundance foregrounds the continuity, indeed, the homology, between so-called "advanced" and "primitive" cultures. Each culture has (and is constituted by) myths that organize collective values, shared institutions, traditions, and hierarchies. In general, the realm of mythos offers an "assertive discourse of power and authority that represents itself as something to be believed and obeyed" (Lincoln, 1999, p. 17). Myths encapsulate the symbolic resources that enable identities, models of community, patterns of agency, and explanations of social change that contribute to the stability (or instability) of a given community through time and space. Moreover, myths integrate the myriad of political economic forces and institutions into a shared vision of society. "Myths work by demonstrating order. They are true in the sense that they are satisfactory demonstrations or representations of a perceived order and are therefore often believed by a society to be more or less factual" (Ausband, 1983, p. 5).

Myths are therefore an inseparable part of any community because they provide the symbolic glue that gives such communities a common purpose and destiny. To reference Nietzsche (1956, 1969), myths transmit a culture's "table of values." Like Nietzsche, I argue that dominant values are an expression of power structures. The utility of myth as an analytic tool therefore helps capture the "system of axioms and postulates defining the best possible code, capable of conferring a common significance on unconscious formulations which are the work of minds, societies, and civilizations chosen from among those most remote from each other" (Levi-Strauss, 1970, p.120).

The analysis of myth, however, engenders methodological problems since its perceived unity is a product of the researcher's imagination: it is both "tendential" and "projective" (Levi-Strauss, 1970, p. 5). Levi-Strauss asserts that it is best to consider the product of mythic analysis as "anaclastic," based on the "etymological sense which includes the study of both reflected rays and broken rays" (1970, p. 5). The study of myth therefore involves identifying both points of convergence and divergence of "sequences and themes" (p. 5), moments of synchronicity and/or collapse. Levi-Strauss' approach to studying the influence of myths on a given culture is analogous to mapping the "irradiation" of refracted light. Building on this analogy, he writes that,

> by measuring the directions and angles of the rays, we are led to postulate their common origin, as an ideal point on which those deflected by the structure of the myth would have converged had they not started, precisely, from some other point and remained parallel throughout their entire course…this multiplicity is an essential characteristic, since it is connected with the dual nature of mythological thought, which coincides with its object by forming a homologous image of it but never succeeds in blending with it, since thought and object operate on different levels. *The constant recurrence of the same themes expresses this mixture of powerlessness and persistence. Since it has no interest in definite beginnings or endings, mythological thought never develops any theme to completion: there is always something left unfinished. Myths, like rites, are "interminable."* (emphasis added, Levi-Strauss, 1970, p. 6)

As a mode of thought and speech, myth, or *mythos*, can be contrasted with *logos*. Whereas logos often involves speech acts wherein individuals "observe the world and formulate ontological statements in theory, formulas, and definitions" thereby inviting rational analysis and seeking "situation-independent validity," the realm of mythos emphasizes attempts to "interpret and explain human reality and human experiences" in the form of stories or narratives (myths) (Foerst, 2005, p. 489-490).

> A mythos interpretation of reality, contrary to a logos interpretation, is presented in an authoritative fashion and cannot be a topic for rational analysis and discussion. The authority and the language a myth uses depends on the time and the culture in which it is told; the authority can be an official of a religion, a politician, one's family, or even oneself. But whatever authority is accepted as the mythos provider, the act of acceptance is not a solely rational one but contains an element of commitment. (Foerst, 2005, p. 490)[28]

There is, however, an element of contingency in how a given myth impacts the thoughts and actions of an individual: "Every mythos speech act is therefore always a result of a very concrete situation in which a person finds himself; it is a result of development, chance, and the interaction of the person and his environment (especially his culture) (Foerst, 2005, p. 490). In summary, Foerst writes, whereas the realm of logos answers questions of "how," the realm of mythos provides answers to questions of "why" (Foerst, 2005, p. 491).

More tangibly, myths offer a point at which to understand the "constraining structures of mind" and action (Levi-Strauss, 1970, p. 10). In this respect, myth can help understand the convergence (and divergence) between the behaviour of situated actors and wider social collectivities (for example, consumers and markets, or citizens and government).

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[28] This conceptualization of mythos is similar to Francis Bacon's "idols of the mind." Bacon's concept refers to the "prejudgments that humans make based on such things as cultural background, language, and theoretical commitments" (Sargent, 2012, p. 83) some of which are innate and "rooted in the very nature of the intellect" (Bacon, 1620, p. 35). As Bacon suggests, the unreflexive adherence to such idols throughout human history has acted as a powerful obstacle "to the advancement of knowledge and the implementation of objectivity in the sciences" (Zagorin, 2001, p. 386).

Although I am deeply sympathetic to Levi-Strauss' conceptualization of myth, which emerged in the context of structural anthropology,[29] my study uses the term specifically within the context of critical political economy. In this study, political economy is the prism through which the "rays" of myth are refracted into the realm of symbolism and culture, subsequently converging upon material artifacts. In this case these material artifacts (in this case IMDs) are with growing rapidity deemed—by technologists, corporations, governments, and consumers themselves—to be the communicative staples necessary for the reproduction of the social individual (and labourers). In fact this process of refraction and convergence captures the historical reflexivity between political economic interests and communication technology. It is perhaps for this reason that the analysis of myth remains both "elusive and protean" for theorists like Levi-Strauss and Mauss (Strenski, 1987, p. 152), theorists that do not directly engage in political economic analyses of media.

2.2 Myth and Political Economy

In his sweeping study of the cyclical waxing and waning of Western civilization(s), Innis has demonstrated (1964, 2007) that changes in information and communication media can realign the spatial and temporal biases that influence long-term economic, political, and cultural stability. Neil asserts that, "In the Innisian scheme of things civilization is the organization of values" (1972, p. 95). I argue that bias (as

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[29] Levi-Strauss' theory of myth is by no means universally accepted and has engendered numerous critiques from fellow anthropologists and social scientists (see Bourdieu, 1990; Lizardo, 2010; Strenski, 1987). As a seminal figure in the study of myth, particularly from the perspective of media studies, his work is foundational to understanding later uses of myth in cultural studies, particularly in the work of Roland Barthes.

capacity) offers a concept suited to critically examining the contextual role of myths—questions of "why"—as they animate social subjects and structures. Left unchecked, these biases contribute to the formation of monopolies of knowledge and thereby reinforce (or undermine) power asymmetries within and across empires. Innis developed the concept of bias to historically assess and compare the influence of values on the situated actors and their institutions from different epochs. Reflecting Innis' central premise, Winner notes that the long-term evolution of ICTs demonstrates that "certain devices and systems are almost invariably linked to specific ways of organizing power and authority" (Winner, 1999, p. 34). Examining the path such technologies take in their colonization of everyday life offers valuable insight into one of one of Innis' primary concerns—"why do we attend to the things to which we attend?" (Innis, 1964, p. xvii).

Following Innis, it is important to always consider how broad transformations in the media of everyday life might influence how we conceptualize the most basic indices of human existence: time and space, self and society, past and future, actuality and potentiality. As the myth of connectivity and communicative empowerment through consumer technologies continues to take greater hold in everyday life (see Turkle, 2012), our decision-making capacities are increasingly tuned to the flows that constitute our expanding information ecology. The interplay between myth and technological change is materialized in an expanding bundle of ostensibly "necessary" consumer devices and services. From the perspective of media-centric research, this interplay is analytically interesting precisely because it clearly links the tools (media) and values (myth) that shape the actions of social subjects within given social structures. Importantly then, myths provide symbolic structures regulating the ideas and values surrounding technology, thereby framing both their commercial and practical utility. Myths, as Mumford writes, shape "how we think about technology" (1970). This is significant because at the level of individual action, myths are participatory; they offer stories in which individuals assume a place. In framing social progress and technological change, myths offer a cosmic order providing "'euphoric clarity' by eliminating complexities and contradictions" (Mosco, 2004, p. 30).

Given that technological innovation plays such a historically central role in sustaining the forces and relations necessary for the accumulation of capital, technology has become a highly mythologized part of capitalist culture. This mythologizing of technology is totalizing in scope, spanning not only the individual consumer, but also the "productive" consumption associated with the production of surplus value (Marx, 1976, pp. 716-724). This is largely due to the structural need for accelerating technological innovation stemming from market competition. Under conditions of generalized commodity production, concepts like those associated with post-industrial capitalism (e.g., "the creative class"), are products of a systemic capitalist tendency to mystify the relationship between fixed capital and variable capital.[30] This mystification, for example through concepts (and related "keywords") such as the "network" economy, conceals the real source of capital's self-augmentation—i.e. the conversion of socially necessary

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[30] In Marx's terminology, "fixed" or "constant" capital refers to the costs associated with (and value accumulated in) the "instruments of labour" comprising tools, machines, and essential infrastructure, while "variable" capital refers to the costs associated with the purchase of labour power (which can vary historically). While the former only transfers value to the commodities produced, the latter is the source of value creation. See Marx, 1976, pp. 307-319; and Harvey, 2006, pp. 204-208.

labour time into accumulated surplus value—by valorizing technological change (Harvey, 2006, pp. 133-136).[31]

Part of what defines capitalist myths is precisely their role in extending commodity fetishism to encompass culture itself. As Heirnrich (2012) explains, Marx's development of commodity fetishism was used to describe how the real social relations of capitalist production are hidden (or kept "secret") by what appears as autonomy amongst commodities exchanged in the market (pp. 70). What stands-in for the "truth" of exchange is a set of idealizations (which I will collectively refer to as myth) that naturalize the exchange value (thus price) of a given commodity without recourse to the labour and/or social relations of production. Furthermore, the concept of the fetish—which Marx appropriates from Eurocentric ethnologists and economists seeking to understand the structures and social relations of "primitive" cultures (Marx, 1972) – demonstrates that even in capitalist societies (so-called "advanced" European cultures) myth plays a key role (Taussig, 1980).

Marx does not use the term "myth" in an explicitly systematic way, though he does implicitly deploy it in understanding the beliefs and values animating bourgeois political economists. For example, this is evident in Marx's reference to the importance of Robinson Crusoe and the Robinsonades (Marx, 1973, pp. 83; Marx, 1976, p.169), his discussion of the "eternalization of historic relations of production" (Marx, 1973, p.85) as well as in a section entitled "The Method of Political Economy" from his *Grundrisse*

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[31] Harvey (2006) writes that the technological dynamism is a "prime lever for furthering the accumulation of capital through perpetual increase in the value productivity of labour power" (p. 133). One of the key contradictions arising from this process is the substitution of value-creating labour by an excess of "fixed" capital (pp. 133-136).

(Marx, 1973, pp. 105-106, p.110).[32] Marx also makes frequent reference to the "mystical" characteristics of bourgeois political economic categories (Marx, 1976, p. 164, p. 680; Marx, 1981, p. 966), as well as to the processes of "mystification" that conceal capitalism's real social relations to both the bourgeoisie and workers (Marx, 1976, p. 729-730, p. 1052; Marx, 1973, p. 640-641; Marx, 1981, p. 123-125, p. 267-269, p. 516, p. 965).

Processes of mystification—particularly those that exploit systemic inequalities, as captured in the concept of commodity fetishism—create fertile ground for myths to gestate or germinate. The fact that Marx introduces the concept of commodity fetishism in the first chapter of his most important work arguably signals the importance of myth to the critical analysis of bourgeois political economy and its economic categories. It also anticipates the "magical system of commodities" created by the marketing and advertising industries (Williams, 2000). Mystification is a prelude to mythic thinking.

Consider Marx's opening discussion in the chapter from *Capital Volume 1* entitled "The Secret of Primitive Accumulation." The "secret" prehistory of capitalism, indeed, its very origin, is concealed by an "anecdote about the past" explaining that, "Long, long ago there were two sorts of people; one, the diligent, intelligent and above all

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[32] Anticipating Innis, Marx likens the analysis of myth to the development of critical and reflexive capacities: "Likewise, bourgeois economics arrived at an understanding of feudal, ancient, oriental economics only after the self-criticism of bourgeois society had begun. In so far as the bourgeois economy did not mythologically identify itself altogether with the past, its critique of the previous economies, notably of feudalism, with which it was still engaged in direct struggle, resembled the critique which Christianity leveled against paganism, or also that of Protestantism against Catholicism" (Marx, 1973, p. 106).

frugal elite; the other, lazy rascals, spending their substance, and more, in riotous living" (Marx, 1976, p. 873). Like "the legend of theological original sin,"

> the history of economic original sin reveals to us that there are people to whom this is by no means essential…
>
> Thus it came to pass that the former sort accumulated wealth, and the latter sort finally had nothing to sell except their own skins. And from this original sin dates the poverty of the great majority who, despite all their labour, have up to now nothing to sell but themselves, and the wealth of the few that increases constantly, although they have long ceased to work. Such insipid childishness is every day preached to us in the defence of property…
>
> In actual history, it is a notorious fact that conquest, enslavement, robbery, murder, in short, force, play the greatest part. (Marx, 1976, p. 873-874)

As the commodity form comes to mediate both culture and economy, the fetish entails an explanatory void, which systemically challenges the possibilities for reflexivity about the material practices and social relations that define the reproduction of everyday life (e.g., wage labour). In relation to the fetish of commodity production, this void is filled by prevailing myths as both conceptual and lived reality, thereby obscuring the reality of the (exploitative) social relations that defines daily existence. As a symbolic framework enabling or constraining the actions of individuals, myths are lived and therefore are central to identifying the beliefs that animate, motivate, and sometimes undermine, the vested interests of social groups (and open up opportunities for resistance).[33]

The rise of mass communication technologies as popular entertainment media arguably has created greater homogeneity in the dissemination of available myths but it also has enhanced their malleability and utility on behalf of political economic interests. Capitalism therefore is especially dependent on the industrial production of explanatory myths (provided through some combination of think tanks, experts, pop culture intellectuals, and marketing and advertising firms; see Goldman et al., 2006), particularly those that emphasize the transformative power of technology. In this context, myths act as both the *content* and *form* of representing reality through the capitalist media system. As “a system of communication” or “mode of signification” (Barthes, 1957, p.109), capitalist myths are specifically “dependent on the representation which the bourgeoisie has and makes us have of the relations between man and the world” (Barthes, 1957, p.140).

Myths thus are used to make sense of, for example, technological and corporate convergence by explaining such change in familiar terms like progress, efficiency, convenience, innovation, and consumer utility. As Babe explains,

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[33] For this reason, massive investments in new technologies, particularly ICTs, by corporations seeking competitive advantage (whether under the auspices of enhancing the productivity of labour, enhancing the control and management of labour, or accelerating the distribution and consumption of commodities) can lead to waste, and often, failure (for example, see my discussion of Apple’s *Newton* in chapter 3 and my assessment of RIM’s market troubles in the concluding chapter). Corporate investment in new infrastructure (fixed capital) often involves a calculation of risk and uncertainty built upon a faith in the competitive advantage provided by new technologies.

> Mythologizing ‘technology’ serves well the interests of both government and industry. Mythologizing ‘technology’ transforms conscious acts (frequently entailing billions of investment dollars, tax write-offs, and subsidies) into the mythically ‘inevitable’ and ‘natural’ order of things. Moreover, mythologizing ‘technology’ obscures the locus of responsibility, no small advantage for those who deploy advanced techniques; after all, how can anyone be held responsible for the inevitable? Finally, mythologizing ‘technology’ sweeps aside debate concerning the distribution of power domestically and internationally and the utilization of communication media towards those ends. Myths of communication ‘technology’ thus inform us that nothing is selected, nothing chosen. Rather, all one has to do is to possess these new devices from which all soiling trace of origin and choice has been effaced. (1990, p. 257)

The rapid proliferation of mobile technologies in everyday life and their invisible or magical powers provides a particularly rich example of this process. Choices made by corporations and governments early in the development of a new technology are significant for the longer term development and potential of such technologies because, as Winner explains, “choices tend to become strongly fixed in material equipment, economic investment, and social habit, the original flexibility vanishes for all practical purposes once the initial commitments are made” (Winner, 1999, p. 32). Winner’s comments capture an important and oft cited concept in technology studies: *path dependency* (Fagerber et al., 2009; Fuchs and Shapira, 2005; Schienstock, 2011). This term refers to the fact that early strategic choices, investments, innovations, and decisions create a kind of momentum or dependency that makes deviating from these early considerations, over time, often more difficult. The QWERTY keyboard offers a paradigmatic example of path dependency (David, 1985).[34] Another example is the triumph of VHS over its rival, BETA, despite its inferior quality (Liebowitz and Margolis, 1995).

Thus both the capitalist and worker/consumer can be caught up in the same myth, and as such, both be guided by the idealization of specific values and/or goals that misrepresent, distort, or conceal the real historical and material conditions. This is largely because myth naturalizes the social relations that underpin technological change and diffusion. The increasing technical composition of *connectivity* itself accelerates a tendency towards the reproduction of social relations through "telemediated" experiences (Tomlinson, 2007). As a commercial goal, *ubiquitous connectivity* is itself an expression and material manifestation of the general idealization of the forces and relations associated with the realization of any number of post-industrial futures (a topic more directly explored in Chapters 5 and 6).

To reiterate, myths are an essential component of all human societies. They are pervasive in the meaning-making process that allows individuals to make sense of themselves, their place in society, their specific possibilities for social action. The question then becomes why some myths take root at particular historical moments and not others. In the context of the crisis prone tendencies of capitalism, myths flourish

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[34] In the case of QWERTY, path dependency also captures a cognitive expression in the mental and muscle memory that enables effective use.

during periods where in widespread technological change coincide with re-organization of the social relations of production.

Mattelart (2003) and others (as examples, see Babe, 1990; Mumford, 1970; Webster and Robins, 1999; Marx, 1964) have outlined in various contexts how myths have been associated with widespread technological change (and associated policy frameworks). These myths serve a political and economic role in privileging certain perspectives and interests over others—typically those of economic efficiency trump those of social progress. Commercially driven contemporary myths place value on constant connectivity, mobility, high quality video, and convenient information search and retrieval capabilities. In the process of determining these values, dominant technologies such as the Internet are weaved into broader cultural myths that convey more than just their instrumental uses. Such technologies also are imbued with transformative—and often transcendental—qualities that speak to both human (including community, autonomy, empowerment) and economic (productivity, efficiency, competition, profitability) needs.

For some theorists, challenging (or not challenging) established myths hold dire consequences. For example, Mumford's dystopian view (1970) of society and technology stemmed in part from a belief that Western society was largely unable to become reflexive about the myths that give technological systems seemingly a life of their own beyond human control or intervention. Resisting this dystopian impulse, however, requires a rigorous program of historicizing and de-mystifying dominant myths.

2.3 Myth and the Ideology

"Once the Saint-Simonian church had been dissolved and the grand visions of the militant period had ended, Saint-Simonism was content to express a managerial thinking before its time and symbolized the spirit of enterprise of the second half of the nineteenth century. The ideology of redemption through networks, seen as creators of a universal bond, legitimized managerial positivism. The new entrepreneurs of industrialism laid the foundations of international networked space by creating railway companies and shipping lines, founding credit institutions, and building canals between oceans." (Matterlart, 2000, p. 17)

"Behind the myth of the Information Society there is the reality of growing commercial and political exploitation of social knowledge and information." (Webster & Robins, 1999, p. 128)

In discussing the transformation of French philosopher Claude-Henri de Saint-Simon's utopian and, indeed, religious, view of networks into a "legitimized managerial positivism," Mattelart (2000) captures the interrelationship between myth and ideology. Saint-Simon's model of a network society administered by "industrialists" where human beings were managed by "positive knowledge" was itself a product of the great social, political, and economic upheavals associated with the French Revolution (p. 15). The Saint-Simonian church, founded by devotees shortly after Saint-Simon's death, advocated an idealized version of a network society, a "circulating civilization" (p. 16). Preceding the widespread use of steam engines for rail and sea, Saint-Simon's follower Michel Chevalier advocated the view that networks of communication and commerce played an essential role in strengthening "cohesion in the social organism," and that they "necessarily" promotes "equality and democracy" (p. 16-17). As Mattelart (1996) documents, Chevalier expressed these beliefs publicly by promoting (through books, newspaper articles, and policy recommendations) investments in road, rail, and other "network" infrastructure by both the French government and French capitalists (pp. 100-104).[35] The end goal for Saint-Simonians like Chevalier was the creation of "Universal Association," a global human society whose harmony was enabled by the networks of commerce and communication (pp. 100-104). These Saint-Simonian myths would not only later provide justifications for the internal spread of "managerial positivism" but also for the essential connection between the religious and economic goals associated with massive investments in transportation infrastructure.[36]

The above example illustrates the essential relationship between myth and ideology as the former enables the latter to be enacted at specific historical moments. My distinction between myth and ideology is in their emphasis and scope as they relate to the actions of individuals or groups within specific political economic structures (and dynamics). Ideology concentrates on what we think about; the contents of consciousness, the ideas it contains, and how these ideas are or can be deployed politically. Thus, as Thompson succinctly explains, ideology refers to "meaning in the service of power" regularly serving to "establish and sustain relations of power which are systematically asymmetrical" (Thompson, 1990, p. 7).

Though I do not employ the concept of ideology in this dissertation, it is worth addressing this conceptual distinction in order to further clarify my use of myth. As Terry

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[35] Chevalier would later promote the creation of a "Mediterranean system" created through regional economic and cultural integration enabled by new communication and transportation technologies (Mattelart, 1996, pp. 104-105).

[36] In a 1832 article published in *Le Globe*, Chevalier writes: "If, as we are assured, the word religion comes from *religiare* ["to bind fast"], railways have more relation to the religious spirit than we think. Never has there existed an instrument of such power to link together scattered people" (quoted in Mattelart, 1996, p. 103).

Eagleton (1991) notes there is a close connection between the critical use of myth and that of ideology, though it is not easily discerned (p. 188). “Both myth and ideology are worlds of symbolic meaning with social functions and effects; but myth is arguably the more capacious term, revolving as it does on the great ‘metaphysical’ questions of birth, sexuality and death, of sacred times, places and origins” (p. 188). Eagleton suggests that myth expresses “a particular register of ideology, which elevates certain meanings to numinous status” (p. 189). In Eagleton’s conceptualization, myth can offer metaphysical or idealist *weight* to those championing a particular ideology within a specific political economic milieu. In this respect, we can think of the post-industrial myths of “creativity,” “knowledge,” “information,” and “networks,” as expressing such numinous associations. When such keywords (and their mythic *armature*[37]) are, for example, mobilized in the service of justifying new labour policies associated with telework their articulation can be considered to be ideological, and thus directly express (and expose) the use of specific ideas in the service of power (as Thompson describes it). “Myths may not legitimate political power as directly as ideologies, but in the manner of Pierre Bourdieu’s doxa[38] they can be seen as naturalizing and universalizing a particular social structure, rendering any alternative to it unthinkable” (p. 188). As Eagleton writes, “A myth is not just any old falsehood: we would not describe as a myth the claim that Everest can be scaled in

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[37] I use the term armature here as a dual metaphor referring to the symbolic *armor* associated with these terms, but also referring to the component of an electric machine activated when an “electromotive force is induced,” for example by way of a magnetic field (*Webster’s Unabridged Dictionary*, “armature”). In this second meaning, myths (and the values therein) are *activated* and propagated by individuals in specific contexts. To the extent that such individuals (and their respective institutions) have the power to substantively affect political and economic decisions, thereby disproportionately (or unilaterally) affecting the lives (and life chances) of other less privileged individuals, such myths become ideological.

[38] Bourdieu uses the term doxa to mean, “an adherence to relations of order which, because they structure inseparably both the real world and the thought world, are accepted as self-evident” (1984, p. 471).

forty minutes at a brisk trot. To qualify as mythical, the belief would have to be widely shared and reflect some significant psychological investment on the part of its adherents (p. 188-189). As process, mythologizing requires “the element of idealization” (Eagleton, 1991, p. 189), a point that resonates with Marx’s critique of bourgeois political economists and their economic categories. “Mythical figures or events are those imbued with an aura of specialness: they are privileged, exemplary, larger-than-life phenomena which distil in peculiarly pure form some collective meaning or fantasy” (Eagleton, 1991, p. 189).

Because of the necessity of ongoing technological innovation to capitalist accumulation, versions of techno-utopianism often present a future dependent on the persistence of capitalist social relations like private property ownership and free market competition (for example, in versions of the future depicted at the *World’s Fair* like GM’s “Futurama” exhibits in 1939 and 1964).[39] As already noted above, the power of these utopian myths rests in their ability to continually marshal the entrenched enlightenment (or modernization) values of freedom, liberty, and democracy (Mattelart, 2000, 2003).

Reflecting upon the seemingly eternal recurrence of enlightenment values grafted onto each successive wave of new technologies in relation to their strengthening of bourgeois ideology, Mattelart writes:

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[39] GM’s 1939 Futurama film: http://www.youtube.com/watch?v=1cRoaPLvQx0; GM’s 1964 Futurama film: http://www.youtube.com/watch?v=2-5aK0H05jk

> Each new generation of technology revived the discourse of salvation, the promise of universal concord, decentralized democracy, social justice and general prosperity. Each time, the amnesia regarding earlier technology would be confirmed. All these methods—from the optical telegraph to underwater cable, the telephone, the radio, the television and the Internet—intended to transcend the spatial and temporal dimensions of the social fabric, brought back the myth of the recovery of the lost agora of Attic cities. (Mattelart, 2003, p. 23)

While myths help project these sentiments onto new technologies they also often conceal vested interests embedded in the very development and application of such technologies. As such, myths can frame the organizational structure and identity of commercial entities—what du Gay et al. (1997) call the "culture of production"—comprising the shared values, beliefs, patterns of work and innovation that constitute a coherent corporate vision. Such interests are manifested in product design, standardization, network architecture and relative neutrality, access points and coverage, coding, and technical specialization, skills and know-how. For example, the economic and social demands propelling consumers to willingly (and honestly) volunteer personal information has become an important new element shaping the development of consumer technologies and media content because of its purported commercial value (Gandy, 2003; Turow, 2006, 2011). *Of particular interest and relevance to this dissertation are myths that promote the valorization of consumer participation or empowerment, and more recently, what is called user-generated content (UGC).*

This project contextualizes a novel addition to an existing mythic tradition by focusing on the packaging and sale of mobile devices and services as a means of accessing the benefits, whether economic or social, of ubiquitous connectivity. Mobility invokes the empowering and democratic rhetoric of web-related myths emphasizing individual agency over space and time (Ishii, 2006). In so doing, these devices expand the range of commodifiable social practices through their mediation by digital devices and services. Moreover, UC reflects the potential for new ways in which labour itself can be conceptualized as an abstract commodity, particularly in relationship to the growth of "flexible work arrangements" associate with an increasing number of labour contracts.[40] This includes the growth of self-employed part-time or short-term contractual arrangements associated with outsourcing associated with the "network" organization (Castells, 1996). The related rhetoric disguising these patterns emphasizes the cause of "progress" offered by introducing new ICTS to ameliorate social conditions. For example, world-wide-web creator Tim Berners-Lee's "Mobile Web Initiative" was directed at the "digital divide" separating information rich from the information poor. Another related project is the "One Laptop Per Child" (laptop.org) initiative. It is still unclear if such approaches to "development" can truly deliver the lofty aims forwarded

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[40] Georgetown University Law Center's report on workplace flexibility, using U.S. Labor department statistics, notes that, "In 1985, 12.4% of the working population worked on a flexible schedule, compared to 27.5% in 2004" (2010, p. 1). They define "flexible work arrangements" as those which emphasize flexibility in *scheduling* of hours worked, in the *amount* of hours worked, and in flexibility in the *place* of work (p. 1). Though not conclusive, the report includes survey data indicating a growing interest (80%) on the part of workers for more "flexibility" in their working arrangements provided there were "no negative consequences" (p. 1). Indeed, global employee placement companies like Manpower thrive on the expansion of flexible arrangements of this sort (Manpower, 2010). The disparities between how employers and employees conceptualize "flexibility" and "negative consequences" seems a worthwhile area for studying how the myth of UC is made ideological, particularly since most "businesses provide flexible work arrangements on an informal or individual basis" (p. 5). Trends towards more "flexible," that is, "precarious," work are evident elsewhere. A recent report by the Poverty and Employment Precarity in Southern Ontario (PEPSO) research group indicates that "20% of those working are in precarious forms of employment" and that the "this type of employment has increased by nearly 50% in the last 20 years" (PEPSO, 2013, p. 5). Moreover, the report states that, "Across Canada, the category of 'self-employed without employees' increased almost 45% between 1989 and 2007" (p. 6). Though not addressed in this dissertation, this trend suggests future research along these lines.

by Berners-Lee, Bill Gates, Al Gore, or by the corporate marketing campaigns that often appropriate such goals for commercial gain.

As inspiring or hopeful visions of the future, myths are particularly instrumental in times of economic or social uncertainty because they can act as powerful tools for mobilizing public and private support for a given cause.[41] Linking the values of democracy, community, and individual autonomy to readily available consumer technologies, post-industrial myths offer the promise of personal and social transcendence. Thus myths play an important role in shaping public opinion in favour of some interest groups over others and thus can be deployed to contextualize ideological initiatives. They can aid in winning popular support for massive technical systems often by paying an "enormous price for their promises in lives and resources sacrificed to realize impossible dreams" (Mosco, 1998, p. 58). As such, artifacts produced under conditions of generalized commodity production not only become vehicles for the circulation of myths, but also their technical and material expression. This approach reflects Marx's more general analysis of the commodity and commodity fetishism, and the demystification provided through the "logical mapping of the interrelations and movement of the categories that the object offers up as markers of its immediate intelligibility" (Best, 2010, p. 71). On this methodological point, Beverly Best elaborates,

> For example, an exchange economy offers up certain categories of intelligibility, which reflect its immediate appearance: freedom, equality, the individual,

[41] The centrality of technology to the representations of recent events including the Arab Spring, the Occupy Movement, and the 2011 London riots suggest the various, sometime contradictory, ways that myths can be articulated.

> property, reciprocity, labour, capital, and so on. Marx's conceptual task is to reconstruct the systematic interrelatedness of these categories in such a way as to allow the theorist to transcend the objects' immediate appearance and reveal a more concrete, totalized (and, hence, mediated) rendering of that object….This ordering can be termed 'the process in thought, or 'the logical process.' The goal is not to 'recreate' the world out of thought... but to reconstruct the intelligibility of the world, and this requires appropriating the fundamental categories that capture that intelligibly. (Best, 2010, p. 71)

In relation to this dissertation, this more specifically entails unraveling the speculative investments in research and development (R&D) and infrastructure, the pursuit of new markets for consumer devices, management and organizational strategies, techno-utopian public policies, and celebratory marketing and advertising efforts associated with both UC and IMDs.

Myths provide conceptual frameworks that enable the actions and choices of social actors within a given historical moment. Myths matter in part because they "sometimes inspire powerful people to strive for their realization whatever the cost" (Mosco, 2004, p. 24). Yet the asymmetrical benefits that stem from these undertakings often underscore hierarchies and deeper structural inequalities regarding differential access to important technical and scientific knowledge or social capital. These inequalities—including monopolies over important social, spiritual, and technical knowledge and their resulting material and spiritual rewards—create what Innis calls a *monopoly of knowledge* (Innis, 1964). Although Innis, like Marx, did not employ the concept of myth systematically, his concept of monopoly of knowledge highlights the limitations and controls placed on the availability of knowledge in a narrow sense (e.g., technical knowledge, skills, training) as well as in a broader sense involving the circulation of explanatory myths that de-historicize social hierarchies and sustain (or challenge) these monopolies.[42]

2.4 Myths of Post-Industrial Capitalism

Myths offer symbolic resources that can be used for mobilizing public and private support for investments in expensive new technologies. Within these transformative myths are found a "body of beliefs that release symbolic forces, which not only enable action, but, in fact, trigger it and orient it in certain directions rather than others. These forces set the agenda for action and research programmes run by governments and supranational policymakers" (Mattelart, 2003, p. 2).

As I will demonstrate using the case of the BlackBerry, the ongoing transformation of IMDs—from a tool of labour to one of leisure and consumption[43]—is mediated by important assumptions about a broader transformation in capitalist political economies associated with a variety of post-industrial myths. For instance, "knowledge" (Drucker, 1969) "information" (Porat, 1977), "network" (Castells, 1996), and "creativity" (Florida, 2004), constitute important keywords in defining the motor of social and economic change, yet they are all premised on the continuity of capitalist social relations

[42] For example, as in the technical knowledge possessed by religious authorities in Egypt and Sumeria, or the role of Homeric poems and the development of alphabetic literacy in Ancient Greece (Innis, 2007); or a more contemporary development what he called the "mechanization of knowledge" (Innis, 1995, pp. 350-355).

[43] Culminating in their development into "remote controls for everyday life" (Chen, 2013).

and regimes of accumulation. They are therefore recurring myths about technological progress masking capital's struggle to exploit and control labour (both paid and unpaid).

In addition to the "mystifying" tendencies of capitalism's vitality, a key dynamo accelerating the production of post-industrial myths was the struggle between Western capitalism and the Soviet Union. In this Cold War it was technology, specifically military technology, which held the key to victory. This is evidenced in the fact that in 1965 "88 % of the research funds devoted to the aerospace industry and 60 % of electronics came from the government" (Mattelart, 2003, p. 48-49). It was this government subsidization of technological research that acted as a significant driver of the Cold War because technological superiority was seen as essential. The historical development of the American computer industry after World War II is bound up with government contracts established to retain computing power supremacy (Mowery & Langlois, 1996). Much of the basic R&D was subsidized by public funds through their integration with University computer science research (Mowery & Langlois, 1996).[44] Culminating in the Strategic Defense Initiative (SDI, also known as the "Star Wars" program) research program, initiated under President Ronald Reagan,[45] the end of the Cold War wrought widespread deregulation and liberalization in the North American technology sector. Creating a broader consumer market for computing technologies to absorb the resulting excess

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[44] Mowery & Langlois (1996) note that in the U.S., federally funded computer science research in Universities increased from 25% in 1982 to 40% in 1987 (p. 955). The military also played a key role in supporting the development of the civilian software industry account for approximately 6 billion USD in sales (or 50% of sales) in 1982. By 1990 military purchases accounted for 25 billion USD in sales (p. 959).

[45] Indeed, the large public investment (approximately 15 billion USD between 1984-1988) in relatively esoteric areas of R&D, often through contracts with private companies like GE, Lockheed, and Boeing, was justified both in terms of a Cold War deterrent but also in the expectation of civilian "spin-offs" that would commercialize new technologies. For an analysis of the relationship between military and civilian R&D stemming from SDI see Lichthenberg, 1989.

capacity became a policy priority of the U.S. government (SDI, 1992) and the computer industry (with help from advertising and marketing firms) seeking to make up revenue lost due to the end of the Cold War (Sharpe, 2009).

With the end of the Cold War, and with it a powerful justification for public subsidies for R&D in the high-technology sector, a re-orientation towards civilian markets engendered a new period of myth-making around both the computer industry and the Internet. As Boyer (2004) has demonstrated, myths (and Al Gore himself) played an important role in directing investment into ICT-related industries during the 1980s and 1990s, contributing to the stock market bubble and its eventual collapse. Belief in the arrival of a post-industrial growth model was fueled by the rapid wealth accumulated in Silicon Valley, generated through the tech-industry centered NASDAQ and the multitude of neologisms generated to capture the essence of the "new economy" (e.g., Castells, 1996).[46] In this context, ICTs, particularly after the Cold War, have contributed significantly to the modernization of "information exchange networks that have been influencing corporate finance and management for at least a century now" (Boyer, 2004, p. 143). The real benefactors of the first dot-com boom and bust were institutions that used ICTs to create new financial commodities and mobile flows of transnational capital, or institutions that could use global ICT networks to capitalize on an expanding array of free trade agreements (e.g., NAFTA), thereby accessing new markets for resources, labour, and consumers. Indeed, stock markets, such as the Dow Jones Industrial and the

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[46] The bursting of the technology bubble is far too complex an event to reduce to mere misconceptions or nefarious motivations of this or that investor or corporation. One might assert that the bursting bubble expressed a realignment between the self-reinforcing myths of technology bubble and the reality of a global economy governed by neoliberal(izing) trade policies (Harvey, 2005).

NASDAQ are sensitive to myths circulating in the wider public consciousness at a particular historical moment; stock traders and corporate executives do not make decisions in a vacuum. Stock traders, for example, are required to make important decisions in relatively short timeframes and, in so doing, often draw from dominant myths for guidance (see Garnham, 2004, p. 173).

There is still other research critiquing the relationship between myth and ICTs. Fransman (2002) has examined how myths—or what he calls shared "beliefs and visions"—shaped the response of the telecommunications industry to the rise of the Internet, resulting in the creation of an "infocommunications" industry. Brody and Dunstan (2003) have documented the role of myth in the spectacular rise and fall of telecommunications giant WorldCom. More tangibly, Lessig has detailed how values and beliefs can be embedded in the very software codes that provide the architecture of the Internet (Lessig, 2006). Babe (1990) has examined how myths have shaped the development of telecommunications policy in Canada. Myths pertaining to the economic and cultural significance of new ICTs share a much longer history dating back to at least the development of the telegraph (Carey, 1992; Mattelart, 2000).

2.5 The Personal Data Economy: The Rise of the Prosumer and IMDs

A central area of contemporary capitalist accumulation is personal data (Elmer, 2004; Lace, 2005; Manzerolle & Smeltzer, 2011).[47] *The Wall Street Journal* has a regular series entitled "What They Know" which deals explicitly with legal, political, and economic aspects of the personal data economy.[48] A report from the World Economic Forum (2012) entitled "Rethinking Personal Data: Strengthening Trust" suggests that personal data is the key economic resource of the 21st century. The report states that:

> The explosive growth in the quantity and quality of personal data has created a significant opportunity to generate new forms of economic and social value. Just as tradable assets like water and oil must flow to create value, so too must data. Instead of closing the taps or capping the wells, all actors can ensure that data flows in a measured way. (p. 5)
>
> Historically, the strength of a major economy is tightly linked to its ability to move physical goods. The Silk Route, the Roman roads and the English fleet all served as the economic backbones connecting vast geographies. Even though it is a virtual good, data is no different. Data needs to move to create value. Data alone on a server is like money hidden under a mattress. It is safe and secure, but largely stagnant and underutilized. (p. 7)

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[47] The personal data economy comprises companies that exploit consumer data for internal use, sale in a secondary market, or to provide specialized services and analysis. The World Economic Forum (2012) distinguishes three types of personal data that might be treated as an economic asset. *Volunteered data*, data offered voluntarily by users such as photos, blog posts, video, and so on. *Observed data* is data captured, controlled and owned by an organization often without the knowledge of the data-creating individual. *Inferred data*, "involves information computationally derived from all the data volunteered and observed" (p. 19). The secondary market for personal data is estimated at $2 billion USD in 2012, however this is a measure only of companies collecting data from third-parties (e.g., Azigo, Mydex) (Robin, 2012).

[48] See http://blogs.wsj.com/wtk/

This important sub-industry of the information economy helps support and circulate myths directly shaping the development and deployment of consumer ICTs as they accelerate the consumption and production of data.[49] Specifically, the personal data economy, as a site for capital investment and accumulation, amplifies myths about the emancipatory and/or empowering nature of digital prosumption (e.g., Google, Facebook, and Apple). In so doing, prosumption supports the consumption of devices and services, while also enabling the creation of a secondary market of personal data.[50] Because the Internet does not have an "identity layer" (meaning personal data is scattered and fragmented), Cavoukian (2012) estimates that a given user "releases over 700 items of personal data per day" (p. 3). This process has only accelerated with the proliferation of IMDs and the expansion of more contextual data about individual users. Thus myths that surround IMDs (and specifically UC and the BlackBerry) are promoted (by hardware vendors, network service providers, marketing and advertising firms) as more than just mere communication tools. Rather, they are multi-media lifestyle devices offering freedom and social connectivity by expanding the consumption of cultural commodities (e.g., ring-tones, applications, and television episodes) as well as the quality and quantity

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[49] This marketing orthodoxy is usefully summarized by the following quote: "There is one overriding, simple, but powerful message for all twenty-first-century marketing, media, and advertising executives: insight about consumers is the currency that trumps all others" (Vollmer & Precourt, 2008, p. 29). As one response to the commercialization of personal data for marketing purposes, a recent proposal in France would tax Internet companies based on profits associated with data mining and the commercialization of user data, affecting companies like Google and Facebook (Pfanner, 2013).

[50] Personal data is seen as a particular area of growth for the telecommunications industry since they are privy to detailed data stemming from the usage of IMDs (see World Economic Forum, 2011). Identification and authentication services alone are projected to reach $52 billion USD by 2020 (World Economic Forum, 2011).

of personal data available for commercial uses.[51] In conjunction with the increasing popularity of web 2.0 media, IMDs enable a steady stream of potentially valuable personal information to fund a lucrative sub-industry of data-merchants, aggregators, and marketing and management specialists (Zwick, 2009; Turow, 2006).

The economic necessity of personal data to contemporary capitalism has contributed to the renewed popularity of a post-industrial archetype—the *prosumer*—a figure that, since its popularization by Toffler (1981), embodies the convergence of production and consumption within the purview of an empowered and autonomous user-consumer of ICTs (see Comor, 2011). The prosumer, however, is in fact the techno-utopian representation of the sovereign consumer championed by neoclassical economists (Gowdy & Walton, 2003). In accordance with neoliberal theory, this figure provides a digitalized version of human rationality premised on self-interest. Thus it is thus not surprising that web 2.0 reflects a kind of neoliberal form of individualism that posits consumer sovereignty in the creation of user-generated content—a symbol of the empowerment of rational individuals over networks.

The enhanced communicative capacities of the prosumer are not only valorized by marketers, but also constitute the basis of Richard Florida's highly influential (though widely critiqued) thesis of the *creative class*. Florida explains this concept as referring to a class of labourers defined by their skills in symbolic manipulation and creation and their ability to accumulate and mobilize social capital as a privileged elite (Florida,

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[51] Both Google and Apple have recently faced scrutiny about their collection of precise locational data about individual users (Cheng, 2011); similar concerns have been directed at app makers (Bonnington, 2012) and telecommunications providers (Eckersley, 2011).

2006). This class carries with it the post-industrial postulate of a white-collar workforce typified by the information or knowledge professional (Bell, 1973; Castells, 2000). Florida's thesis, however, suggests a more thorough subordination of human creative energies and communicative capabilities to the search for a post-industrial economic model. This conceptualization is particularly important to this dissertation because of Florida's recent influence over policymakers and because this influence revolves around the crucial role of ICT networks, including IMDs, in compelling people to acquire and mobilize their "social capital" through technologically mediated networks in accordance with to the logic of self-promotion and self-branding (Hearn, 2008).[52]

Web 2.0, as myth (Scholz, 2008), for instance, helped 're-brand' the Internet, serving as a direct response to the collapse of the first dot-com bubble; a process outlined in O'Reilly's web 2.0 manifesto (O'Reilly, 2005). In this context, the web 2.0 brand can be understood as a renewed effort to fulfill both the commercial and democratic promises made in preceding decades regarding the wealth creating possibilities of the Internet—promises often articulated by individuals and institutions profiting from inflated stock prices and the inflow of investment capital (see Boyer, 2004).

The popularity of the prosumer as a contemporary archetype is reflected in a variety of recent texts describing the democratizing power of ICTs in light of web 2.0. Celebrating the fulfillment of Toffler's prophecies, and echoing Florida's optimism

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[52] More generally, the emphasis on branding (and brand management) within the marketing and advertising industry (Arvidsson, 2006; Thompson, 2004; Klein, 2000), expresses capitalism's own dependence on dedicated myth-makers—myth-makers who, consciously or not, propagate ways of thinking that obscure the systemic relations that are essential to capital's reproduction.

regarding the power of creativity, Tapscott and Williams argue that creativity and collaboration in the web 2.0 era has changed everything (2008). In a similar vein, Henry Jenkins (2008) optimistically describes "convergence culture" and "transmedia" as examples of the democratizing power of collaboration and user-generated content. In his work, Jenkins assesses the relationship between fans and the owners of branded content like Time Warner as democratic rather than exploitative (pp. 169). By way of contrast, a political economy perspective of fan culture highlights the fact that the affective labour of fans facilitates the production and extraction of surplus value by expanding the impact and distribution of commercially controlled and branded media content (Scott, 2009). This process has only accelerated with the rise of digital prosumption technologies and services (Scott, 2009).

Though users are actively generating content—whether in the form of text messages, email, file sharing, video uploads, blogs, or photojournals—the popularity of web-enabled devices is being touted as a platform for highly targeted commercial messages or for the purposes of collecting or data mining user information (Danna and Gandy, 2002; Lillie, 2008). The major challenge for telecommunications and media conglomerates is in properly channeling the user's now-enhanced communicative agency into the expansion of the personal data economy in order to maximize return on investment (ROI) particularly in light of costly infrastructure, excess capacity, and expensive R&D projects (World Economic Forum, 2011).

The search for ROI within the personal data economy (and specifically in relation to IMDs), brings surveillance deeper into everyday life, contributing to what David Lyon (2002) calls "the disappearing body" in social interactions. Interacting in digital networks are “bodies” of personally identifiable information—relaying one’s identity to any number of entities—acting as proxies for the real embodied individual. The automation of interaction by these increasingly algorithmic data proxies (Cheney-Lippold, 2011) instrumentalizes communication by minimizing informal or tacit knowledge; that is, leading to what Innis might term “the mechanization of knowledge” (Innis, 1995, pp. 350-355). Furthermore, the disappearing body of the social and economic actor undermines the supposed neutrality of the free market by creating asymmetrical knowledge about agents in a given exchange (Ruggles, 2005). As Ruggles explains, “in this new environment…it is our data shadows that speak to our transaction partners for us, and often they speak for us on topics selected by others, and without our knowledge or volition” (p. 11). Not only does communication become more automated and mechanical, attempting to approximate the needs of “friction free” market exchanges (Gates, 1995), it creates a new surveillance function embedded in its very operation; a condition where every communicative exchange can be intercepted and/or monitored by (often unknown) third parties (see O’Harrow, 2006).

The designated purpose of the most popular social networking sites (for example, Facebook and MySpace) have largely been vehicles for the collection of marketing data and the dissemination of marketing messages. The drive to implement “mobile strategies” as key to future profitability on the part of many web 2.0 companies,[53] signals how the

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[53] Indeed, the recent commercial interest in both “big data” and “cloud computing” by established technology companies like IBM, Microsoft, Oracle, and others, suggests the widening appeal of UC as an all-encompassing commercial goal. Gartner research projects worldwide enterprise spending on cloud services to increase from $91 billion USD in 2011 to $109 billion USD in 2012, reaching $207 billion USD by 2016 (Gartner, 2012b). Though important, I will not address this broadening of the myth of UC. For further critical analysis see boyd & Crawford, 2012; Franklin, 2012.

myth of UC is now a dominant paradigm in the development of commercial digital media in the near term. Though still speculative, the potential profitability of these proprietary networks (particularly as they are accessed using IMDs) lies in their ability to create highly segmented captive audience of technologically adept consumers. In this case, the personalization of consumer ICTs, including IMDs, creates scalable audiences with varying degrees of heterogeneity and segmentation (see Manzerolle & McGuigan, 2013). IMDs are used to further the ability, and thus the status, of constant polling and marketing surveillance under the guise of a democratizing of culture (particularly in the fashion celebrated by Shirky (2008) and Jenkins (2008)).

The current popularity of IMDs suggests that they are more than just another simple communication technology; they now represent a potentially lucrative venue (or "platform" to use an industry term) for consuming billable data and reconstituting what has been called "the audience commodity" as a collection of discrete individuals and identities (see Fuchs, 2009). The implications are all the more important because IMDs increasingly are being treated as essential technologies by growing numbers of consumers and have thus become dominant mediators of personal communication and information production and consumption (McGuigan, 2005; Pertierra, 2005).[54]

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[54] This dependency was acutely exposed during the service outages that followed in the wake of hurricane Sandy in 2012 (Wortham, 2012). By contrast, a chronic dependency is evidenced in the growing percentage of users that sleep next to their phones (44 of all mobile users, 66% of smartphone users; Smith, 2012), despite their tendency to disrupt sleeping patterns (Gaudin, 2012). A national survey of Americans revealed that a third of respondents would rather give up sex for a week than their smartphones (Jackson, 2011). This dependence has been associated with forms of obsession and/or addiction by some psychologists (Gibson, 2011; Gaudin, 2011). More profoundly, dependence on networked technologies like smartphones and Google have been associated with changes in the structure and function of the brain itself (Carr, 2008)—changes revealed through the growing use of brain pattern imaging technologies (Davidow, 2012).

Importantly, IMDs serve roles other than just communication. By associating mobile communication access with fashion and status through, for example, the branding and design of the iPhone or BlackBerry, such devices reflect a form of agency central to capitalist hegemony – possessive individualism (MacPherson, 1964). Possessive individualism refers not only to the goods one possesses, but also to the capacity to sell one's labour; it provides a basis for a labour market in which individuals sell their productive capacities as commodities. In so doing it creates a homology between the commodities one consumes and the labour one sells. Together with the doctrine of consumer sovereignty (McGuigan, 2000; Babe, 2006a), possessive individualism acts as an ideological lynchpin of neoliberal capitalism. These values are part of a deeper commodification of the self that links ICTs innovation to the search for exploitable labour, whether waged or unwaged. Thus by creating channels for personally identifiable data flows, IMDs are part of a commodification process that cuts across traditional distinctions between work and leisure. Thus the popularity of the prosumer and prosumption as terms celebrating the collapse of media production and consumption provides cover for the exploitation of free or unpaid labour by commercial interests (Comor, 2011).

There has been much recent research on the political, economic, and social importance of mobile communication technologies and services. Most of these texts focus either on the contextual and regional factors influencing the development of markets and/or dominant uses. This includes far-reaching and comparative sociological analyses (Castells et al., 2007; Katz et al., 2008; Goggin, 2011), "cell phone culture" (Goggin, 2006, 2008), "thumb culture" (Glotz et al., 2005), a recent collection on the iPhone (Snickers and Vonderau, 2012), and several journals dedicated to mobile media (e.g., *Mobile Media & Communication*, *Wi: Journal of Mobile Media,* and the *International Journal of Mobile Communications*). Fortunati (2002) has provided an opening volley linking the use of cell phones with a Marxist understanding of space and time insofar as these are essential to capitalist social relations.

Many corporate biographies and industry retrospectives have been written about mobile devices and services (e.g., Hunter, 2002; Zygmont, 2003; Mock, 2005; Rogers, 2008). Though often celebratory or uncritical in nature these texts offer valuable details, perspectives, and anecdotes that can be re-purposed for critical analyses. RIM and the BlackBerry have been the subject of two corporate biographies (Sweeny, 2009; McQueen, 2010), a third book dealing with early development of BlackBerry components (Tubbs & Gillett, 2011), and a whole host of celebratory, self-help, or business strategy texts that have emerged around the brand (e.g., Mittal et al., 2010; Michaluk, 2011). Some critical researchers have done key ethnographic and labour research on organizations that have equipped their workforce with BlackBerrys (Middleton, 2007).

Similarly, there have been a number of recent attempts to grapple with the socio-cultural implications of a society based on UC. For example, Sherry Turkle's *Alone Together* (2012), Jaron Lanier's *You Are Not A Gadget* (2010), John Tomlinson's *The Culture of Speed* (2007), Adrian Mackenzie's *Wirelessness* (2010), and Hassan and Purser's *24/7: Time and Temporality in the Network Society* (2007), reflect a representative sample of this bourgeoning academic literature. This dissertation adds to this existing literature a case study that specifically focuses on the interaction between political economy, technics, and myth. As case study, the BlackBerry is not only a rich object of study that touches upon the various themes found in past writings on mobile media, but foregrounds a prospectively important historical period in which UC has become an assumed necessity in the minds of both social actors and organizations.

2.6 In Summary

In this dissertation I employ both historical and materialist approaches to understanding the interaction between technological change, political economic interests, and myths as they are bound together in a specific technical artifact. I historicize how a particular conceptualization of connectedness attains a technical, political economic, and *lived* reality. This approach provides an opportunity to demonstrate how a particular technological artifact can be used to examine and critique the growth of a new condition of mediation, shaping the capacities for thought and action within a specific historical context. I employ the concept of myth to map this historical process, which comprises the interrelationship between commercial interests, the development of new technical capabilities, the investment in infrastructure, and the conceptualization of labour and leisure.

As such, my approach incorporates elements of a descriptive history *and* of critical political economy. This approach emphasizes, on the one hand, that the development of new technologies cannot be separated from the pursuit of profit including the competitive expansion of available products and services as well as the conceptualization and management of labour; and on the other hand, that this same process cannot be fully understood outside of the constraints shaped by the specific technical knowledge, strategic partnerships, policy frameworks, and competitive market dynamics in which commercial organizations compete. The integration of these approaches through the concept of myth helps to historicize what is now arguably, a taken-for-granted condition of mediation for those who have (consciously or not) adopted UC as a part of their everyday life.

Thus my specific use of myth in relation to mapping the rise of UC includes examining how the characteristics associated with its technical and commercial development (e.g., personalization, ubiquity, immediacy, flexibility, efficiency, and productivity) have contributed to the development of the BlackBerry brand of devices and services. The BlackBerry is not only a focused expression of the myth of UC, but also the result of pre-existing commitments to it on the part of incumbent telecommunications and technology companies seeking new revenues by commercializing investments in infrastructure, research and development, and spectrum licenses. More generally, I use myth to understand the coordination of (sometimes disparate) commercial interests in the creation of a relatively new market.

My method for using myth to analytically map the rise of UC is framed by three separate stages through which the market for devices and related services has emerged. It begins with the speculative investment in infrastructure and capacity by telecommunications providers and technology manufacturers and marketers. Here the myth motivates and justifies the build-out of new infrastructure and the development of new devices in the belief that future work and workers, will require new tools and services previously unavailable. This belief is informed by the prevalence, multiplication, and pre-existence of post-industrial myths suggesting a future wherein work is defined by the intellective capacities of a “professional” (“informational” or “knowledge-centric”) workforce. This assertion is built on actual transformations in the workforce of so-called advanced capitalist economies typically associated with neoliberalism and the waning of worker protections, including the decline of unions and the opening up of cheap labour markets through new trade agreements. Chapters 3 and 4 deal with this articulation of the myth of UC as it relates to the pursuit of new services and devices suitable for this post-industrial future. I situate the development of the BlackBerry out of this pursuit for new services and devices, wherein RIM provided a readily available “solution” to the anticipated needs of future of workers.

The second stage involves the conceptualization of a mobile workforce and virtual organization by corporate executives and management consultants. This was indicative of the power of UC to transform corporate governance and labour management. The result has been the creation of a larger market for BlackBerrys in keeping with the “demands” of a new professional class of networked workers adapted to the “new economy.”

The third stage depicts UC in relation to the rise of web 2.0 and the digital prosumer, and details how the BlackBerry was developed to incorporate and promote the new consumer-centric adoption of UC as a lifestyle. I suggest that the myth of UC, expressed through RIM’s success, becomes a *de facto* expectation of digital media *in toto*, as such making RIM’s branded experience of UC less competitive, and thereby allowing new entrants to redefine UC in ways involving an the emphasis on IMD applications (apps).

In each of these stages the BlackBerry, as a technical artifact, constitutes a material base from which to map how the myth of UC occludes the more profound transformation in capitalist labour organization, typically associated with a post-Fordist shift towards flexible workforces. The keyword "flexibility" is used here as a signal indicating how new media artifacts can be linked to new conditions of mediation that reflect changing political economic dynamics. As such, the myth of UC, while trumpeted as a new era for both worker empowerment and corporate productivity, creates the basis for the growing precarity of workers in economies focusing on informational products, services, and technologies.

While this project focuses on the production of commodities and services under the rubric of neoliberal policies and post-Fordist labour arrangements, the artifact is an analytical entry that maps onto a more ephemeral connection to an actual lived condition of mediation. Thus if RIM's slogan "take life with you" is any indication, IMDs are increasingly crucial technologies for fulfilling the economic and democratic promises implicit in post-industrial myths, particularly those valorizing networks and UC. Internet-enabled mobile devices are also important tools for managing the relationship between capital and labour in an era defined by the repetitive claims of a "new economy."

The myth of UC is a link to the social practices: ways of relating that are "preferred" or "adapted to" the re-organization of capitalist production and consumption in the context of global neoliberalism.

Chapter 3 – Wireless Data Standards, Devices, and Markets: Historical and Technical Foundations of Ubiquitous Connectivity

"People want their damn e-mail. Everybody has seen Star Trek. It's like everybody's a starship captain and they're fighting the Klingons and they want to be able to pull a communicator out of their pocket like that—boom" (Evans Corp. researcher Albert Daoust quoted in Chase, 2000).

3 Introduction

The discussion that follows outlines the necessary conditions for the rise of North America as the innovative core of UC.[55] The focus of this chapter is on a few key moments, institutions, and technologies—including the competition for wireless data standards, patents, and portable computing devices—with the goal of setting the stage for the rise of RIM and the "BlackBerry solution." Herein, I want to highlight the contingency of RIM's relative success in commercializing wireless data. This success reflects the convergence of established political economic interests (IBM, Motorola, Intel, Rogers, Ericsson, Apple), technological innovations (patents, standards), *and myths* about the prospective economic and cultural importance of UC. In so doing, I will describe the technological antecedents of UC, including important political economic factors that allowed RIM and the BlackBerry to become prominent. Mapping these

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[55] The focus of this chapter is the North American market—the primary birthplace of IMDs, including the smartphone and the tablet. Yet, the effective creation of this market is itself embedded in global ICT research, development, and supply chains. It is therefore important to first note that the pivot of global innovation in mobile technologies has shifted from Europe (using 2G GSM networks) to North America (under 3G). For the foreseeable future, American companies Apple and Google likely will continue to define the competitive dynamics of the IMD market, and thus the overall limitations (and potentials) of the era of ubiquitous connectivity.

antecedents will better contextualize why the BlackBerry was an essential component in the mass adoption of UC by both organizations and individual consumers.

Like other widely adopted communications technologies, the early development of UC was fraught by a tension between a search for industry-wide standardization and the quest to secure lucrative patents. This tension was reflected not only in the development of network infrastructure, but also in the devices themselves. Perhaps not since the early battles over telephone and wireless telegraphy, has the competitive search for patents shaped the evolution of a technological system so directly (Wu, 2010; Duhigg & Lohr, 2012).

This chapter is composed of three themes: the commercialization of wireless data and standards; the role of patents and intellectual property in structuring innovation in the technical development of ubiquitous connectivity; and the development of mobile/portable computing in the consumer marketplace.

3.1 Wireless Data Networks: ARDIS (DataTAC) and Mobitex

The development of a common standard for two-way wireless data transmission had been underway by incumbent telecommunications and hardware companies well before RIM began developing its devices in the late 1990s. In general, the development of these standards is often not only costly for a company but also very risky: by the time a satisfactory technical standard has been established the corporate entities developing it may not find partners within the supply chain to invest in the new technology particularly in the absence of an existing market demand. Although the technology was limited, by the early 1990s it was commonly accepted that wireless data networks (that is, wireless networks using packet-switching technologies)[56] would become commercially successful (Lindmark et al., 2004; Merrill, 1994; Meyers, 1998; Rogers, 2008). In 1993 analysts were projecting annual revenue from wireless data transmission services to reach $13 billion USD by 2000 (Shaffer, 1993). At the time, the parcel delivery service UPS was pushing to create a wireless data network to remotely track and coordinate the movement of packages and transports. Despite high-cost, the UPS network served as a vehicle for promoting the wider adoption of such networks (Blake, 1993). The Internet boom catalyzed further interest and investment in wireless data networks culminating in the marketing of 3G as the grand arrival of the truly *mobile* Internet (Edwards, 1998).

Arguably the earliest wireless data network, ARDIS (advanced radio data information service), emerged out of the cooperative effort of Motorola and IBM. Developed in 1983 for use by IBM's service division, ARDIS was a private mobile radio

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[56] RIM's 1998 Annual Report positioned its own wireless device and services by differentiating between circuit-switched and packet-switched networks. Specifically, circuit-switched networks do "not integrate well with the packet-based environments of office computing and the Internet" (RIM, 1998, p. 9). With an eye to highlighting the superiority of their own IP based products, the report offers this distinction between circuit and packet switched networks:

> The Internet is an inexpensive communications backbone for two-way messaging because it eliminates the need for call centres and human operators to relay messages. It also eliminates airtime, long distance, and roaming charges usually associated with wireless voice communications. The Internet also allows content such as stock quotes, weather, and news items to be selectively downloaded and efficiently delivered to a two-way messaging device. With packet technology, users are always connected and therefore receive real-time messages. By contrast, circuit-switched solutions are session-based rather than on-line, requiring users to call in to download messages on a periodic basis. Packet-switched, two-way messaging solutions have many other features which cannot be matched by voice-centric solutions which attempt to meet all wireless communication needs with a single device. Within the two-way packet switched segment of the wireless industry, *no single dominant technology has yet emerged*. Consumers therefore want access to devices that limit exposure to technological obsolescence by offering a wide choice of networks employing alternative technologies (emphasis added Rim, 1998, p.9).

(PMR) network for communicating with engineers and other field agents.[57] Though one of the first wireless data networks developed, it was privately used until 1990 when Motorola made this standard public. The release of ARDIS for commercial development was paralleled by the introduction of Mobitex in North America by telecommunications carriers seeking to develop wireless data services, specifically, Rogers Cantel (in Canada) and Ram Mobile DATA (later Bell South/Cingular) (in the U.S.).[58] Marketed under the brand name DataTAC, the ARDIS standard was adopted by carriers in ten countries by the end of the 1990s. Although technically developed and used before Mobitex for organizational and labour management, ARDIS' introduction as a commercially available wireless data network created competition between two main interests: device and networking manufacturers on the one hand, and telecommunications carriers on the other. Like the competition for 2G standards in the United States (that delayed the overall development of the mobile voice market by creating wasted investment in a fractured national infrastructure), wireless data standardization was an essential step in the generation of more advanced functions and devices (Cringley, 1993).

The catalyst for the commercialization of ARDIS, Mobitex, was developed out of a partnership between Swedish Televerket (ST) and Ericsson as a potential global standard for wireless data in the mid-1980s and was, in fact, the first *public* mobile data

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[57] Lindmark et al., explain the logistical and organizational importance of the ARDIS standard: "This system had the purpose of facilitating computer-aided dispatching, parts ordering and tracking, as well as service contract entitlement checking for IBM field service engineers. In 1986, some 12,000 IBM engineers used it, a figure that rose to 25,000 in 1990, when it was expanded to cover about 400 cities. ARDIS became an effective tool for improving IBM's service, in spite of limitations in the functionality of terminals and in roaming" (Lindmark et al., 2004, p. 300).
[58] In the United States, ARDIS was bought by American Satellite Corporation in 1998, which later changed its name to Motient in 2000.

communications system standard in the world (Linkdmark et al., 2004, p. 345).[59] Initially, development of Mobitex was directed by ST—a Swedish government telecommunications agency later privatized in the 1990s and renamed TeliaSonera.

The creation of Mobitex as a public wireless data standard involved significant costs in resources and labour. Lindmark notes that, at the time it was launched in 1986, the development of Mobitex entailed a considerable effort, absorbing in the range of “200 man-years on the project” (Lindmark et al., 2004, p. 345). Despite the important technical innovations associated with Mobitex, the initial market interest in it was limited due to a lack of manufacturers for components of its infrastructure and software, the high upfront capital investments required by telecommunications carriers, the absence of a clear industry standard,[60] and “low-computing competence,” meaning a relatively limited set of potential applications (Lindmark et al., 2004, p. 345). Developed specifically for commercial use (unlike ARDIS), by 1990 the Swedish Mobitex network was used internally and did not have any (external) paying customers.

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[59] It is important to note that the Swedish ICT industry was undergoing a prolonged period liberalization with Ericsson aggressively moving into international markets. By 1995, the OECD ranked Sweden as the most liberalized telecommunications market (OECD, 1995). Swedish firms, Ericsson in particular, benefited from the widespread liberalization of telecommunications markets internationally (see Firth & Mellor, 1999).

[60] A standard first involves the development of technical specifications for production and use, often followed by the approval of an international standards organization (for example, the IEEE) or industry consortium (GSMA); second, the creation of a supply chain for components and infrastructure, and commercial adoption. Rapid and widespread adoption of a standard without formal approval by a governing organization creates a “de facto” standard often tied to a specific corporate brand. In this respect, standards also can be tied closely to proprietary patents and intellectual property; a process that creates a rentier system for the commercialization of new technologies. The generally antagonistic relationship between these two processes—standardization and the patent system—have been particularly pronounced in the evolution of IMDs. As of this writing, patent suits among the major corporate interests—Google, Samsung, Apple—are set to frame the evolution of IMDs and related networks for the near future.

Despite differing somewhat in their technical composition, “Mobitex and DataTAC addressed roughly the same applications and market segments” (Lindmark et al., 2004, p. 301), yet both were initially undersubscribed. In an effort to generate commercial interest, Televerket and Ericsson partnered as Eritel to promote Mobitex internationally to telecommunications carriers seeking a competitive edge in a potentially lucrative new market: wireless data services. Eritel’s marketing campaign targeted the North American market specifically, and convinced a few large incumbents of the commercial viability of Mobitex. Indeed, Mike Lazaridis, founder of RIM, had attended one of the many promotional events for Mobitex held in North America and recognized the possibility of wireless data as a future core area of business for his company (Lazaridis, 2008). Using the clout of its parent companies, ARDIS also was marketed heavily to carriers around the world (Edwards, 1992). Both ARDIS and Mobitex became fixtures of trade shows, conventions, and other gatherings of business interests seeking a technological edge over competition (Trowbridge, 1992; Loudermilk, 1993; Wilson & Mason, 1993).

ARDIS and Mobitex are important in the genesis of UC not only because they ultimately dominated wireless data market when wireless email became technologically sophisticated and commercially lucrative but, also, because they both actively promoted UC to carriers, investors, and business consumers at the same time—planting the seeds for the future development of UC devices and infrastructure. In part, this initial push was positioned to build on the popularity of paging services—a business that many carriers and component manufacturers were familiar with.[61]

The rollout of both ARDIS and Mobitex, as well as the development of the Cellular Digital Packet Data (CDPD) consortium (Edwards, 1993),[62] generated considerable business media coverage.[63] Much of this centered on the mobile workforce. An article from *Network World* (a trade magazine focusing on "enterprise network strategies") framed the importance of ARDIS and Mobitex for corporations in terms of creating flexible workflows that will "set workers free" (Eckerson, 1992). Email was identified early on as a potential driver in the uptake of enterprise wireless data services, with Mobitex specifically identified as a vehicle for wireless email since it used Internet protocol (IP) for routing data (Louderback, 1992; Trowbridge, 1993). As one author for

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[61] Though important to the larger story of UC, paging services and devices are not directly addressed in this dissertation. For a detailed discussion see Lindmark et al., (2004, pp. 303). The marketing and technical parameters of most paging services limited the range of communication and curtailed the ability to develop more sophisticated platforms for two-way, packet-switched wireless data systems. Unfortunately, there are too few detailed academic treatise of pagers and paging services despite their global popularity before the growth of SMS texting. Revenue for paging services in the US reached $2.2 billion USD in 1993 (Donaldson, 1993). As components shrank in size and increased in processing power, pagers were quickly displaced (McCall, 2001) though they are still used in some markets. Paging technology was important for creating efficiencies in spectrum usage and sharing, as well as in the areas of battery-life, energy efficiency, and portability (Freeman, 1992).

[62] The CDPD was a consortium comprising wireless carriers—including Ameritech Cellular, Bell Atlantic Corp., Contel Cellular, Inc., GTE MobilNet, Inc., Southwestern Bell Mobile Systems—that had developed their own technical standard for wireless data transmission using the existing cellular infrastructure. CDPD reflected a combination of incumbent U.S. telecommunications carriers attempting to control the genesis of wireless data, as well as the public and commercial perception of the value of wireless data; however, because the standard was built on existing cellular infrastructure, the capacity was relatively limited in contrast to ARDIS and Motorola. In 1993, Motorola claimed patent infringement against the CDPD standard which stunted the adoption of their standard (Messmer, 1993). Nevertheless, the CDPD was used by carriers well into the 1990s in part due to its relatively low implementation costs (Edwards, 1998).

[63] There were several other minor wireless data standards being championed at this point, including CDI developed by Cellular Data Inc.; Apple Computer and French carrier Mtel were promoting a wireless data service known as Bebop in France and "personal communication service" in the U.S.; in addition to ARDIS, Motorola was developing a wireless data service using 66 orbiting satellites named Iridium (Cringley, 1993).

PC Week put it: “Wireless E-mail is not simply a replacement for beepers. Rather, it forms a messaging layer that gives a new immediacy to remote information exchange” (Louderback, 1992).[64]

Convincing carriers to buy into a given standard (in this case either ARDIS or Mobitex) was only one barrier to the commercial adoption of wireless data networks and services. Portable devices were an essential area of research and development, and a substantial barrier to this adoption (Hengel, 1994; Sweeney, 1997).

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[64] Mulling over the infinite possibilities offered by wireless email, Louderback’s considerations seem antiquated now:

> Imagine an all-day seminar or press conference. Right next to the water pitcher and the bowl of horribly sour candies is your E-mail appliance. Without disturbing anyone, and without getting up, you can let co-workers know just how bored you are. Or, if you're a reporter, you can file a story even before the press conference is over.
>
> Have you ever been on the floor of a stock exchange? It gets very loud out there. Now imagine outfitting brokers with untethered E-mail. How much would you pay to be on your broker's A-1 E-mail list?
>
> Even more exciting than these examples is the potential of RAM's soon-to-be-published API. Simple E-mail is only the tip of the iceberg once application developers start using packet-based messaging. Imagine a personal program running on your office PC, connected to some type of messaging slot. While on the road, you can use your custom packet-based appliance to send commands -- a database query, for instance, or a schedule update -- to that digital assistant, and it can send responses back to you. Like Xe rox's Paper Works but without the fax machine. (Louderback, 1992)

Figure 1: Motorola Marco designed for use on the ARDIS wireless data network[65]

In 1992, a year after Mobitex was deployed by RAM Mobile Data and Rogers (still with limited consumer interest), Rob J. Fraser, an engineer and Mobitex evangelist, outlined both the network specifications and potential uses of the Mobitex standard. His piece in the trade magazine *Communications* included this passage under the heading “The Personal Communicator”:

> To provide an illustration of a personal communicator application, most of which have yet to be imagined, let's assume that Mike wishes to book a meeting with Sue next Tuesday at 10:00 a.m. Mike pulls out his palm-top communicator from his jacket pocket and accesses Sue's appointment calendar, stored in her communicator. He sees “busy” or “open” on a calendar graphic, and sends a

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[65] The ARDIS network spawned a few early handsets, including Marco, a personal communicator produced by Motorola and IBM “for in-house use.” Launched in 1984, “Marco had been turned into a broader-use wireless data network by 1990. General Magic offered Envoy, but the system required a stylus and tablet to enter messages and the machine’s ability to recognize handwriting was poor” (McQueen, 2010, p. 75).

> request for Sue's open slot on Tuesday at 10:00 a.m. Sue has just completed a review of her stock portfolio-stored on her broker's computer-and is currently transferring funds from her brokerage account to her savings account. She now sees Mike's request and decides to cancel the request and book Mike's open slot for Thursday. Mike confirms, and the meeting is set. Both have access to a vast array of public and personal information, including weather, airline reservations, office mail, and fax communications through the Mobitex fax gateway (text messaging only). (Fraser, 1991, p. 2)

Fraser's comments anticipate the birth of the personal digital assistant (PDA), which was still being developed in the R&D departments of several companies including Apple, HP, and Dell. Initially conceived of as a relatively limited network for secure two-way paging and mobile data to be used by police and firefighters (McQueen, 2010, p. 60), improvements in the Mobitex network advanced by U.S. telecommunications giant BellSouth in 1998 provided better "coverage, longer battery lifetimes and faster radio access establishment, thus being more cost-effective and increasing the competitiveness with PMR and paging networks" (Lindmark et al., 2004, p. 349). The crucial contract for RIM's forthcoming Mobitex pagers (worth $90 million USD) on the part of BellSouth enabled the commercial development of RIM's BlackBerry because of BellSouth's size and substantial market share (it would later become a central component of the reconstituted AT&T) (RIM, 1998, p. 2).[66]

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[66] I discuss the context and implications of this contract in chapter 4.

The competition to develop a wireless data standard primarily was shaped by two industry consortiums. On the one hand, the ARDIS standard, which was jointly developed by IBM and Motorola and marketed under the brand name DataTAC and, on the other, Mobitex, created and promoted by Ericsson and North American telecommunications carriers including BellSouth and Rogers. Though both standards began to be commercially deployed shortly after 1990, their maturation took almost a decade, and relied almost exclusively on the development of end-user devices that could realize the potential of IP and packet-switched wireless data networks. Despite the long process of developing these standards, interest and investment was sustained by faith in their ultimate profitability (Anonymous, 1994), but also in a belief that this profitability required control over this new market by way of industry standardization. This long road to industry standardization illustrates the “buy-in” necessary on the part of established political economic interests in the process of commercializing UC.

3.2 Monopolies of Knowledge in the Competition for Cellular Standards: GSM, CDMA, and the Qualcomm Paradigm

Although the faith (reinforced by the scale of vested interests and investments) that sustained the protracted development and commercialization of wireless data networks was crucial, the competitive development of IMD and related network standards has been deeply affected by the U.S. patent system, a system that ultimately governs the rights to commercialize a given technology. The mass adoption of a given standard reflects more than just its prospective usefulness or profitability. It also incorporates the strategic importance of geopolitical agreements, supply chains, existing infrastructure, and commercial contracts (i.e. it constitutes a massive fixed capital investment). In this respect, the timing for the commercial release of both ARDIS and Mobitex could not have been worse. The early development of wireless data networks and standards paralleled the deployment of 2G digital cellular standards optimized for voice that drew the bulk of carrier investment and used the majority of commercially usable spectrum.

Through the development of the European Union, mobile telecommunications investment focused on voice through the collective adoption of the global standard for mobile (GSM) which provided an expansive market for compatible handsets and network components (Lindmark et al., 2004). Investment and innovation therefore followed the lines of optimizing voice first, and later helped popularize short-message-services (SMS) or texting (which would ultimately make paging obsolete). Because mobile data networks required manufacturers to develop portable devices that used specific chips, frequency ranges, and standards, few existing handset manufacturers saw advantage in sinking yet more money into R&D to develop technologies without a clear path to profitability.

To understand the innovation dynamics (and the dynamics retarding innovation) at play, it is worth going on a brief detour that elaborates the importance of second-generation (2G) wireless standards (which demonstrates precisely how digital encoding—wireless data—emerged to optimize the transmission of voice). As a case study, it also demonstrates how the process of standardization involves important geopolitical and economic issues because the utility of such standards relies on their wide (if not international) acceptance. After all, what use would a technical standard be if it was only partially adopted? Moreover, in the case of wireless connectivity, standards offer different ways to make use of the electromagnetic spectrum—how they convert a limited, shared, and natural phenomenon into a medium for transmitting information and facilitating communication.

While the technical details of 2G network standards are complicated,[67] the following discussion clarifies why the competition for network standards is so important for understanding the commercialization of UC-related technologies and, further, why the mobile industry is preoccupied with creating patents and litigating patent suits. It also provides an important historical and technical foundation for the rapid proliferation of smartphones and mobile data worldwide, in addition to shedding light on past (RIM vs. NTP Inc.) and current (the interest by RIM, Google, Apple, and Ericsson in Nortel's patent portfolio) controversies in the mobile industry. More broadly, this discussion demonstrates how a post-industrial narrative highlighting a new era of progress driven by human creativity is realized within the accumulation strategies of informational capitalism. The monopolies of knowledge enabled by the commodification of technical knowledge reflect an imperative that is arguably antagonistic to the infrastructure demands required for a global information society.

In response to the development and adoption of the GSM standard in Europe (and its former colonies), Qualcomm—a San Diego based technology company focusing on wireless standards, chips, and software—emerged to become a dominant force shaping the technical composition of mobile media by virtue of its expansive patent portfolio. This portfolio allowed Qualcomm to generate revenue by licensing or renting out its proprietary technical knowledge (including patents at the heart of emerging 4G

[67] See Cowhey et al. (2008) for a detailed explication.

networks). The United States Patent Office (USPO) in this context, is thus one of the most important organizations shaping technological innovation, particularly in mobile media,[68] and may help to explain why the post-cold war era has allowed the United States to produce many of the world's most important and powerful corporations (arguably with the exception of RIM).

When modulating a digital signal onto a carrier wave, there are a number of different approaches to encoding and then transmitting digital information under conditions of spectrum scarcity or shared usage. In order to maximize spectrum usage by devices within a relatively close proximity, digital encoding "multiple access" standards allow spectrum to be shared by users within a specific geographic region or "cell." The first and earliest multiple access standard developed was (and is) known as "frequency division multiple access" (FDMA) wherein a channel is created by transmitting *only* on a given frequency. It thereby can be decoded only through the use of a receiver tuned to the said frequency. As a fairly common and longstanding approach, FDMA suffers from two major problems. The first is its inefficient use of spectrum, particularly for its transmission of digital information, because it requires a specific frequency to only be used for a single communicative exchange. Second, FDMA has a tendency to be less secure and more prone to interference because it relies on just one frequency. Once that

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[68] The reason why patents have been particularly important for mobile media stems largely from the competitive influence of market mechanisms in helping select devices and standards. It is worth reiterating that the commercial development of UC is unique as the most important and complex global technological system to develop primarily in the post-cold war era. The evolution of mobile media therefore is more characteristically shaped by neoliberal policies than previous telecommunications and computer technologies that benefited from priorities involving national security or the public good.

frequency has been determined it can be intercepted or monitored fairly easily (Mock, 2005, pp. 43-44).

The second multiple access approach is “time division multiple access” (TDMA). This approach currently is the most universal and is the basis of the GSM standard. It uses carrier waves within any number of frequency ranges and divides the wave according to time slots onto which a communicator modulates data. To decode the message, the receiver must be synchronized with the specific time slots corresponding to the initial transmission. This standard, while using limited spectrum more efficiently, has technical limits, as the division of the spectrum into finer and finer time slots requires greater technical precision. Requiring sophisticated software for synchronizing these finer ‘slices,’ TDMA can be prone to synchronization problems (Mock, 2005, pp. 73-74).

The third, and most recent approach, is known as “code division multiple access” (CDMA). Here, the initial transmission—a cell phone—encodes and transmits a message on all frequencies within a given bandwidth, while encoding the message in such a way that only the intended recipient (a base station, or another mobile device) will be able to decode it. There are many advantages to this approach. Perhaps the most significant is increased security of communication, since each communicative exchange involves personalized coding. There is a clear link between the development of CDMA and the work of Claude Shannon (1949), whose mathematical theory of communication would inspire the founders of Qualcomm, the principle commercial developers and advocates of CDMA based standards (Mock, 2005). Paradoxically, Shannon’s formula for ensuring the perfect communication (involving homologous content at the points of encoding and decoding) required the production of more “noise” within the spectrum since sophisticated encryption technologies ensure security by transforming the signal into noise. In this respect, CDMA is an important standard ensuring the privatization of the spectrum. The strategic importance of CDMA for the military, however, restricted research until patents stemming as far back as 1941 were de-classified in the early 1980s.[69]

Another important benefit of CDMA is how it allows spectrum use to be maximized since transmission can occur using all frequencies. Despite requiring even more sophisticated software to encode and decode transmissions instantaneously as each is uniquely encoded, in theory enabling less problematic “handoffs”[70] between relaying points (as it does not fall victim to minor delays in time synchronization). Relay points known as “base stations” take on an even greater level of technical sophistication, requiring higher capital outlays by telecoms to invest in the system, thus pricing out many local and regional telecommunications providers. As a result, the growing complexity of technical standards and the higher costs of the related infrastructure put greater power into the hands of patent holders (the recent demand for and auction of Nortel patents reflects this power; see Lewis, 2011). In addition to higher processing power (provided by Qualcomm’s patented CDMA chipsets and components), CDMA handsets require more energy to broadcast a similarly encoded message on all available frequencies (to which the base station would allocate one open channel). Greater power to transmit signals meant creating yet another level of costly sophistication for device

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[69] See “Secret Communication System” U.S. patent # 2,292,387

[70] This term refers to the process by which different cells exchange data in order to maintain an open line of communication between two cell users. This is particularly important if one of the participants is moving between cells.

manufacturers (which is one reason why Qualcomm built its own CDMA-compatible handsets in the early stages of the standard's adoption).[71]

The case of Qualcomm offers important insight into how U.S. patent law and its global influence is shaping the development and deployment of mobile networks and devices worldwide, particularly in relation to 4G. Indeed, the rapid growth of Qualcomm is matched only by the emphasis the company places on its patent portfolio as its primary strategy, having eschewed most of its manufacturing operations. In the semiconductor industry this is known as a "fabless" company—maintaining only specialized chipset development and production facilities that allow a company to customize chips based on its patented CDMA based technologies.

Qualcomm's entry into the mobile standards competition is comparatively late given the rapid adoption of the GSM standard, reflecting the importance of patent systems in driving technological innovation, and the extent to which such innovation holds such geopolitical significance. For much of the 1990s and 2000s North American companies, with a few exceptions, were small agents in the mobile market, in large part because of the creation of the GSM standard for digital wireless transmission (Molisch, 2011, p. 6).[72] GSM provided a significant economy of scale for European companies, as well as first-mover advantage[73] having developed the standard in conjunction with

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[71] The worldwide dominance of Qualcomm creates clear problems for implementing cutting edge wireless infrastructure in developing countries, creating another qualitative dimension to the global digital divide.

[72] For a detailed history see: http://www.gsm-history.org/

[73] Because of its mutual and synchronous adoption by multiple national markets, and because it relied primarily on components and infrastructure from within the EU, GSM offered a readily available standard

prominent continental telecom and ICT manufacturers. Even though the standard itself was "open" (non-proprietary), the European Commission's agreement privileged its continental manufacturers who had the benefit of advance notice, preparation and public policy support—for example, national regulators agreed to provide incentives to users of GSM (as per the agreement there had to be at least one GSM provider in a given national market; see Cowhey et al., 2008).

Arguably, it is the standardization and interoperability of a society's communication infrastructure—particularly one as personalized as mobile communication—that enables its internal coherence at a functional and logistical level. The adoption of GSM as a regional and, ultimately, global open standard therefore had important geopolitical implications, especially as a precursor to the European Union developments more generally. GSM also was a specific expression of post-industrial mythologies that looked towards the complete networking of the world, requiring interoperability, shared standards and mutually beneficial infrastructural capabilities.[74] Indeed, the development and application of GSM arguably constitutes a tangible expression of the foundational myths of the information society.

While GSM foreshadowed the regulatory and technological emergence of a post-Cold war information society, the decision to adopt this standard by the European

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(complete with supply chain) that could be exported globally. This is in contrast to the U.S. approach that emphasized market competition in the selection of a 2G standard.

[74] Although he does not discuss GSM specifically, Mattelart addresses the implications of standards and standardization in *Information Society: An Introduction* (2003) and *Networking the World: 1794-2000* (2000).

community unsurprisingly avoided the competitive extremes experienced in the United States. In the market model, competition would either produce a dominant industry standard or it would generate a market with multiple standards (this, in fact, is what happened in North America). One of the disadvantages of the GSM process was that, from the outset, the standard was optimized largely for voice telephony. The primary reason for this was the fact that voice functionality was universally valued among member states (or, at least, the vested interests they represented) while SMS services were merely an afterthought (albeit one that would become a defining feature of the standard; see Goggin, 2006, pp. 64-77).

Relative to the European approach, the development of mobile standards in the United States (and by extension Canada) followed the path of regulatory "neutrality" in which standards developed by different interests competed for market dominance. This, it was argued by policymakers under the Reagan administration (Gandal et al., 2003), would develop American capacity and *incentivize* constant innovation while also (it was hoped) maximize the monetary return for a given standard and related network technologies. It was in this regulatory context that Qualcomm developed the CDMA–based mobile standard, chipsets, and devices.

One adverse effect of this approach was its emphasis on patent portfolios as competing providers prepared for a future adoption of their proprietary standard. This entailed a modicum of security in that current R&D expenditures eventually could be recouped. This competition, however, generated a race to patent every possible (and even minor) technological achievement in the hopes of attaining future rents on this prospective form of intellectual capital. Since the U.S. offered a sufficiently large market for multiple standards to co-exist and evolve, as opposed to the EU's constellation of smaller national markets (constituting an incentive for regulatory intervention), this market-based approach was justifiable to American policymakers. Furthermore, it was believed that this was the only route that would generate a competitive, American–based standard, one that could compete with the global dominance of GSM (Mock, 2005).[75]

The commercialization of 2G standards, primarily GSM and CDMA, created the basic infrastructure for the development of UC. As voice and data merged together in new services and devices, so too did wireless data and 2G technologies. Indeed, the earliest BlackBerrys incorporating both voice and data merged these two technologies. Focusing on the process of standardization also illustrates the geographic separation between the fruits of research and development and the production of the technologies themselves. Arguably, Qualcomm, in its pursuit of CDMA patents rather than tangible products, acted as a paradigmatic example of a post-industrial technology company

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[75] U.S. policy under Ronald Reagan and Bill Clinton held that market competition would be more adaptive to consumer demand, including the telecommunications providers investing in infrastructure. Though short-term competition between multiple standards would create some market "winners" and "losers," the process would yield a more advanced and competitive standard, one able to compete with GSM (Gandal et al., 2003). CDMA was the most notable, and significant, product of this policy as it relates to contemporary wireless standards. Large investments in one particular standard, and its respective infrastructure, can create a "tipping" point that leads to long-term adoption. As Gandal et al. (2003), write,

> The economic theory of tipping would suggest that the early adoption of one standard or the decision to formally set one standard in the EC [European Community] can tip the whole world toward that standard. Then the adoption of a single standard by a few large firms will likely tip the entire market toward that standard.8 In market competition between wireless standards, interconnection may mean that the standard tipping results may apply only if one standard gets far out in front of a competing standard early on before the competing standard has a chance to get established. In the case of second-generation wireless systems, CDMA succeeded despite the initial lead of GSM. (p. 330)

representing the dialectic of forces (technical knowledge) and relations (global division of labour) of production readily enabled by neoliberal policies.[76]

The development of fabless companies, though predominantly associated with the semiconductor (silicon chip) industry, is indicative of the overall post-industrial shift in most relatively developed capitalist economies. In this iteration of recent political economic history, companies began to outsource material production and emphasize, in their domestic operations, creative and knowledge intensive activities. RIM and its BlackBerry are both examples of this, outsourcing large portions of their device production to a factory in Mexico, away from its corporate headquarters in Waterloo, Ontario.[77] The separation of R&D and production that came to define the wireless market mirrored the uptake of the resulting devices and services by professionals purporting to represent the vanguard of post-industrial myths, those emphasizing the intellective aspects of labour. The emphasis on knowledge, intellectual property, and patents over hardware or manufacturing is central to these myths.

Even before Daniel Bell became famous for prophesizing the era of the knowledge economy, this post-industrial shift was identified by Marshall McLuhan in *Take Today: The Executive as Dropout* (1972) as a changing relation between hardware and software in the era of the computer. "Software is not just data but the organization of

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[76] One could further argue that Apple's success is premised on just such a separation. It is difficult imagine the mass production of iPhones and iPads in any place other than China, India, etc. due to the necessity of cheap labour to subsidize the high-cost components and technical sophistication. The planned replacement of Chinese workers by robots (Apple's largest manufacturing contractor Foxconn plans to deploy 1 million robots by 2014; see Yee & Jim, 2011) signals that the dialectic between forces and relations of production may yet induce a North American manufacturing renaissance, albeit one lead by innovations in robotics and artificial intelligence.

[77] It is difficult to believe that the first generations of BlackBerrys bore the words "Made in Canada."

information"; that is, data does not exist as such, but is always bound by a specific organizational and political economic context or environment (87). Later in the same text McLuhan describes the patent system as a "chastity belt" (103), knowingly or unknowingly echoing Thorstein Veblen's argument that much of the technological innovation guided by corporations constitutes a form of "sabotage" (1921)—sabotage in the sense that the structuring of corporate profit-seeking impedes human emancipation through the progressive accumulation of technical and scientific knowledge. Taken together, these theorists suggest that shifting one's commercial emphasis from manufacturing to knowledge does not necessarily mean that social and technological capacities have been unleashed for the betterment of humanity. Instead, these constitute developments that often are subsumed by the division of mental from manual labour.

As already mentioned, post-industrial myths tend to conceal the production of powerful new monopolies of knowledge (Innis, 1950). Specifically, the centrality of patents to the evolution of highly complex technical systems, like those enabling UC, almost ensure that their evolution is consistent with particular commercial interests (Apple, Qualcomm, IBM). These monopolies over technical knowledge and the rights to commercially exploit them can be contrasted with the general absence of understanding how they work or the economic and other conditions of their production on the part of most consumers. Thus UC, and related devices, appear to work as if by magic.[78]

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[78] The "black boxing" of technical knowledge adds to the fetishistic nature of the commodity form generally. In this case, the production of sophisticated consumer devices like IMD express the global division of labour in the context of neoliberal policies. The creation of advanced technical knowledge depends on readily available markets of cheap labour for the commercialization of this knowledge. This relationship is epitomized by the contractual arrangements between Apple and Foxconn, the manufacturer

Innis' concept of monopolies of knowledge is therefore significant for understanding the importance of patents to UC for two reasons: it suggests the significance of technical expertise in the development of media in everyday life (thus the power of a technical elite), as well as the commercial exploitation of this knowledge through a system that generates revenue both directly through the commodification of knowledge (i.e. the sale of devices) and through rents on the rights to commercially exploit this technical knowledge. Yet for Innis, monopolies of knowledge gain a particularly important significance when they pertain to the means of communication. The right to develop and commercially exploit new technical and scientific knowledge constrains access by intertwining the technical foundations of communication media with the need to recuperate investment and generate profits for investors (usually as soon as possible.[79] Monopolies of knowledge thus set into motion political economic forces

of many of Apple's most popular products (e.g., iPhone, iPad). For discussion of labour and Apple see Duhigg & Bradsher, 2012; Duhigg & Barboza, 2012;

[79] Between 1994 and 2001, ICT-related patents constituted the largest portion of patents granted by both the European Patent Office (EPO) and the U.S. Patent and Trademark Office (USPTO), from 28% in1994 to 35% in 2001 of patents granted (OECD, 2004a, p. 13). The OECD notes that this increase is part of a broader shift towards R&D as a central business strategy: "Between 1990 and 2001 industry-financed R&D in the OECD region rose 51% in real terms from USD 244 billion to USD 368 billion, or from 1.31% to 1.48% of GDP. Much of this growth was driven by high-technology manufacturing and knowledge-intensive service sectors, in particular ICT and pharmaceuticals – the same sectors that have seen the most rapid increases in patenting" (p. 15). Further, OECD estimates that during this period, licensing revenues for patents has increased from $10 billion USD in 1990 to $100 billion USD in 2000 (p. 16). For an extended analysis on this topic see Miller, 2007; OECD, 2004a; Seidenberg, 2012. Since late 2012, the International Telecommunications Union has convened a series of Round Table discussions on this topic and has assembled an Ad Hoc Research Group on Intellectual Property Rights under the Telecommunications Standards Bureau of the ITU. A detailed report from this research group is expected in 2013 (ITU, 2013). See http://www.itu.int/en/ITU-T/ipr/Pages/adhoc.aspx

seeking to incorporate both control over the means of communication as well as the content of communication.[80]

Ideally, intellective capacities are either to be channeled into the structures and institutions of capital accumulation or to be subject to costs associated with their use outside of the wage relation (e.g., in everyday social life). Recently, Andre Gorz has summarized this tendency in contemporary capitalism: “The operatives of the network economy are actors in a form of organization that is ceaselessly self-organizing. Their product is not a tangible thing, but, first and foremost, the interactivity that fuels everyone’s activity” (Gorz, 2010, p. 13). But as Gorz goes on to note, it is not just knowledge that becomes a source of monopoly control: “The appropriation does not always need to be direct. It is enough for capital to appropriate the means of access to

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[80] As Neill (1972) notes, Innis’ use of the term monopoly varied between two interrelated levels of analysis. At a more restricted and micro level, the term monopoly referred to the “control of scarce commodities, skills, political influence, or information” (p. 100). In this sense we can think of patents as a legal right to restrict, codify, and commercialize technical knowledge. Thus while the pursuit of standardization is a means of creating monopolies of knowledge that reflect specific vested interests, it is also an essential precursor to the widespread societal adoption of a new technology and related techniques. It is in this later process that Innis’ use of the term monopoly gains a broader scope signifying “the dominance of one medium of communication in a social system. In such a case the firms and industries involved may be perfectly competitive but the medium itself as the dominant channel of intercourse monopolizes information and, in consequence, the general climate of opinion, with the effect that one civilization (organization of values) and its vested interests are entrenched” (p. 100). In this more expanded application, we can think of UC as providing a “dominant channel of intercourse” influencing the general climate of opinion by emphasizing “present-mindedness” and immediacy as essential values in the commercial and cultural articulation of CCC. As such, these monopolies can act as a central means for dominant interests to maintain their power precisely because they constitute the basis through which CCC might be articulated. For example, the monopoly of communication enabled by the adoption of steam-powered presses in the newspaper industry “did not carry with it the seeds of a revolution against its directing class. Because it represented the mechanization of the vernacular, it could not become removed from the language of the masses. Moreover, because it carried the ability to amplify a centrally produced message in the vernacular, it had the capacity to mobilize and transform, with hitherto unheard of rapidity, the overall psychology of a society. It not only could deliver the message, it also could change the nature of the mind-frame interpreting the message” (Watson, 2006, p. 285). In this summary, Watson highlights how Innis’ concept of monopoly captures the interaction between technical, political economic, and cultural forces, and further, that new technologies need not be disruptive or destabilizing towards dominant power structures provided the “mind-frame” reproduces the values or biases (e.g., immediacy) of those power structures.

knowledge—particularly the means of access to the Internet—to retain control of knowledge and prevent it from becoming a plentiful collective good. Access—and the means of access—to knowledge thus become the major stakes in a central conflict" (Gorz, 2010, p. 55). Indeed, both Apple and Google, the largest and most powerful technology companies, might both be considered examples of fabless companies in their own right since they are primarily involved in creative elements—branding, product design, marketing, patents— while outsourcing actual production to mostly Chinese companies such as Foxconn. Huws et al. (2009) have extensively documented this global division of "mental" and "manual" labour, foregrounding how this division is predicated on the commodification of knowledge through "standardization and fragmentation" (p. 27). The resulting transformation in the commercial production and exploitation of knowledge (as in the case of the preceding discussion on technical standards and the patent system) is itself a product of the restructuring of labour capacities and their management (p. 31).[81] The central strategic role of patents within the mobile industry reflects the profitability of this coordinated control over knowledge.

The focused-pursuit of patents and intellectual property is a hallmark of post-industrial strategies (though this compulsion has been a part of the U.S. patent system since its inception; see Noble, 1977, pp. 84). Indeed, the major technical developments that underpin the current condition of UC are as much a result of technical and economic factors as they are a product of legal maneuvering. Patents are particularly important during times of rapid technological change (as RIM has learned at considerable cost),

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[81] In chapters 5 and 6 I look at how this compulsion became a crucial component of the success of the BlackBerry, and UC as a strategic goal for labour management more generally.

where new platforms are competing to become the de facto industry standard. Qualcomm is a paradigmatic expression of this drive to gear their business model towards the production of rents on codified forms of technical knowledge (see Huws & Dahlmann, 2009). Its founders identified early on that the real objective for modern technology companies, if they want to remain competitive and/or innovative, is to offload most, if not all, manufacturing operations and emphasize R&D in addition to intellectual property and patents in their business models (Mock, 2005, pp. 152-161). Qualcomm was one of the first transnational corporations (TNC) to make this crucial transition, thus setting an example for others, particularly in the field of mobile technologies. Over the course of Qualcomm's rise, mobile remained one of the most rapidly changing technological markets—reflecting the post-Cold war era of free trade and the global search for cheap labour. In most forms of technology manufacturing, margins are thin, labour and equipment costs high, and maintaining the requisite facilities absorbs a great deal of resources that could otherwise be directed towards innovation, research, and marketing and branding efforts.

RIM itself has both benefited and suffered in this climate, offering an infamous example of some of the odd implications characterizing the American patent system. Specifically, RIM was the subject of a widely publicized patent dispute regarding a company called NTP (which asserted a patent infringement on RIM's pushed-based wireless email). The case sheds light on a seedy area of the current American intellectual property regime (to which other legal systems like Canada's generally follow) that has spawned what are euphemistically called "patent trolls"—companies whose sole existence is predicated on filing and/or acquiring as many patents as possible and then waiting for a successful company to inadvertently infringe upon said patent (Magliocca, 2007). These companies take advantage of the basic post-industrial emphasis on the commercial exploitation of technical (patentable) knowledge. Their business model relies solely on the accumulation of technical knowledge with the hope that they will be (profitably) infringed upon.

Patent-holding companies turn the monopolistic logic at the heart of the patent system into a predatory and parasitic influence upon corporate capital. The case between NTP and RIM stretched out over four years (2002-2006) and, in the end, cost RIM $650 million USD plus future royalties (this constituted the world's largest patent settlement up until that point). It was widely followed within the tech industry and set legal precedent. Moreover, it demonstrated how a patent system favouring exclusive ownership rights had fostered an arguably counter-productive system in which non-producers hold important intellectual property without actual making anything or using their patents productively.[82]

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[82] The NTP-RIM case exposed the serious flaws in the U.S. patent system, as the USPO subsequently was inundated with review requests with a rising pressure for quick turnaround times. In an article on the RIM case, legal scholar and technology journalist Tim Wu cites a report by the patent examiner's union describing the working conditions at the U.S. patent office as "sweatshop" like (Wu, 2006). It is perhaps for this reason that the patents in question, as RIM's lawyers argued, were so incredibly vague regarding the actual technical application of wireless email that it could not be held to have violated the patents. As Wu's *Slate* article points out, the sheer generality of some patents, and their legal enforcement, places a spotlight on the current IP regime, demonstrating that serious reforms in this regard must be taken (Wu, 2006). A fact that has recently become the subject of congressional action in the United States, but resulting in little change; for an overview, see http://www.aminn.org/patent-legislation What was represented in the patent was simply an idea of wireless email and not a schematic for its actual application, at least in so far as RIM was concerned. Yet the U.S. court ultimately sided with NTP (one might yet again speculate, as Wu (2006) does, as to the geopolitical biases involved since the case pits a market leading Canadian company against a small American "entrepreneurial" venture), setting off a flurry of patent suits that continue to this day and are particularly acute in mobile/wireless industry. Though important as a gatekeeper to the lucrative American market, the USPO's authority is by no means universal. Major patent cases are often held in multiple jurisdictions, though verdicts in the U.S. are watched more closely and can hold more sway as

Perhaps one of the most costly setbacks in this respect for RIM was the inability to devote resources to pursuing a broader market share for its BlackBerry technology.[83] In the years between 2002-2006, the future of RIM and the BlackBerry was in question. As such, opening up a new marketing frontier with respect to the prosumer/consumer segment made little sense from the perspective of potential customers—particularly the telecom providers that would be supporting future BlackBerry devices. Clearly on display in this case is the important role that lawyers, intellectual property, and patents play in the overall systems of technological innovation that have given way to national and international intellectual property regimes. Indeed, by the mid-2000s, lawyers had become as important as engineers and marketers in determining the ebbs and flows of technology innovation.

3.3 From Newton to PalmPilot to BlackBerry

While the competition for wireless data standards pre-occupied many large incumbents in the telecommunications industry, a parallel search for a portable computing device approached the technical problem of UC from the perspective of interface design and usability. The development of a substantive consumer market for mobile computing devices illustrates technical stepping-stones in the progression of UC

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precedent for patent cases in other countries. In some cases, like Apple's recent multi-jurisdiction patent suit against Samsung, verdicts can differ outside of the U.S. (Tabouchi & Wingfield, 2012).

[83] This is reflected by a substantive drop in R&D costs from 13% of revenue in 2002 to 6% in 2006. By contrast, litigation costs went from 0% of revenue in 2002 to a high of 26% of revenue in 2005, then dropping to 10% in 2006. As percentage of net income, litigation costs consumed 62% in 2005 and 35% in 2006 (Weston & Lim, 2007, p.17).

toward consumer adoption. Aside from the issues associated with the standardized transmission of wireless data, there was still the problem of making handheld devices portable, able to quickly process wireless data, and capable of offering a range of applications that would demonstrate their versatility and usefulness to a range of consumers. In the early 1990s, the mobile computing market was fragmented between consumers using "palmtop and electronic organizers" for both personal uses and as "corporate productivity tools" (Calem, 1992).

Like in the case of wireless standardization, competition to develop a widely adopted mobile computing ecosystem primarily included large industry incumbents like IBM, Xerox, HP and, as I will discuss shortly, Apple. As addressed in this section, the sale and marketing of calculators using microchips constituted the first mass consumer market for mobile computing devices.[84] The success of this area generated subsequent

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[84] One of the central precursors was the development of the microchip in the early 1960s followed by the microprocessor in the 1970s—both reducing the component size required for computing to occur. Yet miniaturization of components was not the only obstacle. Battery power was a long-standing barrier to portable computing power. Between shrinking microprocessors and increasing battery power, a large consumer market has used mobile computing at least since the late 1960s, at which point the calculator became a focal point of popular interest (Zygmont, 2003). The success of the calculator supported a belief that the types of portable computing depicted in, for example, the television series *Star Trek* could become a technical and commercial reality.

Mini-computers of various kinds became available in the late 1980s, and a small niche market developed in the early to mid-1990s, with bulky, yet portable computers like the HP 95LX (1991) and 200LX palmtop computers (1994), and various Pocket PCs running a scaled-down various of Microsoft Windows (1996) (Zygmont, 2003). Processing power, battery life, and functionality were limited, yet this did not stop many of the largest corporations in personal computing from attempting to expand the market for mobile computing. HP, Dell, and Microsoft attempted to capitalize on the public's interest in a mobile computer like the ones depicted in popular science fiction. Wireless connectivity aside, despite heavy investment on the part of these established companies, mobile computing of this sort never established a sustainable mass market in the 1990s. Typical consumers of these types of devices never moved beyond the 'early-adopters' and corporate employees who could afford costly gadgetry of this sort.

Similarly, wireless data transmission was largely prefigured in the development of commercial paging services, which did not use packet-switching technologies, but from the average consumer's perspective investments in R&D, including the development of a supply chain for sophisticated components (like microchips) which would be essential for UC and the BlackBerry. This section furthermore contextualizes the contingency that framed the early successes of the BlackBerry and its material drawing together of wireless data connectivity with mobile computing. However, it is also important to highlight two “failures’ that preceded the BlackBerry. The first was Apple’s unsuccessful myth-making apparatus (in the example of the Newton), which constituted a failure that gave way to the entry of a relative newcomer, Palm. Second, Palm’s subsequent failure offers insights into why the BlackBerry offered a “solution” to the technical and commercial barriers facing UC. Furthermore, this discussion anticipates an analysis in chapter 5 regarding the role of myths in supporting the policy-frameworks that supported the early development of RIM and the BlackBerry.

3.4 Apple’s Newton: Birth of the PDA

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offered wireless data transmission, albeit only one-way. By the mid-1980s paging services had spread worldwide and constituted an important market in their own right (Lindmark, 2004, p. 303). The possibilities for two-way paging were, however, similarly stymied by limitations in power supply, processing power, and inadequate network infrastructure (p. 303). Despite the rather restricted nature of paging services, they did allow for minimal information to be wirelessly communicated and demonstrated that consumers (whether for professional or social uses) recognized the usefulness of such connectivity. Paging services provided relatively high revenues since they required little spectrum to serve the needs of subscribers. Moreover, once primary infrastructure was in place, paging networks were relatively inexpensive to operate. Device battery and processing power could remain limited because paging primarily involved one-way communication and contained relatively little actual information. Yet two-way paging was of great interest to telecom providers because it was believed that such services could increase the average revenue per user (ARPU) because telecoms could institute pay-per-byte billing (or “usage based billing” to use a contemporary term).

The proliferation of micro-computers and pagers created both a consumer base and a supply chain focusing on portable devices with the goal of consumerisation. Micro-computers emphasized the development of mobile or portable computing, while pagers offered a service for delivering small packets of information ubiquitously. Reconciling these two potential markets was a major goal of device manufacturers throughout the 1990s, but a few notable examples are worth addressing.

The difficulties of fusing together and then successfully commercializing wireless data and mobile computing can best be illustrated in the two most prominent precursors to the BlackBerry and, consequently, the smartphone: Apple's Newton and the PalmPilot. This "personal digital assistant" (PDA) was the much-hyped forbearer of mobile and ubiquitous computing—a term initially conjured up to launch the Newton (Carlton, 1997, p. 197). Despite the fact that wireless connectivity had yet to be successfully featured as a core PDA capability, this category of consumer electronics became an important tool in both creating demand for mobile computing devices and demonstrating the value that such devices might hold for both work and leisure.

Given Apple's dominant position in the North American mobile market in 2012,[85] taking a mere four years to overtake even the most entrenched corporate brands (Nokia being notably effected, with RIM scrambling to adapt), it is often forgotten that the company made an earlier foray into mass mobile computing. Unlike the iPhone and iPad, Apple's Newton was both a commercial and technological disaster. Despite the intentions of the original research team (Linzmayer, 2004, p.184), the Newton ultimately eschewed wireless connectivity for its initial release in order to minimize costs and appeal to a broad consumer base.[86] As such, it succeeded, to a degree, in bringing mobile computing to the public consciousness in a way that played on popular science fiction depictions.

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[85] By the fourth quarter of 2012, Apple controlled 34% of the U.S. mobile handset market, more than all other competitors (Strategy Analytics, 2013).

[86] The original Newton research team, lead by hardware engineer Steve Sakoman, designed a sophisticated device codenamed "Figaro" which "measured 8.5 by 11 inches, had a touch-sensitive active-matrix screen, a pen for handwriting recognition data input, a hard disk, plus infrared port for beaming data across vast distances" (Linzmayer, 2004, p.184). The consumer cost for the device was estimated at $6000 to $8000 USD (p. 184).

Demonstrating this link is the fact that one of Apple's operating system projects was named "Star Trek" (Carleton, 1997, p. 169).

Apple marketed this PDA device with an ambitious advertising blitz,[87] raising public expectations while suggesting that their supposed wishes for the technological sublime were coming true. The official announcement that introduced the Newton took place at the Consumer Electronics Show in Las Vegas (a central trade show for the industry). As Carlton recounts:

> Sculley's keynote[88] was one of the most highly anticipated ever for a trade show. The ballroom of the Las Vegas Hilton could hold only about 1,200 people, so the seats filled quickly as hundreds more show attendees were turned away. The lights lowered as Sculley, looking relaxed in his Apple attire of khakis and a casual shirt, ambled onstage, gripped the podium, and began drawing a world picture of his PDA as the center of a new digital universe, so immense that he predicted it would attain $3.5 trillion in annual revenues within a decade. Since everyone in the computer industry is watchful for the next new wave, lest they be left behind, word of a brand-new, multi-trillion dollar industry rocketed out of the cramped ballroom into news reports all over the world. Although other companies had handheld computers in the works, none contained the promised flair of the Newton. (Carlton, 1997, p. 197)

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[87] Though specific costs are unavailable for this campaign, according to Apple's Annual Report filled with the U.S. Security and Exchange Commission, advertising and marketing costs increased from $134 million USD in 1992 to $158 million USD in 1994 (Apple, 1994, p. S-5). Over the same period R&D expenses rose from $564 million USD in 1992, to $665 million USD in 1993, to $602 million USD in 1994 (p. 7).

[88] John Sculley was Apple CEO from 1983 to 1993.

By 1993, when Newton was launched as the "Newton MessagePad," Apple had spent roughly $500 million USD developing it (Carlton, 1997, p. 233). Ads for Newton often were filled with text that enumerated its seemingly endless capabilities (see figure 2). The device was meant to be a means of organizing, making efficient and convenient the daily information technology needs of its user (Linzmayer, 2004, p. 195).[89] It was marketed as having the ability to recognize handwriting through a touch screen interface, as well as the ability to sync calendars, contacts, and documents with a personal computer, preferably a Mac (see figure 2).

[89] For example, Apple's marketing emphasized the general "communications and organizational features" like calendar scheduling or daily task manager (Linzmayer, 2004, p. 195).

Figure 2: Ad for Apple's Newton

Over the course of Newton's advertising campaign Apple raised consumer expectations but in the end could not deliver on all that it had promised. Initial reviews were almost universally bad, with weak sales that got worse through word of mouth (particularly damning were the negative opinions of devoted Apple users). What was supposed to be a new era in consumer electronics became a "PR nightmare" (Carlton, 1997, p. 236). Gary Trudeau dedicated an entire week of his Doonesbury comic strip to mocking the device. In one particularly infamous strip, the central character writes, "I am writing a test sentence" only to have it erroneously translated into "egg freckles."[90] A *Business Week* article on the device noted that Silicon Valley pundits, in response, were redefining PDA as "probably disappointed again" (Carlton, 1997, p. 198). It is worth noting that this "disappointment" implies a popular aspiration in accordance with the myth that is unfolding. Newton's continuing failure ultimately tainted consumer (and investor) demand for PDAs, strained to Apple's ballooning R&D budget,[91] and contributed to the departure of CEO John Sculley (Linzmayer, 2004, pp. 183-200). Apple's failure also tainted the retail consumer segment for PDAs, making it harder for other companies to break into the market by first requiring extensive resources to alter soured consumer (and investor) sentiments (Butter and Pogue, 2002, p. 59). For example, the launch campaign for the PalmPilot in 1996 cost $5 million USD, a sum roughly equal to the budget allotted by Apple for its initial Newton launch (Khermouch, 1997).[92]

The relative success of the PalmPilot campaign which, learning from the missteps of the Newton in that it was "underpromised and overdelivered," allowed Palm to capture

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[90] http://www.computerhistory.org/revolution/mobile-computing/18/319/1714

[91] In the quarter preceding the August 1993 launch of the Newton, Apple announced a loss of $188 million USD, its "largest quarterly loss ever" (Linzmayer, 2004, p. 194). Apple's R&D budget peaked in 1993 at $665 million USD but dropped to $303 million in 1998, representing the fiscal year Newton was discontinued (Apple, 1998, p. 6).

[92] http://adage.com/article/adage-encyclopedia/apple-computer/98322/

51% of the mobile computing market by selling 360,000 units at $299 USD each (Khermouch, 1997). Palm also benefited from Apple's decision to close its Newton division in 1998, with many skilled employees leaving the division amid its prolonged decline (Linzmayer, 2004, p. 202). The PalmPilot's market share rose to 63% in the following year (Horowitz, 1998). By contrast, the Newton sold 80,000 units in 1993 (the year of its launch) at the retail price range between $699 to $949 USD (Hallerman, 1993).[93] In the year leading up to its discontinuation, the Newton accounted for only 3% of the global handheld market, selling 54,000 units (Horowitz, 1998).

Despite this failure, not only is the Newton the forefather of the IMD device category, it also reflects the failure of existing or emerging mythic expectations. Newton offered abysmal usability compounded by an inability for Apple (and other third parties) to design applications that could help augment the utility of the device. It is thus worth pausing for a moment to outline the reasons why, despite the support of Apple (already in 1993 one of the world's largest and most popular technology brands), Newton was a marketplace failure. This is a particularly worthwhile endeavour because it also highlights, by comparison, the reasons why the BlackBerry succeeded.

By far the most debilitating choice made in the design and marketing of the Newton was the strategic focus on selling it to a mass consumer market rather than emphasizing its business and enterprise uses and users. This had several implications. First, to reach most consumers costs had to be kept relatively low, and thus component

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[93] These tepid sales numbers contributed to Apple's decision to layoff 2,500 employees, constituting 15% of its total workforce in late-1993 (Anonymous, 1993).

parts costs minimized in order to ensure that the final product could be sold at a "reasonable" price (the PalmPilot unit cost was $299-350 USD). As a result, the Newton had relatively limited functionality and processing power, in contrast to the hype that had been built around it. Moreover, wireless connectivity had to be sacrificed in order to cut down on the size and cost of components, including its radio and battery. Second, it required substantive marketing and advertising costs because it was effectively a new device category. Such costs put more pressure on Apple to attain the revenues needed to re-pay these investments, resulting in a higher than ideal price tag. Despite these early failures, and a general unwillingness of the public—even among Mac users—to become part of the Newton stream of technologies, Apple continued manufacturing and promoting the device until its cancellation near the end of the decade (Carlton, 1997, p. 235-239)

The question of targeting either the mass consumer or the business market will be addressed in greater detail in subsequent chapters, but it is important to note at this point that Apple's choice of pursuing a consumer market for its Newton was, from the outset, a difficult proposition. On the one hand, there was an already existing set of assumptions about what mobile computing should look like and offer based on popular representations. Expectations for the Newton, particularly in the business and technology press, were already set *before* Apple amplified them with its ad campaigns. On the other hand, the question of its use value in relation to the consumer market was itself unclear. Why should users carry around such a device, particularly in their leisure time? Apple had marketed it to the general but tech-savvy portion of the public under the auspices of creating a new mass market for PDA. Rather than following the traditional narrative of technological diffusion—from an emphasis on business to social uses—Apple attempted to invert this often-repeated sequence. This turned out to be a fundamental flaw in the overall business model Apple developed around the Newton. Although the mass market offers an economy of scale, most consumers could not justify buying such a costly new device. Simply put, its use value (in relation to its exchange value)—whether utilitarian or fantastic—was not apparent.

3.5 PalmPilot Redeems the PDA

The Newton arguably had tainted the market for mobile computers. However resources dedicated to research, investment, and marketing continued to fuel commercial interest. A popular technology marketer and expert of the 1990s and 2000s, Geoffery Moore (who would later be deeply influential to the RIM executives and employees; see McQueen, 2010, p. 168),[94] outlined a path he thought that technologies take from niche to mass market. For Moore, new technologies pass through several stages of acceptance before they reach "main street": "early market"—"a time of great excitement" driven by early-adopter and gadget enthusiasts; "the chasm"—"a time of great despair" in which early-adopter enthusiasm wanes while the "market is still not comfortable with the immaturity of the solutions available"; "the bowling alley"—"a period of niche adoption in advance of the general marketplace, driven by compelling customer needs and the willingness of vendors to craft niche-specific whole products"; and lastly the "the tornado"—"a period of aftermarket development, when the base infrastructure has been

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[94] Moore's work was reference repeatedly in interviews with current RIM employees, particularly those employees involved in "platform strategy."

deployed and the goal now is to flesh out its potential" (Moore, 1995, p. 25). The goal for consumer technology companies, according to Moore, is to convert specialized uses into general, all-purpose uses; that is, to make the "value propositions" (marketing speak for "utility" or "use value") for the professional worker/user align with those of everyday life. Anticipating "the tornado" that precedes mass adoption, "the bowling alley" holds two important principles. First, a company must pick a niche market in which it can capture at least 40% of that particular niche market, creating a "beachhead," so to speak; and second, it must "enlist the support of the economic buyer, the line executive or manager in the end-user organization who has profit-and-loss responsibility for the given function [the] product serves" (Moore, 1995, p. 46). Even though Apple targeted the general consumer by deploying associations with the technological sublime, Moore would have recommended targeting the CEOs and CIOs of large corporations first (Palm, in fact, adopted this strategy early-on; Khermouch, 1997).

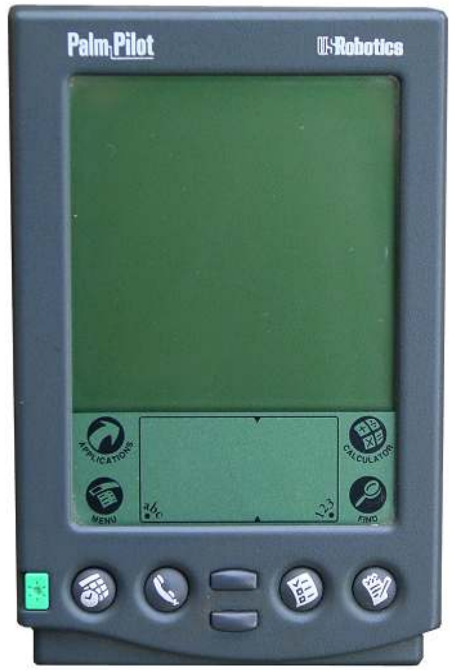

Figure 3: PalmPilot

By 1997, Moore's marketing strategy became the "go-to" marketing text for Silicon Valley startup companies as it clearly laid out a straightforward life cycle of technological products in relation to prospective social acceptance (Saveri, 1997). The introduction of the PalmPilot as a "connected organizer" to the PDA market was partially due to the models and strategies outlined by Moore. However, Palm was unable to emerge from the "tornado" stage for reasons discussed below.

Why did the PalmPilot succeed where the Newton failed? After all, the aesthetic and technical similarities between the two are clear (see figure 2 and figure 3). Their shapes reflected the idea of a digital notepad, both using a touch screen interface requiring a pen-like stylus. Both would recognize the handwriting of the user with the stylus also being used to navigate the device's various applications (many of which were developed by third parties). What "pre-BlackBerry" success the PalmPilot attained in the mid-late 1990s is due to its ability to meld functionality with a technological ideal that gave a technical and symbolic premium to increased productivity and competitiveness in the corporate world. This was something that Newton did not have as Palm's popularity reflected a period in which PC usage was skyrocketing in conjunction with the uptake of Internet participation for business and other forms of production and consumption.[95] Palm's strategy from the outset was *not* to fulfill the science fiction fantasies of average consumers. Instead, it targeted the professional and business user, highlighting pertinent functionalities such as a spreadsheet application that appealed to white collar workers (Butter and Pogue, 2002; 56). A review in the *Wall Street Journal* expressed relief at the successes of the Palm in redeeming the PDA:

> THE QUEST to develop a small, practical, affordable hand-held computer for average users has produced failure after failure. Either the products were aimed at a mass audience and just flopped, like Apple's much-touted Newton, or they were limited to relatively small market niches, like Sharp's Wizard organizer or Hewlett-Packard's 200LX, which are favored largely by gadget-lovers willing to master their intricacies… Finally, however, somebody has come up with a much better idea. It's a new $299 gizmo called the Pilot, from Palm Computing, an innovative Los Altos, Calif., company that has recently become a subsidiary of U.S. Robotics, the giant modem maker. After testing the Pilot daily for a couple

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[95] According to the Computer Industry Almanac, PC desktop unit sales in the U.S. went from 8.4 million (generating revenue $24.5 billion USD) to 33.1 million in 2000 (generating revenue of $86.9 billion USD); worldwide sales figures were 21.7 million in 1990 and 97.8 million in 2000. Over the same period, mobile PC sales in the U.S. went from 1.1 million in 1990 to 10.4 million in 2000; worldwide sales went from 2.4 million in 1990 to 28.5 million in 2000. Available at http://www.c-i-a.com/worldwideuseexec.htm

> of months, I can say it is by far the best little computer I have ever seen and the only one I can imagine incorporating into my daily life. (Mossberg, 1996)

The Palm quickly became a hit in the business community for its business-friendly features and relative usability. By 1999, the Palm's devices constituted 74% of the U.S. PDA market (NPD Intellect, 2000).

Anticipating Apple's successful "app" based strategy, the PalmPilot also was crucial in demonstrating how a self-sustaining *mobile* computing ecosystem might be generated by developing a platform where third parties could develop and monetize applications, thus drawing more money, attention, and usability to the platform itself. Indeed, one of the reasons for Palm's success in this period is that it cultivated a network of third party software developers who might individually profit from selling software compatible with the Palm OS (Butter and Pogue, 2002, p. 159). This distinguished the PalmPilot in important ways from the relatively more gated approach of Apple's Newton and its application ecosystem that had discernable limitations in processing power and functionality while also lacking wireless connectivity. Nevertheless, the emphasis on applications as a *platform* would be central to the mobile strategies of Apple, Google and, later, RIM.

Despite its success in redeeming the PDA as a viable consumer technology, the overall failure of the Palm to become the de facto progenitor of UC (and the success of the BlackBerry in this respect) stems from three interrelated issues. The first, as mentioned, is its rather late adoption of wireless capabilities. By not initially including wireless connectivity, Palm was able to design a relatively sleek, compact device that focused on organization and processing, rather than connectivity. Palm did, however, have experience with radio technologies early on with the RadioMail platform, but due to a variety of political economic issues (see Butter and Pogue, 2002) it eschewed this area of development, looking instead to mobile computing rather than connectivity. Palm's fixed investments thus were not aligned with the goal of enabling wireless capabilities. While working to design wireless gadgetry, Palm did not develop a competitive competency in this area most likely because the company was desperate for funding and, as a result, it played an often subordinate role to entrenched technology companies, including retailers like Radio Shack looking to fill shelves in their stores with new gadgets that had only limited sustainability—relying more on the sometimes passing fascinations of early-adopters than the practical needs of dedicated users (Butter & Pogue, 2002, p. 9). Moreover, Palm's devices were linked to brands like Microsoft and Dell, brands that were not primarily known for their portability. Palm subsequently was unable to fully capitalize (or mobilize) the public's imagination concerning wireless connectivity (e.g., the more fantastic aspects of its prospective use-value). Later, Palm developed its own wireless network—Palm.net—but was unable to generate sufficient consumer demand to establish itself in this area. RIM, on the other hand, had a distinct advantage in developing wireless data technologies from its very foundation (to be discussed in the next chapter). As a result, when rhetoric about the mobile Internet re-emerged in the late 1990s (Cowhey et al., 2008), RIM was well positioned to capitalize on this burgeoning interest in wireless services and devices.

The second issue that distinguished the PalmPilot from the BlackBerry was the choice of interface—touch screen vs. QWERTY—which allowed the BlackBerry to emphasize email as its major functionality with peripheral PDA-like capabilities appended. Although emphasis on email fits into the pragmatic and personalized simplicity of wireless data, it was the divergent application of interface technologies that allowed for its core differentiation. The idea of wireless email had already been considered years previously (by Geoffrey S. Goodfellow in 1982; see Sweeny, 2011, p. 87), but it was the peculiar timing of the rise of the Internet and the exponential growth of email as the "killer app" for "web 1.0" that made the PalmPilot seem outdated once the BlackBerry was released (Okin, 2005). Email was based on a common and widely used communication protocol (mail), and RIM redefined it for the Internet age. By the time commercial wireless email became possible, email already had become a staple of both business and social communication practices (Smith and Faley, 2001).

To take full advantage of this essential communicative norm using wireless data systems, while making this practice mobile and portable, made the choice of the interface decisive. Following Newton, the Palm came to represent an entirely new media technology category (PDA) and likewise emphasized touch-screen technology that was navigable using a stylus (in part because the development of the Newton, though ultimately a commercial failure, entailed key R&D, manufacturing capacity, and a supply chain for touch screen components). Touch screens, however, were still a relatively new feature to which computer users were still becoming accustomed. The BlackBerry, on the other hand, featured a traditional QWERTY keyboard. The choice to use QWERTY was built on existing familiarities with then existing technology, protocol, competency, and other tacit forms of knowledge. Moreover, the choice of the full QWERTY keyboard made the parallels to stationary computers clearer to consumers. In this respect the keyboard emphasizes the active and productive side of wireless communication. QWERTY is now the standard (though an anachronistic) keyboard interface—one that began as a pragmatic solution to a technical problem involving the specific arrangement of the typewriter keyboard in order to avoid keys “jamming” (David, 1985).

In combination with the emphasis on email functionality, the choice of QWERTY is an important transitional precursor to the era of ubiquitous connectivity; an era in which users are both producers and consumers of mobile data. One can cite here McLuhan’s observation that the content of all new media is a previous medium (McLuhan, 1964, p. 23) as portable computing, and UC with it, required QWERTY as a bridge to acceptance. One might also apply this observation to questions of media interface in relation to human capacities—and here McLuhan’s perspective captures both the consumption and production of content. The importance of QWERTY as a transitional interface built on the existing competencies of users was central to enabling and equipping people to become accustomed to consuming and producing data ubiquitously. It therefore makes sense that the keyboard for RIM would be an important piece of intellectual property as well as a key component of the BlackBerry brand identity.

The economic importance of both QWERTY and email can be seen in the patents held by RIM on QWERTY keyboards “optimizing” typing with thumbs.[96] RIM has a specific patent on the organization of the keyboard in an oblong/oval fashion, reflecting the 40-degree angle at which a user’s thumbs interact with the device. This keyboard still

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[96] United States Patent #6,278,442

is an iconic aspect of the brand, giving the BlackBerry a distinctive, patent-protected look and design. In addition to these important features, the BlackBerry employed a scroll wheel that would allow navigation among the device's various applications. Indeed, this feature became just as iconic for the BlackBerry brand as the QWERTY keyboard and its "always on" connectivity. Furthermore, this toggling feature fit well with the overall optimization of the device for input using thumbs.

As the primary data entry point for mobile devices, BlackBerry's QWERTY maximized communicative efficiency and ease of use through its optimization of thumb typing. Fortunati (2005) has pointed out how mobile devices represent artifacts of what she calls a "thumb culture" as a distinct set of cultural practices, forms, and relations stemming from the use of devices controlled by the thumbs (pp. 149-160). Although this characterization certainly reflects the prominence of text-based communication enabled by the QWERTY keyboard, "thumb culture" and "digital labour" are distinctive characteristics of the era of UC. Combined with the global popularity of texting in the wake of GSM standardization, the BlackBerry made such activity a basic element of the workday, but one whose use value was easily translatable to the social lives of users already familiar with desktop computer keyboards.

The third reason why the BlackBerry overtook the PalmPilot and other competitors stems from the political economy of venture capital funding and the unique corporate strategies of the 1990s. Among the most important factors related to this are the roles of institutional financing and public subsidies in supporting (or not supporting) fledgling companies. The comparison between Palm and RIM are quite revealing in this regard. Both were small startups seeking to compete against entrenched corporations—

corporations that outsized them in market capitalization and who were effectively trying to generate new mass markets for mobile computing platforms.

The question of financing startup companies, particularly in emerging technology markets, has been the subject of much academic attention (Lerner, 2009; Bresnahan and Gambardella, 2004). The PDA market, as the example of Palm illustrates, was defined by initial uncertainty and the necessity of securing not only partnerships with established companies but also the capital of large-scale investors in order to conduct the needed research and development. RIM faced a similar struggle early on, one in which the autonomy of its executives would remain a paramount concern as the company sought financing in these formative years, particularly in the mid-1990s when banks, venture capitalists and established technology companies were looking to take advantage of the technology boom by acquiring startup firms. This approach is often sought by startups themselves as a means for technology entrepreneurs to quickly cash-in on their work (Wortham & Rusli, 2010). However, this usually entails a considerable tradeoff once a young company has been acquired by interests not directly involved in the process of innovation. The inability to remain relatively autonomous means the interests and needs of the owners (or creditors) reign supreme—a major contributing factor, it has been argued, to the development of technology investment bubbles (Wortham & Rusli, 2010). Conversely, RIM was able to secure grants and loans from the Ontario and federal governments, as well as venture capital investments that did not have the normal predatory bent associated with Silicon Valley companies (like Palm). These particular financial arrangements allowed RIM to remain more autonomous than most American firms and, for this reason, it was able to focus on building partnerships with manufacturers and telecommunications companies rather than accepting the financial support of third parties with different priorities. I will return to this issue in detail in the next two chapters wherein I elaborate how RIM emerged out of the market conditions outlined in this chapter.

After the failure of Newton, Palm faced the general apprehension of business users regarding the future of mobile computing, especially in 1993–1994 when it sought to bring the PalmPilot to market (Butter and Pogue, 2002, p. 59). Though the company had designed a working model that overcame many of Newton's fatal errors largely related to its usability, it was unable to secure the financing to test and mass produce the device. Palm had just begun to reach profitability when its leadership decided to accept a purchase offer from a leading modem manufacturer called U.S. Robotics (USR). Partly fueled by necessity and partly by a mid-1990s tech-gold-rush mentality, Palm's leadership and founders accepted the offer, making them instant millionaires. Yet the necessity of securing massive industry financing and support through an established global technology company (first USR and then, in 2010, Hewlett-Packard) soon turned into a liability and, arguably, contributed to its decline. Although the investment was necessary (Butter and Pogue, 2002, p. 100), the issue of organizational and creative autonomy subsequently deepened for the Palm division. As USR's primary business of selling modems was yielding slimmer profits, the Palm division was treated by USR executives primarily as a revenue source, rather than as an active area of innovation and development (p. 100). When USR bought Palm the latter already was on its way to dominating the future of PDA but the buyout resulted in a drag on Palm's ability to achieve this potential. This included its ability to respond to the rapid growing popularity of the Internet and the rise of wireless email.[97] By the time RIM introduced its BlackBerry smartphone, Palm was struggling to stay ahead of changing consumer demands, leading to a buyout by HP.[98]

On June 11, 2011, *The Wall Street Journal* ran an article entitled "R.I.P., Palm." The article opens as follows: "Break out your styluses and scribble out a tear. Palm – the Homo Erectus to today's smartphones and tablet computers — is dead." HP, the report said, is stripping "the Palm name from its unit that makes smart phones and tablet computers" literally and symbolically committing it to the high-tech graveyard (Ovide, 2011).

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[97] USR's acquisition by 3Com in 1997 led to conflict between the interests of USR executives and Palm leadership resulting in the departure of Palm's founding executives—who later went on to found rival company Handspring (Butter and Pogue, 2002, pp. 179).

[98] HP acquired palm for $1.2 billion USD in 2010: http://www.hp.com/hpinfo/newsroom/press/2010/100428xa.html

Chapter 4 – The BlackBerry "Solution": Commercializing Wireless Data in North American and the Birth of the Global Smartphone Market

"Early on when we were coming up with the whole idea of the BlackBerry, one of the things that we realized was that a classic entrepreneurial mistake is to try and solve the double serial problem. In other words, we were aware that for us to sell wireless BlackBerry email, we would first have to sell industry on email in general, and then we would have to sell them on the advantage of taking it wireless, taking it with you. So we decided we were going to wait and keep perfecting the product until the email market had grown to a certain maturity, so we wouldn't have to come and sell you on two things. We would just have to sell you on wireless access to email." (Mike Lazaridis, 2008, p. 10)

4 Introduction

As discussed in the previous chapter, the commercial and technical development of ubiquitous connectivity (UC) faced several important hurdles including the competition for wireless data standards and patents, the absence of a saleable end-user device, and a general lack of demand. While portable computing and wireless standardization evolved in parallel, their profitable integration (a key element of UC) eluded most industry incumbents. As early as 1992, a *New York Times* article reported that the "next goal" was "to merge those two technologies into one, to let someone sitting under a tree summon a 10-page document from a laptop computer and with a few keystrokes send those thousands of words through the air to a distant office" (Calem, 1992). The inability of established organizations (e.g., Motorola, Apple, Ericsson) to commercialize UC, despite its perceived inevitability, left an opening for an "end-to-end" solution that could overcome existing barriers.[99] As the example of the BlackBerry demonstrates, this solution entailed a complete system involving hardware, software, and networking infrastructure that enabled the commercialization of UC. In so doing, RIM's organizational identity embraced the myth of UC through the development of core capacities, technical knowledge, strategic partnerships, product development, and brand identity.

In this chapter I provide a historical overview of RIM in relation to the development of the BlackBerry brand of devices and services as emblematic of the broader myth of UC. I map key technical advances, political economic interests, and symbolic changes that by 2006 made BlackBerry a global "brand ambassador" for UC. I position RIM as a (once) powerful organization articulating the convergence of these forces by demonstrating the particular aspects that allowed RIM to produce the BlackBerry brand as both a device *and* a service. While the business necessity and profitability of wireless data is today unquestionable, and without which the unprecedented global popularity of Internet-enabled mobile devices (IMD) would be impossible,[100] the contemporary condition of UC emerged out of a historically specific confluence of technical changes, political economic interests, and symbolic shifts in the context of a widely perceived need for connectivity.

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[99] As the same article concluded, "Thus there is no shortage of technology to allow portable computer users to send data wirelessly, but as is typical of the computer industry, which technology emerges as the standard has yet to be determined" (Calem, 1992).

[100] Globally, wireless data usage is surpassing voice usage (not including VOIP applications), and constitutes a growing percentage (roughly 39%) of revenues for telecom operators (Fitchard, 2012). Since 2009, voice traffic has stabilized at roughly 150 petabyters per month while mobile data usage went from roughly 100 petabytes per month in 2009 to 700 petabyters per month in 2012 (Ericsson, 2012, p. 12).

One significant example helps contextualize the rise of the BlackBerry as a panacea for the problems faced by telecommunications companies seeking new revenue streams centered on wireless data. In July of 1993—the year Apple launched its ill-fated Newton and also the year in which RAM Mobile Data introduced a Mobitex network in the United States[101]—President Bill Clinton participated in a demonstration involving the wireless transmission of an email. Using AT&T's EO Personal Communicator, the event served as a lead-in to a speech detailing Clinton's new policy regarding the commercial use of wireless spectrum (Andrews, 1993). While AT&T's device itself had little commercial success, the public relations stunt did allow the President to send an email wirelessly to Vice-President Al Gore directly before giving a speech in which Clinton offered 200MHz of prime spectrum—the equivalent of 33 TV stations—for auction.[102] The stated purpose was to "develop the most advanced commercial wireless

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[101] At this point costs of use were relatively high with handset costs of approximately $1,300 USD each and services charging $5 USD for a "typical text-filled fax page" of roughly 25,000 transmitted characters (Calem, 1992).

[102] The Clinton administration's decision to use auctions to re-allocate spectrum was controversial partly because it broke with existing United States policy for licensing spectrum (either through "luck of the draw lotteries" or "comparative hearings"; Andrews, 1993). Between 1993 and 1997 the FCC held a series of spectrum auctions for *narrowband* (to be used for advanced paging and messaging services) and *broadband* (for voice and data services), resulting in 4,300 licenses and $23 billion USD in revenue for the U.S. Treasury Department (FCC, 1997, p. 1). Clinton's approach can broadly be defined as favouring competitive bidding for spectrum. Reflecting upon this policy shift in 1997, Clinton's appointed FCC Chairman, Reed Hundt, claimed that, "for the first time ever the FCC truly follows a market-based approach to the allocation and use of spectrum" (Hundt, 1997). Hundt also claimed that as a result of this policy approach, "Wireless investment has increased more than 250% since 1993 and over the next ten years will total more than $50 billion. It is the largest single investment in a new, non-military technology in American history" (Hunt, 1997). Such inflated perception of profitability can drive up costs to unrealistic levels, as happened with the European 3G auctions where it resulted in $185 billion euros in corporate debt (Ure, 2002, p. 129). Critics of the auction approach (Longford, 2008) have argued that it favours large private (often incumbent) interests while weakening overall commitments to public interest or oversight. A reporter for the industry trade publication *Communications*, warned that auctions would "prevent small entrepreneurs from entering the brave new world of the wireless revolution" (Baugh, 1993). Part of the rational for commercializing spectrum in this way depended on the myth of UC as both a desirable and inevitable future, one that would offer heretofore new areas of economic growth and technological innovation (Calem, 1993).

communication networks the world has ever known. It will allow an industry to grow by tens of billions of dollars by the end of the decade, producing hundreds of thousands of new high-skilled, high-wage jobs” (quoted in Campbell, 2012). Introducing the “Emerging Telecommunications Technology Act” as the “information equivalent of the Alaskan oil or the California gold rush,” Clinton explained to both the media and American citizens the significance of this decision by proclaiming, “We have entered a new era of human communications where wireless technologies become information skyways, a new avenue to send ideas and masses of information to remote locations in ways most of us would never have imagined” (GPO, 1993).[103] Spectrum capacity now was readily available for commercial exploitation. This freeing up of spectrum, combined with existing interest from computer and telecommunications industries, strengthened the myth of UC and with it the search for saleable devices and services.

Given this context, my argument is that RIM was not only the first and, at the time, most concentrated and tangible articulation of UC, but that its “BlackBerry Solution” overcame a significant economic problem: how to collectively monetize new wireless data capacity, spectrum, and devices. Indeed, RIM’s entire brand is intertwined with the symbolism of UC as producing, selling, and branding *always on, always connected* technologies and services constitute its core commercial identity. At the same time, the institutional culture at RIM, including its technical capacities, funding, and organizational structure, reflected this myth.

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[103] The full speech is available at http://www.gpo.gov/fdsys/pkg/WCPD-1993-07-26/html/WCPD-1993-07-26-Pg1418.htm

This chapter provides background on the genesis of this institutional identity, the technical and political economic hurdles that shaped the development of the BlackBerry, and its evolution into a defining global brand bound up with a mythic articulation of UC.

4.1 RIM's Origin Myth: The Search for Efficiency in Wireless Communication

Like many corporations in the ICT sector, RIM and its supporters (e.g., telecommunications carriers) have constructed a mythology that highlights the extraordinary conditions by which it came to prominence. While such mythologies reflect and are perpetrated through corporate branding, in this section I highlight a few notable elements of the official "story" (as captured in corporate biographies and the business press) and then contextualize them within the specific political economic conditions that give rise to seemingly exceptional institutions.[104] Part of the corporate mythology associated with RIM is related to its founder and former co-CEO, Mike Lazaridis, who is often credited as the company's chief visionary and *de-facto* head-engineer. This often told corporate story goes as follows:

Mike Lazaridis, a child of Turkish immigrants, grew up in Windsor, Ontario, and demonstrated an interest and aptitude in electrical engineering and software design at an early age. Like many children of the 1960s and 1970s, Lazaridis had been a science-

[104] Though some of the more important historical antecedents are addressed in the previous chapter, RIM and other prominent companies like Apple or Google are shrouded in self-produced myths regarding their purported exceptionalism, which obscures the political economic foundations of their success. Often times this can backfire. For example, the mythology of the exceptional nature of Nortel in the ICT industry contributed to high expectations that resulted in its ultimate collapse. See Macdonald (2000) and then Hunter (2002) for a telling contrast regarding how corporate myths can ultimately be self-defeating.

fiction fan, particularly of the original *Star Trek* television series and its futuristic technologies (Woyke, 2009).[105] As Sweeny writes, "*Star Trek's* futuristic tools inspired [Lazaridis and friends] to start some serious tech tinkering. Mike and [childhood friend] Ken Wood even decided to see whether it was possible to build force fields using wires, switches, and chemicals" (Sweeny, 2009, p. 32).[106]

As the main visionary of RIM (as well as its founder and primary economic beneficiary), Lazaridis settled on the name of the company after hearing a sports announcer describe a football play as "poetry in motion." The resulting name "Research In Motion" was meant to signal the company's forward-looking emphasis on constant *innovation* (a resilient buzzword). Moreover, it was meant to reflect the chaotic pace of technological research as an evolving field where industrial needs and demands change rapidly—a condition for which RIM was prepared to 'hit the ground running' regardless of the problem (Howitt, 2013). Indeed, much of RIM's early contract work reflected this dynamic problem-solving business model, one requiring a wide range of technical skills and competencies to survive.

Founded in 1984, RIM quickly emerged as an early pioneer specializing in various forms of ICT-related problem solving. The first fifteen years of RIM's existence, before the introduction and success of the BlackBerry, was comprised of primarily short-

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[105] In addition to all of the futuristic gadgetry depicted in the original *Star Trek*, the show regularly highlighted two portable and wireless communication tools: the communicator (a wireless device for voice communication) and the tricorder (a portable computer with wireless capabilities). *Star Trek's* influence on engineers, scientists, and futurists has been documented elsewhere (Foresman, 2010).

[106] This early fascination with the future translated into an interest in cutting-edge developments in physics and high-tech; as a multi-millionaire executive Lazaridis became a philanthropist of scientific inquiry, notably donating millions to the foundation of the Perimetre Institute for the study of advanced physics attracting, Stephen Hawking as one of its distinguished research chairs (http://www.perimeterinstitute.ca/).

term contracts with a range of clients. Over the years, increasingly, RIM provided specialized expertise to corporations in response to logistical problems involving the commercial movement of goods and information.[107] Consequently, in the years before the BlackBerry, RIM acted as a jack-of-all-trades when it came to finding logistical fixes for their clients. Yet despite the diversity of their contracts, including the DigiSync film synchronization technology for the National Film Board that won RIM two Academy Awards for technical achievement,[108] it was wireless data that ultimately emerged as a unifying focus for the company.

For the first fifteen years Lazaridis often worked as an engineer on many of RIM's contracts. His early fascination with the futuristic possibilities of wireless transmission, like many other Canadian wireless pioneers (e.g., Reginald Fessenden and Alfred Gross), contributed to the development of core competencies in this area.[109] However, this interest in and aptitude for wireless transmission was not enough to translate into a successful commercial endeavour. As a student at the University of Waterloo (he would drop out in his third year), Lazaridis was directly exposed to

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[107] This emphasis on logistics is also important within the context of post-industrial myths as the rapid explosion of ICTs after 1980 was in part due to the search for ways to save on the transportation costs associated with the movement of goods (especially given the dependence on oil controlled by OPEC). Similarly, the logistics of information flows also related to the management of an increasingly dispersed workforce. In some specialized cases, the product was knowledge or other creative goods and services—intangible products that could either be inputs into the production process or finished goods suitable for a consumer market.

[108] www.blackberry.com/select/get_the_facts/pdfs/rim/rim_history.pdf

[109] In 2008, Lazaridis was inducted into the "Canadian Telecommunications Hall of Fame" in the inventors and innovators category alongside Alexander Graham Bell and Reginald Fessenden. Founded and funded largely by Canadian corporate interests and industry trade groups (Canadian Wireless Telecommunications Association, Information Technology Association of Canada, IEL Satellite Group, and RIM, among others), the CTHF appears to be a deliberate attempt to create a myth-making apparatus (under the veneer of "national pride") operating specifically on behalf of Canada's technology sector. See www.telecomhall.ca

ARPANET (the backbone upon which the Internet and the World Wide Web were built) due to a co-op placement at a branch of the supercomputer maker Control Data Corporation (CDC) (Lazaridis, 2008, p. 5). At the time, this type of network was incredibly rare with limited access for people outside of academia and the military (Mattelart, 2003, p. 54).

In addition to his exposure to packet-switched networking technologies like ARPANET, Lazaridis also had an opportunity to observe the use of electronic mail (later known as email) at CDC. The use of email within this organizational context influenced Lazaridis' thinking about the commercial prospects of email, which he came to see as a system that could be applicable to organizational communication more generally (Lazaridis, 2008, p. 10). From then on, he became a devoted email user, projecting that it would become a central business communication tool (p. 10). By the mid-1990s, email became a fundamental component of RIM's own organizational culture (Sweeny, 2011, p. 36) and later of corporations globally (Dresner, 2008, p. 5).

At this time, one major problem prevented the ubiquity of the Internet and email: no company had conclusively demonstrated the commercial viability of wireless data. What was still needed was a product (a device or service) whose utility could be clearly demonstrated to potential consumers. RIM's response to this hurdle was several years in the making and stemmed from its narrowing focus on wireless that combined innovations in software, hardware, and service culled from its years of contract work.

The first idea Lazaridis and RIM developed was a system for allowing text to be transmitted wirelessly to a video display. The intent was to provide a commercial system for updating point-of-sale information in retail settings. Named “Budgie,” this early system was sold as a complete package that included both hardware and software components. Yet the Budgie system, although an important technical precursor, failed to gain any significant support from retailers (Simone, 2012).

Although the Budgie system did not reach commercial success, it did lay the groundwork for RIM’s relationship with an important client: General Motors (GM) Canada. In 1984, GM was searching for an effective way to disseminate and display information on the factory floor—a space where verbal commands or audio prompts were often drowned out by industrial noise. Though Budgie was effectively a commercial failure it did provide the basic circuitry and set-up for GM’s purposes (Sorensen et al., 2012). The application of this system in the industrial context foreshadowed a shift in how labour can be managed using wireless technologies. For example, wireless transmissions of data displayed on LED screens (like information about safety hazards or assembly line slowdown/stoppage) demonstrated the usefulness of these data flows in managing a dispersed workforce. In this context, wireless data was used to improve productive efficiency, flexibility, and the management of workers.[110]

Though the wireless dissemination of data on the factory floor helped RIM develop its reputation in the industrial context, according to the “official” story, the seeds for what would later grow into “the BlackBerry Solution” were planted when Lazaridis

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[110] As noted in chapter 3, the use of wireless communication for organizational communication and labour management was identified by other corporations like AT&T, IBM, and Motorola. These applications were primarily for internal uses, particularly for communicating with field engineers or other mobile workers, and were not developed to be sold commercially. Similarly, military applications of wireless technologies have long been used to coordinate troops and supplies.

attended a talk in 1987. The talk, given by an unnamed representative, was given by an official from Japan's NTT DoCoMo—a national telecom operator and mobile innovator responsible for developing the i-Mode platform (hardware and software), a Japanese smartphone platform that foreshadowed the BlackBerry. The speaker speculated about the application of wireless data signaling between vending machines and suppliers. This logistical application suggested a *push* functionality that allowed vending machines to transmit information to suppliers when stocks were getting low (McQueen, 2010, p. 59).

Push technology of this sort could reduce circulatory costs of commodities by facilitating the *just-in-time* (JIT) delivery of stock.[111] This straightforward premise pertaining to the logistical or circulatory movement of goods helped identify the broader commercial application of wireless data in the context of electronic communication. Instead of vending machines sending messages to supply centers, the push-based approach could be used to develop a new wireless system using Internet Protocol to guide the flow of data to individual users. With the ability to push data wirelessly, individuals could, for the first time, be assigned IP addresses linking organizations to the Internet through wireless data connectivity. Users would become nodes or relay points in the coming ubiquity of the Internet enabled by a push-based wireless standard that could be adopted by existing telecommunications providers.

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[111] JIT or *kanban* strategies were imported to North America from Japan and South Korea during the 1980s. This historical link foreshadows the way in which UC technologies, like the BlackBerry, extend the applicability of such techniques to the realm of communication, social relations, and cultural reproduction. Indeed, this influence has been noted in relation to the popularity of the i-mode smartphone platform in Japan (Buckley, 2010).

My treatment of this official story ends with Lazaridis and his team of engineers realizing that wireless data systems hold the potential to make communication more efficient, less-expensive, and ultimately profitable for both RIM *and* its strategic partners in the global telecommunications industry. However, developing a more context-neutral wireless data system required specialized knowledge that would subsequently enable the coordination of software, hardware, Internet protocol, and wireless signaling—skills that were relatively under-developed at the time. Perhaps more importantly, it would require partnerships with established companies operating in different niches within the global ICT market.

4.2 Towards a "Solution"

Despite the celebratory corporate narrative stemming from RIM's founder Mike Lazaridis (Lazaridis, 2008), the development of the push-based wireless system that gave rise to the BlackBerry was not just about 'visionary' innovations or 'eureka' moments born from a singular individual or corporation. Rather, as outlined in the previous chapter, these developments are a function of increasingly global market dynamics, global consumer (particularly professional business-oriented users) expectations and, crucially, strategic partnerships with incumbent companies seeking new ventures that supported RIM. The company's growing specialization came amidst the rollout of a wireless infrastructure across North America and a search by telecommunication carriers for a way to generate return on investment (ROI).

In the following section I discuss how the pre-history of the BlackBerry brand of devices and services was defined by technical and commercial problems. What would become "the BlackBerry Solution" developed out of partnerships with incumbent telecommunications providers, intra-firm co-operation and investment, and the creation and utilization (by RIM) of specialized technical knowledge. In this section, I address how the initial investment in Mobitex architecture by Rogers and Ericsson enabled RIM to develop its proprietary software and networking capabilities around the Mobitex standard. In the subsequent section, I focus on the role of Intel and Bell South in the development of an end-user device. In each case, the participation of these larger incumbents was animated by the technical and commercial realization of UC. Importantly, the section deals with the necessary investment in the myth of UC, as well as its technical and commercial realization, by a range of corporate interests.

While cellular services focusing on voice telephony were spreading rapidly in markets within North America during the 1980s, wireless data services involving the digitization of content and the usage of packet-switched network protocols were still something of a novelty. Few companies in North America had expertise in this area (Motorola being an exception) and those that did relied on European companies like Ericsson and Nokia (Rogers, 2008).[112] In the mid-1980s Rogers' telecommunications division (Rogers Cantel) in Canada was beginning a costly and somewhat controversial (debt-financed) investment in wireless infrastructure[113] that emphasized voice

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[112] The European advantage in supplying 2G infrastructure stems from the decisions made in the early 1980s (beginning with the Conference des Administrations Europeenes des Postes et Telecommunications in 1982) by the European Commission to adopt a single digital standard (initially only thirteen nations signed). This resulted not only in the European adoption of the GSM, but also in the creation of a European supply chain for infrastructure and devices with enough excess capacity for export (see Gandal et al., 2003).

[113] Under Ted Rogers (who, in 1994, controlled 90% of Class A voting stock and 32% of the equity in Rogers Communications), the company was averaging $300 million CDN in annual capital expenditures on

transmission, putting it into direct competition with existing dominant telecommunications companies like Bell Canada (Fierheller, 2010).[114] As a condition of allowing Rogers to buy spectrum and develop a commercial wireless network, the company was required to purchase its infrastructure components largely from Canadian companies. The initial Canadian supplier, however, could not deliver the volume of needed components/infrastructure by the agreed upon date[115] and, despite the wishes of the CRTC and federal government, Rogers sought a deal with Swedish firm Ericsson (a pioneer in wireless technology and an instrumental company in the development of the GSM standard). In exchange for contracts, Ericsson agreed to create research and development facilities in Canada (Fierheller, 2010).[116]

Though voice telephony was the most important focus of Rogers' partnership with Ericsson, this relationship also enabled the introduction of Mobitex to North America. As described in the previous chapter, Ericsson, in conjunction with Teliverket, at the time was developing and marketing the Mobitex wireless data standard for global

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cellular and cable infrastructure, creating $3.2 billion CDN in corporate debt (versus $445 million in equity) (Osterland, 1994).

[114] The Canadian regulatory approach to building a competitive wireless market did not give incumbent telecommunication providers a first mover advantage. By comparison, in the United States the "baby bells" were able to build their wireless networks before competitors could enter into their respective markets. While the former approach leveled the playing field for new entrants, it put pressure on Rogers to have infrastructure in-place simultaneously covered the twenty-three wireless markets outlined by the CRTC (Rogers, 2008).

[115] Rogers had purchased spectrum licenses to operate in 23 markets across Canada, but was required to launch services in each simultaneously (Rogers Cantel, 1991).

[116] The bulk of Rogers' capital investment in mobile network capacity/infrastructure, particularly in the upgrade to 2G in the early 1990s, was acquired from Ericsson. The entire national cellular infrastructure was based around Ericsson's CMS-8800 system technology (Rogers Cantel, 1991, p. 4). Between 1983 and 1991 capital investments in cellular infrastructure totaled over $900 million CDN (p. 4).

customers (primarily telecommunications companies) in conjunction with its work on the GSM. In addition to the hundreds of millions of dollars his company spent on a national wireless network, Ted Rogers, the CEO of Rogers, pushed for investment in a wireless data infrastructure based on the belief that it constituted the future of telecommunications profitability.[117] In 1989, during a period of debt-financed investment across Rogers' various telecommunications holdings,[118] Rogers Wireless acquired the basic infrastructure to establish a Mobitex network in Canada.[119] Though wireless voice telephony was still a growing industry and demonstrated clear profitability, wireless data was based on a vision regarding future needs, applications, and technologies that were yet to be determined. The network was built on a speculative ideal about what *could* be possible. When it first bought into the Mobitex standard, Rogers was one of only three telecommunication providers outside Sweden to invest in a wireless data network.[120]

Before the commercialization of Mobitex could happen, however, Rogers and its American Mobitex counterpart, RAM Mobile Data, faced two significant barriers. The

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[117] According to one account, the events surrounding Rogers' acquisition of Mobitex proceeded as follows: "One day [in 1989], he [Ted Rogers] was visiting his system supplier LM Ericsson in Sweden and noticed a wireless data terminal in the cab that the taxi company was using to dispatch calls to their drivers. Ericsson [executives] told him that it was the next big step in Wireless services and showed him their new Mobitex network technology. Rogers decided to buy into the system, and in early 1989 he hired Tom Pirner to head up Cantel's new Data Communication Division. Pirner set about installing what was to be North America's first public wireless datacom network" (Sweeny, 2009, p. 41).

[118] Rogers Cantel, the mobile communication division of Rogers, invested heavily in new infrastructure under Ted Rogers' leadership, particularly in the years (1988-1993) surrounding the acquisition of Mobitex. Much of this investment was enabled through debt; for example a line of credit expanded from $150 million CDN in 1987 grew to $1.1 billion CDN in 1991 (Rogers Cantel, 1991). Fixed capital assets in network and radio channel equipment increased substantially during this period from $400 million CDN in 1989, $775 million CDN in 1990, to $900 million CDN in 1991.

[119] Mobitex investments totaled $24 million CDN by March of 1991 (Rogers Cantel, 1991, p. 7).

[120] RAM Mobile Data, a Mobitex provider in the U.S., acquired the standard from Ericsson in 1992 and built a Mobitex network in the fifty largest U.S. markets.

first was the high cost of terminals and receiver boxes (whose costs were between $8,000 and $10,000 USD each). This limited its market to specialized emergency response and security uses. The second was a deficit of software applications for the network partly due to the general absence of an application programming interface (API) upon which developers could build the platform (Livingston, 2008, p. 147). In other words, the pool of developers for wireless data using Internet protocol specifications was extremely limited because the skills required were still highly specialized there was a limited the commercial incentive to support the research needed to develop them. This absence of suitable skills was, at the time, a *general* problem in developing wireless data networks, further narrowing the pool of developers for Mobitex as a *specific* standard (Livingston, 2008, p. 147). These two barriers—the lack of affordable receivers (handsets) and relevant applications (e.g., calendar, contact manager, email) —were deeply interrelated. Expanding the range of available applications would broaden the appeal of wireless data. This in turn, would expand its commercial viability by drawing more investment into the development of software useful to a broadening range of consumers.

It was at this juncture that RIM's reputation in wireless data came to the attention of Rogers. Robert Fraser, a telecom consultant who wrote the "Mobitex terminal specifications" paper cited in the last chapter,[121] was hired by Rogers to work with RIM to develop a portable device to run on the Mobitex network (Sweeny, 2009, p. 41). Before these devices could be built, however, RIM had to develop the basic software applications—particularly the API—through which other, more sophisticated uses could

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[121] In the paper, Fraser outlined four possible terminals, including the "personal communicator" that could be built to use the Mobitex standard.

be developed for the Mobitex network.[122] In short, there were still several missing links between hardware and software.[123] To begin addressing these, RIM developed two important applications: a wireless chat program "MobiTalk" and an application that managed the radio modem while also allowing multiple applications to be run at the same time named "MobiLib" (McQueen, 2010, p. 62). MobiTalk would lay the foundation for the development of email transmission over the Mobitex network and the BlackBerry Messenger service that allowed BlackBerry handsets to communicate with each other. MobiLib also enabled different types of digital data to be transmitted and received wirelessly by controlling the radio transceiver. As Sweeny explains, "This was the world's first wireless communication API (application programming interface). It led to all subsequent APOs [sic] for all types of smartphones, allowing for developers to create programs for online app stores on various operating systems" (Sweeny, 2009, p. 42).[124]

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[122] McQueen explains the importance of this innovation:

> Previously, any programmer trying to create a new application for Mobitex had to reinvent the wheel every time by writing code for all the routines, right down to the initial handshake to acknowledge contact whenever a PC connected with a data radio modem made by Ericsson or Motorola. The other complicating factor was that a user could only run one Mobitex application at a time. After the call from Rogers, RIM set out to create an application programming interface (API) used to link hardware and software. (McQueen, 2010, pp. 61-62)

[123] As part of its spectrum licensing agreement, Rogers committed 2% of its cellular revenue to research and development activities. Though this period involved a rapid accumulation of debt through the investment in fixed capital, it was also a period of cellular revenue growth. In 1986 Rogers had 17,000 subscribers, in May of 1991 Rogers had 294,000 subscribers. The average monthly subscriber revenue averaged $91 CDN at the end of 1991 (Rogers Cantel, 1991, p.3). Rogers Cantel investments in R&D were $1.4 million CDN in 1988, $23 million CDN in 1989, $5.6 million CDN in 1990, and 1.1 million CDN in 1991 (Rogers Cantel, 1991).

[124] That the American Mobitex provider RAM Mobile Data would ultimately draw on these developments to commercialize its own massive network demonstrates the importance of RIM's crucial early contribution (Weeny, 2009, p. 42).

Figure 4: Ad for RIM's MobiLib API (1990)

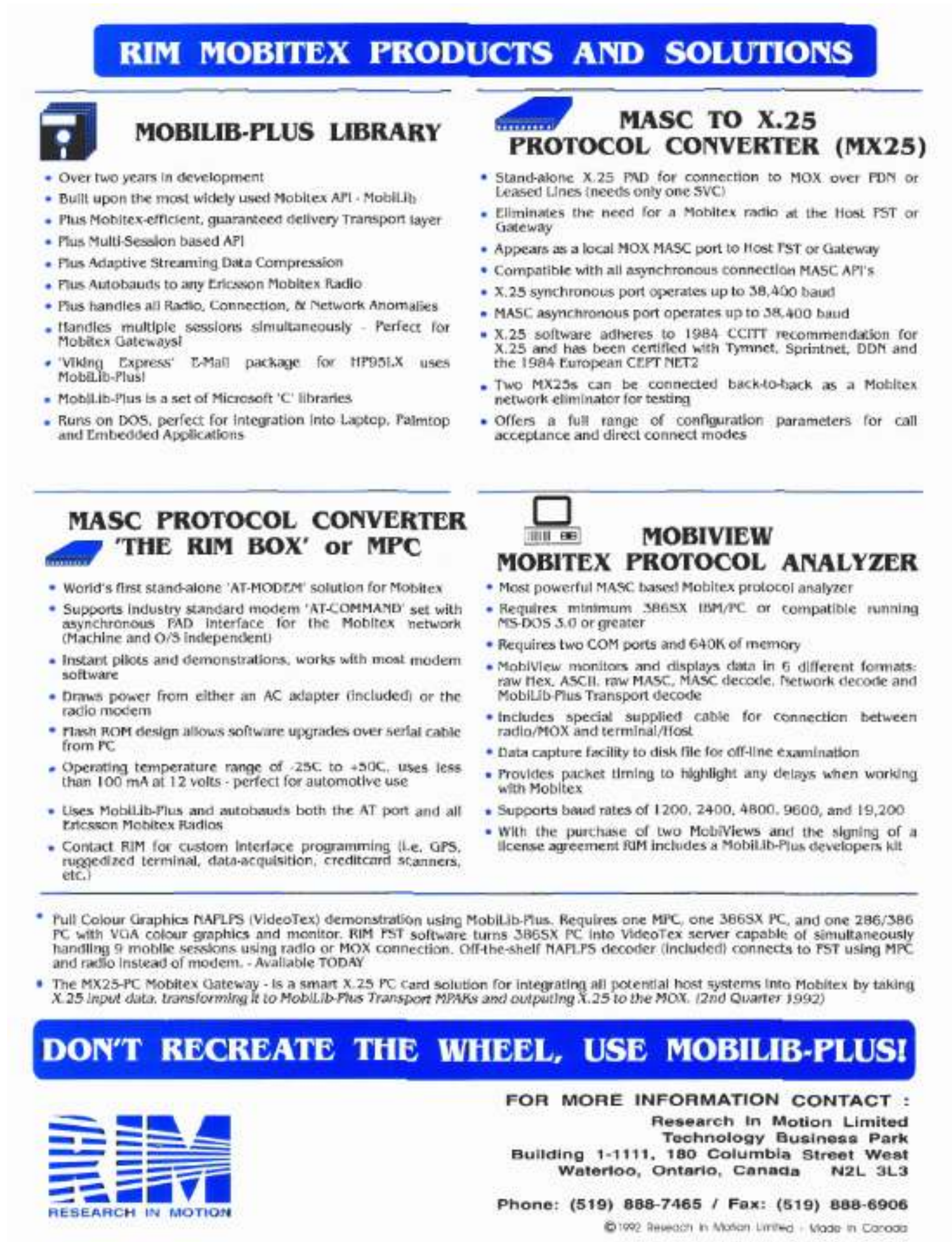

Figure 5: Ad for RIM's various Mobitex products and solutions (1992)

Figure 6: Product ad for RIM's Mobitex Protocol Converter (1990)

At the same time that it was developing the basic APIs for the Mobitex network, RIM expanded its software and network engineering competencies to create interoperability with the existing global packet-switched network X.25—a network supported by the International Telecommunications Union (ITU)[125] and used more widely by telecommunications carriers (Mathison, et al., 2012; Rybczynski, 2009) to deliver wire-line data transmission services (e.g., Minitel; see Deprès, 2010). Before the Internet was widely adopted outside of the U.S., X.25 was the main standard by which computers could communicate with each other globally, but it had yet to be developed into an effective wireless application. What resulted from RIM's efforts was a hybrid that linked the existing X.25 network with the emerging Mobitex infrastructure. Named MX25, this hybrid created a larger, more integrated network allowing data transmitted and received wirelessly to have access to a broader array of potential connections (McQueen, 2010, pp. 63-64).

Out of this hybrid standard, RIM developed a commercial package named "RIMGate" that provided software allowing Mobitex users to link into existing commercial hosts such as Compuserve or AT&T EasyLink (p. 64). This innovation effectively made wireless Internet connections more than just possible. It also made them commercially profitable when RIM packaged them for use by existing Internet Service Providers (ISP). RIMGate thus became the central means of commercializing Mobitex, making RIM an important intermediary within the bourgeoning wireless data market because it was able to "solve" basic technical problems as well as synchronize them with existing commercial interests (i.e. telecommunications providers, ISP, component and infrastructure manufacturers). Moreover, the resulting Mobitex Gateway, an all in one package for organizations wanting to set up networks that included the wireless

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[125] First approved by the ITU in 1976. See http://www.itu.int/en/ITU-T/studygroups/com17/Pages/history.aspx

transmission of data, laid the foundation for the BlackBerry Enterprise Server—one of the most important and profitable products RIM would produce (RIM, 2010, p. 9).[126]

Despite spending more than $30 million USD on its Mobitex network, Rogers merged its data and paging divisions in 1992 which put Mobitex on indefinite hiatus (Rogers Cantel, 1993).[127] Even with Rogers' unwillingness to develop the Mobitex network, RIM was able to leverage its niche understanding and experience to secure more lucrative contracts. In 1992 Ericsson released the world's first wireless email device and service package named *Viking Express*. Relying on the software developed by RIM, the *Viking Express* system combined an HP-95 palmtop computer with a portable modem. As a result, in 1993 Ericsson contracted RIM to build complementary hardware components optimized for their Mobitex software.[128] This was decisive for RIM as it allowed the company to develop the intra-firm capabilities, investments, and knowledge needed for designing and producing a device that *integrated* the software they had largely created.[129]

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[126] The ability to create organization-specific wireless data networks allowing for the remote management of workers (as discussed in the next chapter) was crucial for the broader commercial acceptance of UC.

[127] Rogers was not the only company scrambling for a commercial application of the Mobitex standard. In response to RIM's development of the Mobitex Gateway RAM Mobile Data "decided to issue a request for proposal (RFP) for a new two-way send-acknowledge Mobitex pager, that would behave like…instant messaging" (Sweeny, 2009, p. 45). Amidst the early press coverage around PDA with the launch of Apple's Newton, the development of a Mobitex pager could build upon growing consumer awareness. However, the Newton was a failure, and due to still existing technical limitations nothing came from the RFP at the time. Setbacks notwithstanding, the exercise drew RIM deeper into overcoming the technical barriers preventing the commercialization of wireless data.

[128] The contract was for "2,500 Mobitex Protocol Converters (MPC), a modem that relays messages between corporate computers and Mobitex paging networks" (McQueen, 2010, p. 83).

[129] The production of wireless data modems for Ericsson exposed clear limitations in the existing component hardware. In the process of fulfilling its contract(s) with Ericsson, RIM discovered that the existing design of the modems was built from a patchwork of component standards. Rather than the components being integrated and optimized, they were layered on top of each other almost haphazardly, contributing to limitations in performance and power efficiency. The initial design handed down from Ericsson led to regular malfunctions because the hardware was not optimized to work with RIM's more

It also involved a plan to make these data modems more energy efficient, thus making them potentially less bulky and more portable. However, because RIM was contracted as an original equipment manufacturer (OEM) supplier,[130] the resulting modem would be sold and re-branded under Ericsson's name.[131]

4.3 Intel and Bell South—The Inter@ctive Pager

The popularity of PDAs like Palm in the mid-1990s renewed industry hopes that Mobitex could be made profitable through the development of an end-user device. Increasingly telecommunications providers were becoming Internet service providers (ISPs) in order to adapt to a new global media system based on Internet Protocol (IP) and the World-Wide Web (Fransman, 2002). North American providers like Rogers and

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advanced software. Another element in the wireless modem—energy consumption—was grossly inefficient compared to what technologies like traditional cellular phones could offer; not coincidentally, a primary reason why in 1992, Intel's CEO dismissed the idea of a viable two-way pager (Sweeny, 2009, p. 46). In theory, data transmission should be *more* efficient per bit than voice because of its asynchronous nature. Moreover, digitized wireless data has greater spectrum efficiency precisely because it can modulate data asynchronously.

[130] This emphasis on radio frequency lead to another OEM project for RIM developing a "Type II PCMCIA" card named "Freedom" that could be inserted into a laptop to enable travelers to check their email from anywhere (McQueen, 2010, p. 90).

[131] Interestingly, the first real device to allow RIM to fuse its expertise in software and hardware to make a mobile point-of-sale terminal built around Ericsson's radios (McQueen, 2010, p. 85). The resulting device could be used in large sports arenas to sell concessions to consumers at their seats. Although not a huge seller, Toronto's SkyDome (now Rogers Centre) was one of the first major purchasers to implement the system. The project was terminate in 1995, a year after it had begun, but the value of wireless payment and point-of-sale terminals foreshadowed the more recent interest in mobile payment systems. In particular, this project brought yet another area into the production and design mix: financial institutions. Building this mobile payment system required partnerships with financial institutions and emphasized the importance of data security and encryption as central features (a key reason why the BlackBerry would become so popular with governments and corporations). See http://docs.blackberry.com/en/admin/deliverables/12873/Standard_BlackBerry_message_encryption_193608_11.jsp

RAM Mobile Data recast Mobitex as a symbol of the next phase in the Internet's evolution, one defined by both mobility and ubiquity (Fierheller, 2010). At the height of the dot-com boom in 1998, Rogers and Bellsouth Wireless Data[132] had made investments building the trans-continental Mobitex network even though it had been relegated to internal or specialized uses like emergency services. This North American Mobitex network still lacked a marketable device. Because RIM had been integral in helping develop the North American Mobitex network protocols and hardware, the creation of a wireless data device fell to them once again.

In 1996-1997, a series of discussions took place between RIM and three major telecommunications providers in North America: AT&T Wireless, Bell South, and Rogers (Tubbs & Gillett, 2011).[133] These providers were interested in capitalizing on growing demand for a wireless Internet "solution" (Romero, 2000)—one that could both monetize existing investment and prospectively create a new category of wireless devices and services. Email had already become the "killer app" for the wired Internet and these early meetings returned to the idea of an email device that could be "worn" ubiquitously (Tubbs & Gillet, 2011, p. 26). Given its initial success, email thus demonstrated the "value proposition" of the Internet as a medium of communication for new users (Freeman, 2009).

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[132] RAM Mobile Data, renamed when it was sold to Bell South in 1995.

[133] Bell South would later be merged into Cingular wireless, and ultimately become part of the reformed AT&T when Cingular merged with Southwestern Bell. Like Frankenstein's monster, the resurrected AT&T would go well beyond its original namesake (the one dismantled by the original anti-trust suit) in its ability to dominate both domestic and international telecommunications markets often because of its size and market capitalization.

Before it could move beyond the prototype phase, RIM faced several obstacles that required partnerships based on an emerging confidence that the resulting device would be profitable. The first concerned the scale of production necessary to ensure profitability, which meant that the device had to be adopted by both major North American Mobitex carriers in order to secure a large enough market of potential consumers/subscribers. After demonstrating the usability of the initial prototype to executives at Bell South, as well as at the high-profile PCS tradeshow in 1996, a deal was struck to finally bring the device—renamed the Inter@ctive Pager—to market in 1997 (Sweeny, 2009, p. 61).

This decision was contingent, however, on reducing the high cost of producing the custom chip and to make it small enough to be mobile and energy efficient, yet sophisticated enough to run necessary applications. Bell South's decision to adopt RIM's device helped overcome this second barrier. For it to be portable, compact, and functional, the device required a specially designed chip matched to the technical specifications of RIM's prototype. Because of its dominance of the semiconductor industry, only Intel could provide the requisite components. Intel's primary business focus was on supplying chips for desktop PCs. Producing wireless chips to specifications set out by RIM meant company resources would be funneled towards an unproven market. With Bell South's direct participation, RIM's device would have access to a potentially massive subscriber base and, as such, Intel agreed to produce the necessary chipset (Tubbs & Gillett, 2011, p. 64).[134] Intel's decision also was partly motivated by its own in-house application of RIM's prototype within its workforce. In 1996, based on renewed interest from the major Mobitex operators, RIM developed a prototype two-way pager that could operate on the Mobitex network. It was known simply as RIM 900. These initial prototypes were bought by Intel for its employees, but the program itself was also designed by members of the "Embedded Microprocessor" division to persuade Intel executives to re-allocate research and development funds towards chipset RIM required to improve the functioning of its next generation of devices (Tubbs & Gillett, 2011, p. 51).[135]

A third problem was largely symbolic, involving product differentiation in a market filled with mobile devices ranging from pagers to PDAs—devices often associated with some form of wireless connectivity. Rather than competing with a high-end PDA like Palm, RIM concentrated on branding and designing the wireless email device as an Internet-enabled two-way "super-pager." The pager market was less competitive (Lindmark et al., 2004) and, as such, the introduction of an email-based pager featuring a full QWERTY keyboard could be positioned to stand out. While it featured some of the same applications offered by a typical PDA—personal information

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[134] Commitments from Intel and Bell South were based on the belief that a wireless device was both possible and profitable. See Tubbs and Gillett, 2009.

[135] These prototypes also were used within RIM's own workforce, yielding deeper insights into both the social and professional uses of their device. "It was given to employees to use at work, but Mike Lazaridis soon noticed that people loved to be able to stay in touch outside work hours, at the shopping mall, or as they picked up their kids from soccer games" (Sweeny, 2009, p. 60).

management (PIM) synchronization,[136] for example—it differed, to repeat, in its market positioning as a two-way pager featuring email synchronization and crucially a QWERTY keyboard for the *composition* of messages. This was significant because few pagers allowed the users to produce relatively detailed text messages, even when they allowed two-way communication.

Figure 7: RIM Inter@ctive Pager.

Offered on Rogers and Cingular in 1997-1998, the Inter@ctive pager was successful enough to justify Intel's research and development investments into the microchips required for the next generation of RIM's device (Tubbs & Gillett, 2011, pp.

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[136] PIM is a crucial component of the personalization of mobile and wireless devices involving the management of information specific to the user like schedule, calendar, contacts, phone numbers, documents, and other forms of information unique to the user.

94-102).[137] As RIM touted in its 1998 annual report, the Inter@ctive pager was named Top Product for 1997 by *Wireless for the Corporate User Magazine* in the category "Innovative devices: voice and/or data," and its initial success resulted in a larger order in 1998 worth $70 million USD.[138] In assembling the pager, RIM had developed what would be important strategic partnerships with some of the most influential companies in wireless telecommunications and mobile computing. Although the BlackBerry name and branding strategy had not been settled upon, the basic technical barriers had, by 1997, been overcome.

4.4 Branding the BlackBerry "Solution"

"As time went on we saw that this a la carte idea that you would buy technology from one and bolt it to another and tape it all up together, that wasn't working either. So we discovered that we really needed to integrate everything together seamlessly and provide a complete experience. It wasn't enough to just hand a device to somebody. It had to be hooked up and working out of the box. We endeavored to make sure that the device worked out of the box and it was reliable." (Mike Lazaridis, 2008, p. 11)

Having produced a working prototype, secured important partnerships with component manufacturers and telecommunications providers, and mass-produced the Inter@active Pager, RIM's leadership proceeded to create a brand identity with an accompanying narrative that would make its devices and services inseparable from the

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[137] Intel's R&D expenditures increased during this period from $1.3 billion USD in 1995 to $2.7 billion USD in 1998 (Intel, 1998). There was a specific increase of 14% between fiscal 1997 and 1998 associated with micro-processor product development and manufacturing (Intel, 1998, p. 30) partly associated with the development of mobile computing components (p. 30). By 2000, R&D investments in mobile computing chips and assets became a key part of Intel's overall business strategy (Intel, 2000, pp. 36-41).

[138] http://web.archive.org/web/20070928101543/http://www.rim.net/news/press/1998/pr-07_01_1998.shtml

still new market for wireless data. One of the most important elements at this point was making a broader case that the BlackBerry brand would be profitable for telecommunications carriers, many of whom had made large investments in purchasing spectrum that had been opened up for new wireless services.[139] An interview with David Smith, former Nortel employee and current Vice-President of Product Development at RIM offers insights on this early period where the BlackBerry brand developed in conjunction with the search by telecommunications companies for ways to monetize investments in spectrum, particularly in light of the auction-based approach initiated by the Clinton administration discussed at the beginning of this chapter.

> I started using the Blackberry in 1999, just after it came out. At the time I was at Nortel networks. I was in a research group that was looking at the future of wireless technologies; how wireless is going to evolve. At the time carriers were undergoing a transition from 2G voice-only to GPRS [2.5G], as well as investments in 3G, purchasing costly spectrum, as well as thinking about what features they would want, and what infrastructure they would need. At this point in time, in 1999, you'll see the carriers, particularly in Europe spent billions in spectrum to allow them to buy 3G spectrum.
>
> While at Nortel, we were working with carriers to help them understand the value proposition that 3G networks would enable for them…looking at concepts and ideas about how carriers could use that spectrum once they had it. Picture

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[139] For example, the first spectrum auctions held in the U.S. in 1994 were to be used for paging services and generated $1 billion USD. This was seen by policy-makers, both in the U.S. and globally, as a success for the auction approach (McMillan, 1995, pp. 198-199).

postcards, video conferencing, calendaring etc…Because in 1999 all there was was SMS, voice calls, and to some extent you could use your phone as a tether [mobile internet for laptops or PDA]. And then RIM came out with the Blackberry. At the time, this was very intriguing because on one single device it showed a glimpse of the future. I thought, "Ok now I don't need another device." You could use that device as a way to see the future. We [Nortel] did some joint marketing with RIM, because what it [the BlackBerry] did was allow us to paint a picture of the future for telecoms. When people saw it, when people saw BlackBerry, even in 1999, they instantly recognized that this will change how people work, how they connect with people, their ability to network, consume data, entertainment, news…enable all those things to happen and they will pay for that ability.

The way you have to look at bandwidth and spectrum, is that it's exactly the same as real-estate. The telecom companies own the spectrum, and they want to make sure they don't become disenfranchised in the same way as ISPs [internet service providers] did. At one point, they [ISPs] felt they could play a much stronger role in the content, like AOL Time Warner, but failed and ultimately turned into bit pipes, or "dumb" pipes. The challenge for wireless telecoms is not to become bit pipes in the same way. We at RIM are very interested in helping them play a strong part in the value proposition for the end user. Different telecom companies have different ways of dealing and looking at it. We try to tread lightly on their network. We try to be very efficient with their network, so they can maximize the users on their networks, rather than turning the user's

> device into a full-fledged computer that has no bandwidth efficiency whatsoever that is just sucking down multi-MB data, with no compression, which is the opposite of treading lightly. The reality there is real physics at play, the bandwidth is limited. (personal communication, June 24, 2010)

As Smith highlights, one of the major constraints faced by handset developers like RIM is the amount of spectrum controlled by wireless telecommunications providers. Commercially exploiting this newly available spectrum required painting a picture of future possibilities regarding potential devices and services. Indeed, how these providers choose which handsets to allow on their networks is directly related to their ability to convert costly investments in spectrum into revenue. In North America, telecommunications providers play a significant role in choosing and promoting handsets to consumers because they subsidize the costs of handsets through multi-year contracts between carriers and consumers. For this reason, the fates of telecommunications providers, handset manufacturers, and mobile developers are intertwined though, given the high spectrum costs, the balance of power rests with the providers (see Kenney & Pon, 2011).

The first annual report after RIM's initial public offering (IPO) in 1997[140] offered its corporate narrative of UC—a narrative crafted to reflect the company's indispensability to consumers and the telecom providers that would profit from the devices monetizing their network capacities. The message was not overly complex,

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[140] The 1997 IPO generated $115 million CDN and was listed on the Toronto Stock Exchange (TSE). RIM was listed on the NASDAQ in the January 1999 and generated $258 million USD through the sale of five million shares (RIM, 1998; RIM, 2000).

reflecting the influence of ICTs on the rhythms of everyday life. Communicating to investors, employees, and prospective consumers the company's newly established corporate narrative, the report proclaims, "*In a world where consumers increasingly demand to be 'connected' 24-hours-a-day for both business and personal purposes, the economical cost and benefits of RIM's core two-way paging technology give it a significant competitive advantage over the limited applications of one-way products which cannot respond to or initiate messages*" (emphasis added, RIM, 1998, p. 4). Not only was the device positioned as one designed for UC, it also was portrayed as a device for both consuming *and* producing wireless data.

The next step was to develop a brand identity that reflected the unique "value proposition" (i.e., use value) offered by RIM's new device—one meshed with the future needs of wireless telecommunications providers. After some consultation with branding experts and product designers (Colpatino, 2011), the name "BlackBerry" was adopted in 1999 as a means of distinguishing the device from others existing in the market. The name, rigorously tested in focus groups by Lexicon Branding,[141] was partly chosen as an ideographic reference to how the QWERTY keyboard of the device resembled the fruit, and partly chosen because linguistics research suggested the appeal of the double "B" sound to focus group participants (MacNamara, 2012). The BlackBerry brand was to be all encompassing: it was simultaneously a device, a complex technological system, and a service enabling individuals (whether as professionals, entrepreneurs, or as part of the larger workforce) to remain connected at all times. While the brand was associated to the

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[141] Lexicon Branding also was responsible for coming up with Intel's "Pentium" brand as well as Apple's "PowerBook" line of laptop computers. See www.lexiconbranding.com

physical device, BlackBerry represented, symbolically, a *service* that provided and personified UC (RIM, 2001). Though the devices themselves were expected to evolve, growing in technical and functional sophistication over time, the basic service and its connotations could remain the same, indefinitely tied to the BlackBerry brand name.

No longer a pager *per s*e, the newly branded BlackBerry 850/950[142] was released in January of 1999 on multiple carrier networks in North America.[143] One of the most important selling points, highlighted by David Smith, was the ability to *push* data to users so that there was not lag time between when users are notified about a new message and when they open that message. For this to happen, the BlackBerry device emitted a "heart beep" that would communicate its location to the nearest base station at regular intervals, allowing data to be transmitted to the handset as soon as it became available.[144] The push-based system RIM had been working on for years became a central and defining feature of the "BlackBerry Solution," allowing personal information to find its designated receiver regardless of where they are in space. Arguably, it is this particular technological

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[142] The numerical distinction between the 850 and 950 referred only to the network standard upon which it operated. The 850 worked on the ARDIS network, while the 950 worked on Mobitex. The branding strategy, which involved close ties with the telecommunication carriers offering BlackBerry devices on their networks, was an essential part of appealing to "mobile professionals" as these prospective users are more "in tune" with brand "positioning" and "viral marketing campaigns" according to then Vice-President of Marketing at RIM, David Werezak (Young, 2000).

[143] As Sweeny explains, the package for the 850/950 included the device,

> with typical PDA organizer software (calendar, address book, task list), along with a docking cradle and synchronizing software to connect with a PC. E-mail was encrypted using Triple DES and remained encrypted at all points between the desktop PC and the handheld device…The BlackBerry was the first wireless device that synchronized with company mail systems so that users did not need a different e-mail address when traveling. This was a very big selling point….The 950 cost more than $500 (including activation fee). Cost for the service was an additional $50/month. (Sweeny, 2011, p. 71)

[144] The significance was that getting messages did not requiring dialing in to make a connection because, "As soon as you entered a coverage area, the 950 would start pulling or sending mail automatically" (Sweeny, 2009, p. 66).

innovation that made UC a question of perceived immediacy (since there was virtually no gap between getting the notification of new email and actually accessing that email). Indeed, the ability for the BlackBerry to be used almost anywhere in space, and then to use that location to push wireless data, set the stage not only for the mobile Internet but also for an existential condition in which bursts (and flows) of information can interrupt daily life virtually everywhere and at anytime.

Email was still central to the BlackBerry's design and ultimate appeal. RIM thus launched the device in conjunction with major email client services across North America (e.g., Microsoft Exchange), meaning users had options regarding which email services they could use and synchronize with their BlackBerry (RIM, 2001). For such email services, the BlackBerry service allowed the synchronization of one email inbox between handset and email client. In this way, an individual's email became truly ubiquitous because a message received on the handset would be registered on the email client, and likewise with a message sent on the handset. Thus a user would not have a separate "mobile" email account for their wireless device (e.g., RadioMail) but, instead, use one email across devices (thus the same email could be synchronized on both on a desktop and a device).

4.5 Searching For a Market: The BlackBerry Means Business

Given that there was no clearly established market for the BlackBerry, building a market required identifying early adopters that would not only see the value in RIM's device and service but also help grow its prospective market. RIM's strategy was partly shaped by the failures and limitations of both Newton and Palm. Following the model laid out by Geoffrey Moore (discussed in the previous chapter), the marketing strategy for the BlackBerry first focused on seeding the device with high profile executives, many coming from the financial industry or Silicon Valley—industries where timely messaging was deemed to be extraordinarily valuable. This strategy was intended to both build word of mouth among elite early adopters and, perhaps more importantly, lead elite users (like CIOs[145] or IT Administrators) to pressure larger institutional clients into buying BlackBerrys in bulk to equip their workforce. As Carayannopoulos explains,

> RIM identified corporations and their employees, particularly those handling time sensitive information such as financial services, as its target market. Anyone who needed quickly to receive and react to new information was a likely customer for the product. Corporations were more likely both to find value in its product and to purchase it, whereas individual consumers would view it more as a luxury item. Furthermore, it would be easier to sell the BlackBerry to an organization given RIM's limited resources for marketing, as acceptance by an organization meant that many more users would potentially be adopting it with each agreement. (2005, p. 224)

RIM's executives believed that these elite professionals would clearly see the value in UC as it helped them cope with the chaotic rhythms of the global financial and high-tech markets of the late 1990s. "RIM took a grassroots approach to building brand awareness for BlackBerry. Sales people were dispatched as wireless e-mail evangelists to

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[145] In some institutional contexts this position is known as Chief Technology Officer. While there are some differences in these two titles, for my purposes there is enough similarity that I will only use CIO to encompass both.

educate Fortune 1,000 companies about the availability of an enterprise-class solution for wireless e-mail" (Elkin, 2001).[146] An early review for the device describes the appeal:

> Made by Research In Motion–based in this city, which barely shows up on anyone's map of the tech industry—the BlackBerry is still nothing but a flea in the broad handheld computer market. There are fewer than 200,000 users—less than 1% of handheld computer users. But it's whipping through the ranks of high-tech CEOs, venture capitalists and financial analysts. Rabid fans include Marimba founder Kim Polese, tech author Don Tapscott and tech investor Roger McNamee. Merrill Lynch gave BlackBerrys to its senior analysts. Former Baywatch babe Pamela Anderson has one. So does Toronto Blue Jays first baseman Carlos Delgado. Howard Stern has raved about his on his radio show. (Maney, 2001)

Interestingly, this review categorizes RIM's device in terms of the "handheld computer" market rather than the PDA or pager market, suggesting the uncertainty around the new market RIM was trying to cultivate. Industry specific applications like those in finance, law,[147] or information technology led to the professionals in these

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[146] VP of Brand Management Mark Guibert guided the targeting of the BlackBerry brand at professionals "who value their time and have discretionary budgets" (Wasserman, 2001, p. 46). Part of the brand strategy, however, involved convincing these potential consumers since, at the time, email was not intuitively considered a "time-sensitive method of communication" among focus group participants (p. 46). Taking a cue from Apple, Guibert "formed a team of about 75 'evangelists' to target Wall Streeters" and sent BlackBerrys to "editors of IT pubs like *Information Week, InfoWorld* and others" (pp. 46-47). As Guibert explains, "The idea was to tightly focus on [IT] decision makers, but also to create a supporting buzz behind it…Even if we'd been in *The New York Times* once as a product feature, we'd try to get in again as a lifestyle story" (p. 46).

[147] For example, in 1999 law firm Gibson, Dunn & Crutcher LLP, adopted the use of BlackBerrys. Chair of the Technology Committee for the firm explained the choice:

industries becoming the fastest adopters of the BlackBerry (RIM, 2000); that is, sectors in which activities, decisions, and actions had to be made immediately for the sake of competitiveness and/or profitability. Some early applications for the 850/950 included stock monitoring and trading abilities (RIM, 2000). Thus the BlackBerry's core functionality—"always on" connectivity, push email, and a QWERTY keyboard—reflected the speed and urgency of timely, round-the-clock flows of information. These features came to express not only the needs of individuals, but also anticipated the needs of enterprises and their increasingly mobile or remote workforces and clients.

Figure 8: BlackBerry 950

> Responsiveness is critical to our success. When clients retain an elite law firm like GD&C, they expect easy and constant access to our lawyers, particularly during a crisis. With BlackBerry, even when our lawyers are traveling or otherwise out of their offices, they can be in touch with their clients. We also use BlackBerry to stay in touch from depositions and court rooms where cell phones aren't an option. (Anonymous, 1999f)

As elite business users began to adopt BlackBerrys in growing numbers, RIM poured more effort into developing and marketing its BlackBerry Enterprise Server (BES). While the BlackBerry was most visibly expressed as a singular handheld device, the BES was marketed as an integrated technological assemblage comprising end-user devices, network servers, back-end support, software and hardware; in sum, it was a "total package" that allowed any corporate client to implement a secure wireless strategy with relative ease and speed. The BlackBerry Enterprise Server enabled total data and network synchronization across a mobile workforce. It allowed for a level of customization according to the client organization's information, security, and networking needs. BES therefore forged not only a large potential market for RIM to exploit, but also solidified the economic necessity of wireless strategies for competitive advantage (RIM, 2000). At the end of February 2001, 2,800 companies in North America were using BES (RIM, 2001, p. 10), and in 2003 the number of these servers that were installed by corporations globally exceeded 10,000 (RIM, 2003, p. 4). By 2005 the number reached 42,000 (RIM, 2005, p. 6).

As a result, RIM tapped into a bourgeoning market segment known as business-to-enterprise, or B2E.[148] Emerging alongside the growth of the Internet and the tech boom of the 1990s, B2E comprised ICT makers and service providers looking to sell the

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[148] The growth of B2E as a discernible market segment is tied to the growth of mobile ICTs and the creation of an increasingly mobile workforce. As Southworth summarizes,

> …the term B2E was first used in 1999 in a series of marketing campaigns for the Palm Pilot by 3Com Corp.…Providing employees with Palm Pilots so they can work according to their own hours is one B2E service…Others can include setting up company portals so employees can access news and information and even, in some cases, watch their children at a company daycare through the use of a Web cam…If mom isn't worried about her kids getting good daycare, she'll be more productive. That is the reasoning behind B2E. (Southworth, 2001)

values and virtues of their devices to businesses seeking competitive advantage. The growth of this market segment is also partly attributable to the growing role played by the Chief Information Officer (CIO) in developing and implementing ICT-based corporate strategies (Stenzel, 2011). B2E marketing was geared specifically to winning over this crucial figure given that he or she could make or break a product line. While word of mouth was important in advertising the value of the device to executives, targeted marketing to specific CIOs led to the adoption of these devices within organizations as tools for both professionals and, eventually, as tools to be used by their more general workforces. More specifically, such devices were pitched as means of coordinating the activities of employees separated by huge distances or tools for implementing labour management strategies that require constant connectivity and responses when prompted (Southworth, 2001). As examples, brokerage firm Credit Suisse First Boston, which agreed to buy hundreds of pagers in 2000, was followed by deals with Intel, and then Salomon Smith Barney, to equip their respective employees (Ingram, 2000).

As RIM vice-president of product management David Smith explained, while RIM's commercial success relied on its adoption by businesses and governments, this also allowed for the development of the device's and service's utility. Smith noted that what began as a device "designed for CEOs" also was being used by their families. The two most important technical characteristics, according to Smith, were security and network efficiency:

> The main reason why we have been successful with corporations and governments has been our level of security, and integration; for example, with Microsoft Exchange, Lotus Notes etc… that's why we have been so successful.

That's why you can get your corporate email, it's really the security credentials that make the difference. The last thing a CIO wants is to have their device or email hacked or broken into. So we make sure we get all the appropriate certifications, certifications that are very strong, and globally recognized. So our devices are used by government offices and corporations all over the world. People don't have to worry about their data, it's encrypted end to end, and without the secret key there's no way to break that.

One of the reasons our devices are so popular with telecoms…is because the Blackberry was invented on a network that only has 9.6kbs shared, so there was very little bandwidth available. So when we designed the original system, it was designed with the concept of a network operation center (NOC) that would actually manage the encryption and transmission to the device, you could actually compress and encrypt the information to the device, and you could also very carefully manage the status of the device so that the network managers could actually be aware of the status of the device, and as long as it could accept it, the network center operation could push data to the device. With BlackBerry, because of the network operation center with the BlackBerry Enterprise Server that all knew the status of each other, it could be very efficient; it would know the status of the device. The BlackBerry Enterprise Server, if the device is available, would actually push the 2kb to the device and would not notify the user until the whole message is already on the device. It was all designed in a very efficient way to use a network that had almost no bandwidth. We've applied that same methodology to web browsing etc…to drive the efficiency of the Blackberry solution. So it is

> very efficient today, it is a very "lightweight" device so the carrier can run a lot more devices on the same spectrum, something they've spent a lot of money acquiring. (personal communication, June 24, 2010)

Security features, though essential to corporate clients, were also essential technical aspects in personalizing each device. The use of advanced encryption and unique device identifiers (e.g., PINs) were meant to ensure that messages sent and received reached only intended users.

While large corporations were sought because of the substantial orders they could place, RIM also targeted entrepreneurs and small business professionals. In a feature article that appeared in both *The Globe and Mail* and the *Boston Herald* titled "Entrepreneur Grabs Latest Handheld Technology", the popularity of the BlackBerry is explained in terms of how the device empowers such users (Healy, 2000). One businessperson is quoted as saying the BlackBerry was his "greatest freedom-provider ever". Another interviewee notes how the device is perfect for venture capitalists because it mirrors their typical "attention deficit disorder" stating the BlackBerry "has totally influenced the way I get business done" (Healy, 2000). Indeed, the professional and small-to-medium business (SMB)[149] market had been an important growth sector for the early development of IMD. An interviewee describes the importance of the BlackBerry to Entrepreneurs and SMB employers and employees: "The BlackBerry is now my watch, my alarm clock, my scheduler, my timetable, my to-do list, my contact list and my internet wireless communication device" (Wintrob, 2001). Perhaps more interestingly,

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[149] Generally SMB refers to businesses with less than 100 employees.

the same person describes the wireless feature as “the closest thing to mental telepathy” (Wintrob, 2001).[150]

The development of these two business markets, B2E and SMB, provided the BlackBerry with a solid consumer base upon which RIM could expand its service and product lines.[151] The success of the BlackBerry in the business market reflects a continued transformation of both institutions and workforces in light of more powerful and portable ICTs. For example, according to a survey by *Network Magazine* conducted in 2001, “about 71% of 250 large U.S. enterprises said they planned to buy or support the purchase of PDAs for their employees” (Vermono, 2001). In that same year nearly 8,000 companies implemented BlackBerrys in their workplaces, including roughly 700 in Canada (RIM, 2002).

The business market offered the clearest opportunity for the BlackBerry to become profitable and, more importantly in the development of UC, this success established its role as a core agent in the future development of devices and network services. Thus, paralleling its focus on business clientele, RIM began dedicating resources to creating a consumer market through a combination of strategic partnerships

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[150] As John Durham Peters (1999) has lucidly documented, the mythology of unmediated communication has a long history. Radical changes in communication technologies, for example the telegraph, are often linked to a perceived supernatural augmentation of human faculties. For example, Harvard Physicist and Morse biographer, John Trowbridge wrote in 1899, “Wireless telegraphy is the nearest approach to telepathy that has been vouchsafed [“revealed”] to our intelligence” (quoted in Peters, 1999, p. 104).

[151] Industry research firm Gartner estimated in September of 2003 that there were 100 million SMBs worldwide, representing a “total IT market worth $350 billion [USD]” (Brown, 2003). By 2004, SMBs accounted for 26%, or $8.96 billion CDN, of IT spending in Canada (Tournemille, 2004).

and expanding the functional capabilities of the BlackBerry.[152] Expanding RIM's market to include younger, non-business consumers also was meant to maintain its growth despite the pending saturation of BlackBerrys in the business market. RIM also pursued the youth market in order to sell its surplus devices accumulating in its warehouses (Bell, 2000; Chu 2000). Demonstrating the value of the BlackBerry to non-business consumers required RIM to pour more resources into branding, marketing, and advertising. According to Leitch (2000), greater expenditures in this area lowered overall profitability and contributed to the volatility in its stock price during the summer of 2000. This volatility reflected a declining profit rate due to greater funds being shifted away from research and development towards promoting the BlackBerry brand to a broader audience of consumers.[153]

New products were developed to broaden the BlackBerry's appeal. In April of 2000 RIM introduced the 957, a device that bore a clear resemblance to existing PDAs, particularly the Palm Pilot. Unlike the Palm Pilot, however, the 957 offered a full QWERTY keyboard, wireless e-mail, scroll-wheel, and PIM-synchronization applications. The device retailing for almost $500 USD, enabled users to read larger emails and display more text on screen, including web-based content (Austen, 2000).[154]

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[152] In 2000, RIM made several high-profile deals include one with AOL, then one of the most valuable companies in the world. The AOL deal was meant to bring the BlackBerry to a youth demographic, but notable problems related to AOL's stock valuation delayed this effort (see Chu, 2000).

[153] By late 2000 some analysts were already characterizing the BlackBerry as a transitional device, rather than a genre defining one, and expecting a much larger competitor to displace it (Ingram, 2000).

[154] At the time of its release competitors included the Palm Pilot Vx , Compaq iPaq (running Pocket PC OS designed by Microsoft), and Handspring Visor (running Palm OS but produced by the rival faction of Palm founders that left after disagreements with owners, USR).

Consequently, the speculation about future BlackBerrys often highlighted the device's expanding functionality in terms of the transformation of work itself:

> The next generation BlackBerry will run Java and can become essentially a remote control for everything on your office PC. You could use it, for instance, to tell your PC to find certain PowerPoint slides and e-mail them directly to a projector in the room where you're about to give a presentation. Operating on high-speed wireless networks now being built, the next BlackBerry can also be used to make voice calls. "I believe it has the power to be the catalyst to usher in the distributed workplace," says Stephen Hall, general partner with Axalon Ventures in New York and a BlackBerry user. "Physically being in the office and plugged in is no longer necessary." (Maney, 2000)[155]

While early RIM devices like the 850/950 heavily relied on strategic-seeding and word of mouth to generate sales, the 957 was accompanied by a major advertising push that would articulate the ubiquitous developments that BlackBerry embodied—developments primarily targeted at business users but also positioned to incorporate other potential markets.[156] The slogan, "always on, always connected," was part of an

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[155] Later versions of the BlackBerry, beginning with the 5800 (discussed below), incorporated both voice and data networking features, but also a software architected specifically designed enable the expansion of applications (in this case, Sun Microsystem's Java Micro Edition) (Sutton, 2001).

[156] The relative success of RIM's pagers, particularly the 957, lead to the purchase of a new manufacturing plant in 2000 that would produce BlackBerrys five times faster when it began operating in the following year (Chu, 2000). Employee growth between 2000 and 2001 reflected the expansion of RIM's BlackBerry brand. The number of R&D employees grew from 186 to 331; sales and marketing grew from 120 to 309; and manufacturing expanded from 136 to 403 employees (RIM, 2001, p. 3). R&D spending rose from $12.2 million CDN in 2000 to $25.7 million CDN in 2001 (p. 5).

extensive public discourse on UC that shaped RIM's corporate identity as well as the bourgeoning PDA market (Wasserman, 2001).

The marketing campaign for the BlackBerry 957 was the first concerted campaign led by RIM and not by carriers (RIM, 2001). The campaign captured the essence of the BlackBerry brand, reinforcing a narrative that not only valorized "always on" connectivity but also depicted the device as a necessary tool suited to the Internet-age of global ICT markets—a mythos in which the speed of information was a defining characteristic, requiring new tools of adaptation.[157] A series of ads circulated in 2000 and 2001 appearing in Canada's *The Globe and Mail* are paradigmatic of this overall narrative. One advertisement depicts a man on a golf course checking his email, while another shows a woman lost at sea in a rubber dingy presumably sending a distress message with her 957 (figure 9). More telling still is an advertisement that depicts a man narrowly avoiding a knife thrown by some unknown assailant; the message on the BlackBerry screen simply reads "DUCK!" (figure 10).

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[157] It is worth noting that a large portion of the advertising targeted at consumers was and is conducted by telecommunications providers rather than handset vendors since it is the former that stand to benefit directly from the use of a specific device within a given geographically defined market. In this case I am only focusing on the advertising in which RIM was involved directly.

Figure 9: Print ad for BlackBerry 957 in the Globe and Mail, August 4, 2000.

Figure 10: Print ad for BlackBerry 957 in The Globe and Mail, September 19, 2000.

Advertisements during this campaign often alluded to, and made light of, the addictive nature of wireless email. For example "It comes with an off button. No one uses it, but it comes with one" (figure 11); "If you're planning an intervention for someone addicted to one, may we suggest you use e-mail" (figure 12); "You shouldn't use it in the shower. You'd think we wouldn't have to say that." Each of these ads describes the BlackBerry as a device with "highly addictive wireless e-mail."

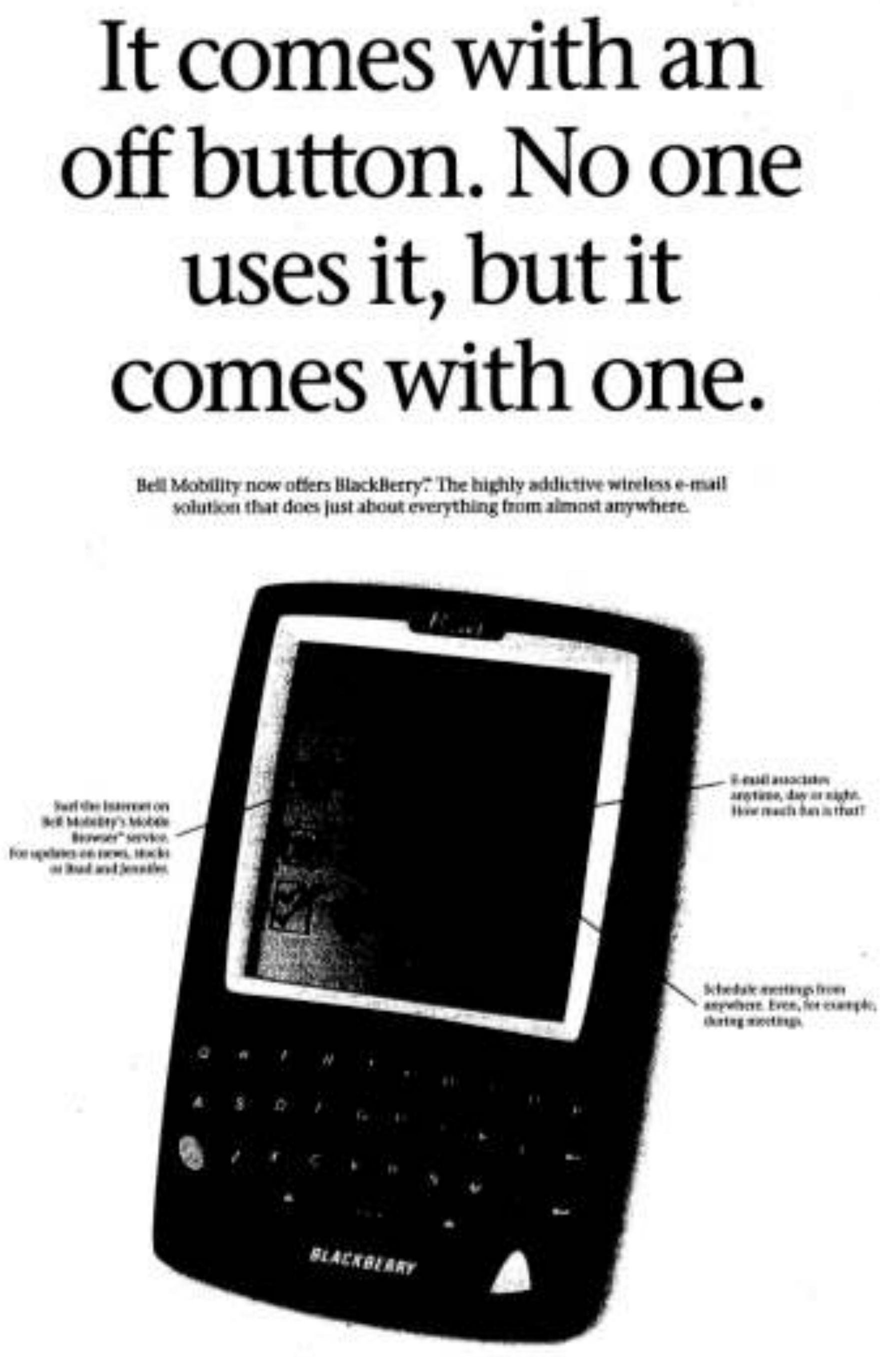

Figure 11: Print ad for BlackBerry 957 appearing in The Globe and Mail, April 5, 2001.

Figure 12: Print ad for BlackBerry 957 appearing in The Globe and Mail, April 6, 2001.

Though developed for a broader market, the 957 also was designed to appeal to existing B2E clients, in part because its outward design was comparable to conventional PDA. A *Forbes* magazine reviewer of the RIM 957 provides anecdotal evidence of the BlackBerry's popularity among financial firm executives:

> A small handheld e-mail device is the hottest electronic gadget to hit corporate America in years. But can it survive against the big boys? There's good reason Research In Motion's handheld electronic organizer and e-mail device called BlackBerry is known as "crackberry." People at the 5,000 companies that use the system act addicted, thumbing away on the wireless gadgets throughout meetings, at boring client dinners--even during visits to the rest room. That's why employees at one Wall Street firm are being cautioned not to take their BlackBerrys to the john. The IT folks fear they might accidentally drop the $500 gizmos in the toilet--mid-e-mail. (Gallagher, 2000)

Another review in *The New York Times* made similar claims about the value of the BlackBerry to professionals and executives:

> The BlackBerry is the forerunner of a set of tools that offer constant contact without the need to actually talk to anyone. About a million Americans use a wireless e-mail service, with BlackBerry leading the pack, according to the Yankee Group, of Boston, a telecommunications consulting firm. In recent months, the BlackBerry has become much coveted by America's business professionals, who are increasingly judged by how accessible they are to colleagues and clients. A key draw: unlike cellular phone calls, which require a clear distraction of attention, BlackBerrys allow users to do two things at once. Internet executives rave about watching messages roll in while they conduct other business. Along with higher salaries and concierge service, BlackBerrys headed a list of demands submitted by junior analysts at Salomon Smith Barney to their superiors last spring. Even lawyers, notoriously slow to embrace e-mail in the

office, have become enthralled by the BlackBerry. (Harmon, 2000)

From this early success, competition followed. Out of competition, however, the Blackberry was differentiated as a status symbol. By the beginning of 2001 BlackBerry was competing directly with Motorola's two-way pager Talkabout (figure 12) which, by that time, had reached almost one million users. The competition between the two demonstrated how the market for such devices had become segmented according to the symbolic differences among user groups (Century, 2001). [158] Motorola became the brand of choice for hip-hop and NBA users (and their respective fans), while the BlackBerry was most used by executives, politicians, and gadget enthusiasts. As testament to its success as an essential business tool, in 2000 *Forbes* magazine named the BlackBerry one of seven "cult brands" (a list that included Ben and Jerry's and Nike) (RIM, 2001).[159]

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[158] A reporter for *The New York Times* explains this segmentation in terms of two markets for the device:

> Two wireless systems, two passionate camps. The rectangular, rigid BlackBerry is the choice of a high-tech and financial elite, including Bill Gates, Michael Dell and the investment bankers at Goldman, Sachs. They would not be caught dead carrying a fire-engine-red or cobalt-blue Motorola Talkabout, which the company markets to young adults -- even teenagers passing e-notes in class. You have to understand that white-collar workers and politicians don't want sexiness or cuteness -- they don't want fashion," said James Balsillie, the chairman and a chief executive of Research in Motion, which makes the BlackBerry. Why does Al Gore live on his BlackBerry? He needs something that's reliable, and he needs something that's secure. BlackBerry devotees insist they go for substance over style. '"I use BlackBerry over Motorola for the functionality,'" said James Andrews, an Internet entrepreneur. "For a lot of people who have Motorola, it's their first entry to an e-mail address. But I'm a techie. Motorola sort of feels like a toy." (Century, 2001)

[159] Because of the central role it played in Wall Street culture, I would be remiss to not mention role of the BlackBerry in the events surrounding 9/11. Because of the unique technical features offered by the BlackBerry, and its proliferation among professionals in and around the World Trade Center, it played an important role in the lives of victims and survivors. Indeed, BlackBerrys enabled communication during a crisis where traditional communication networks became congested or dysfunctional—in part due to its use of the Mobitex and DataTAC networks separate from the collapse/jammed cellular networks. As a result, the BlackBerry gained respect among government and emergency workers. This was in addition to regular users who were hearing stories communicated in the mass media about how the device helped rescue survivors, coordinate relief missions, or relay last words from victims trapped in burning buildings. Here's how *The New York Times* covered the BlackBerry's role shortly after September 11th:

Figure 13: Motorola Talkabout.

4.6 Towards a Global Smartphone Market

“BIG WTC explosion. I'm going to street. I'm scared.”

That was Lynne Federman's frantic e-mail message to her husband a few seconds after the first hijacked plane crashed into the World Trade Center. Ms. Federman, a corporate lawyer, was in her office at J. P. Morgan Chase, three blocks from the trade center, punching the message into her BlackBerry pager.

“What??” her husband, Joseph Korb, wrote back on his BlackBerry from Newark, where he was on jury duty.

“Seems helicopter crashed into WTC,” Ms. Federman replied. “Going to street now. Very scary. End of world.”
Like many people in the aftermath of that chaotic Tuesday morning, Ms. Federman and Mr. Korb found that telephones and cellphones worked only sporadically. So they communicated with each other in terse text messages for several hours as Ms. Federman, covered in ash, fled on foot from Lower Manhattan.

“I had my cellphone in one hand, and it was useless, and my BlackBerry in the other, and it was my lifeline that day,” Ms. Federman recalled. (Romero, 2001)

In addition to the 2000 release of its BlackBerry 957 and concomitant marketing campaign, RIM also benefited from the growing tech bubble that was raising both stock prices and investor expectations. The interest generated by early versions of the BlackBerry pager, followed by the PDA, had made the brand itself almost ubiquitous among professionals and corporate executives as an iconic symbol of the so-called "new economy." RIM's stock valuation began a mercurial rise between April 1999 and February 2000, climbing from $9.25 to $175.75 USD. At the beginning of 2000 the valuation of the company was in the billions, making many of its founders and primary stockholders multi-millionaires. RIM, however, was not safe from collapse of the stock market tech bubble. Despite positive reviews for the 957, by mid-April 2000 RIM had lost almost $8 billion USD, or about 63% of its stock value (Morgenson, 2000).

Increasing competition and a lowered stock valuation pressured RIM to expand its product line and seek new ways to stimulate greater demand.[160] Consequently, the BlackBerry 5800 was released later in 2002 (figure 14). Although aesthetically no different than the 957, the device featured one significant improvement: it enabled voice telephony. This was a crucial development since the 5800 was, in effect, the first smartphone available for a global market. The ability to make voice calls was a

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[160] As discussed in the previous chapter, it was during this period that RIM began its patent battle with NTP. It is difficult to assess to what extent the multi-year legal battle would influence RIM's research and development priorities, but one could confidently assume that a more substantive and risky consumer-centric strategy would have been retarded by legal threats and patent conflicts. The year the patent suit was settled, 2006, was also the year the consumer-targeted BlackBerry Pearl was released.

significant advancement for the BlackBerry platform, even though it required the use of an awkward headphone and microphone cord extension.[161]

Awkwardness aside, technology reviewers gushed over both the device's expanded functionality and RIM's prescience in anticipating the needs of BlackBerry users (and the telecommunications industry generally) by providing a single technology linking asynchronous (email) and synchronous (voice) communication. As Pogue commented, "You can't go two minutes without marveling at how the BlackBerry has, yet again, anticipated and crisply executed your desires" (Pogue, 2002). The 5800 also made important advances by offering software that made the thumb-based composition of email messages easier: "It capitalizes sentences, puts apostrophes into your contractions and @'s into your e-mail addresses, and auto-corrects thumb typos," wrote reviewer David Pogue (2002).

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[161] As already noted above, the BlackBerry 5800 was built around the Java Micro Edition (J2ME) software architecture in order to expand the range of potential applications that could run on the device (Anonymous, 2002b; Suppa, 2002). The incorporation of J2ME into wireless data devices like the BlackBerry also was strongly supported by wireless carriers because this not only expanded the range of data-intensive applications, but also the expansion of wireless applications would drive up the overall usage, and thus revenue, derived from wireless data networks and services (Suppa, 2002).

Figure 14: BlackBerry 5200 with earpiece and microphone.

The 5800 took the BlackBerry brand beyond just being a device for email, integrating both voice (on GSM) and data transmission capabilities. With this integration the BlackBerry could appeal to both traditional voice users (primarily non-business consumers) as well as a growing base of consumers who regularly use emails and text messages. The integration of voice and wireless data entailed important technical advances like increased miniaturization of components, greater energy efficiency, and more sophisticated software applications. Arguably more significant is the fact that this integration also reflected the construction of a virtual global telecommunications network through which it was made possible. In so doing, RIM became the world's first "mobile virtual network operator" (MVNO). MVNO describes the process by which a company cobbles together its own telecommunication network by buying bandwidth from a variety of different providers.[162] Buying bandwidth in this fashion allowed RIM to route global data through its servers in Waterloo, enabling it to maintain the security of user information and its leadership position in push-based data transmission. However, when a voice call was made the device would connect to one of RIM's partner network operators. As an MVNO, RIM could operate, and to a certain extent, control, its own network across a patchwork of standards and telecommunication networks around the globe.[163]

The ability to create an MVNO directly involved accelerating global diffusion of wireless standards at the time RIM began designing the 5800. While RIM was still marketing its data-only BlackBerry devices, important innovations in the GSM standard began to enable data transmission. Known as 2.5G technologies, Global Packet Relay System (GPRS) was an add-on that GSM providers could deploy to enable the same data transmission possibilities as Mobitex and DataTAC.[164] From RIM's perspective, the

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[162] As a result, RIM effectively became a telecommunications operator. International telecommunications providers such as Virgin Mobile would adopt this model later.

[163] The project of creating a MVNO was set in motion as early as 1998 when RIM made major deals with RAM Mobile Data and Rogers to provide a "total package" solution comprising hardware, software, and network services. The resulting arrangement allowed RIM to develop the BlackBerry brand identity as a total solution. It was the early appeal to corporate clientele that suggested the saliency of this project for RIM's long-term corporate identity. As Lazaridis explains, "Selling the package ourselves was important because we believed in wireless corporate email. No one else really believed in it. Wireless corporate email required a lot more hand-holding and different marketing. We decided we were going to fund this ourselves, we were going to build our own sales force and support organization" (quoted in McQueen, 2010, p. 159). RIM continues to act as an MVNO in different capacities. Its BlackBerry Messenger service is available almost anywhere in the world, allowing BlackBerry users to communicate with each other regardless of where they are located. This also allows users to share media, transfer documents, and chat in real time. Voice services are primarily facilitated by local telecommunications providers partnered with RIM.

[164] Another upgrade to this lineage known as EDGE qualified as an early 3G standard because it met the minimum technical specifications outlined by the ITU but only at peak rates and is often described in reference to other 2.5G standards (Lindmark et al., 2004, p. 309).

reason for creating its own MVNO stemmed from the uneven deployment of 2.5G technologies that slowed the development of the smartphone. With RIM in control of the flow of data to and from its BlackBerrys, however, it could coordinate the smartphone functionality based on what networks were available and allow consistent services across different markets.

At the same time that the creation of an MVNO enabled RIM to create and manage a global network for its devices, it also afforded an opportunity to evolve functional capabilities. Specifically, because Mobitex and ARDIS were optimized for asynchronous wireless data transfer, MVNO RIM could build voice on top of its wireless capabilities. The design of the 5800 created a basic, albeit somewhat haphazard, integration of voice and data connectivity that was aesthetically similar to other existing PDAs including RIM's own 957. While it allowed for important technical (convergence of voice and data) and political-economic (the creation of an MVNO) advancements, it still was not the market-defining device RIM was looking for as it drew too heavily on the design of existing devices.

Released in 2003, the next BlackBerry iteration, the 7200 (figure 15), solidified the IMD aesthetic and function for the next four years (until the iPhone 3G began its major market push).[165] With its growing corporate popularity,[166] the 7200 became the

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[165] In 2003 RIM released the 6200, beginning a design approach that would make the BlackBerry form factor (referring to its outward design characteristics) an iconic smartphone. It was also the first wireless device to be available with both voice and data anywhere in the world as it featured tri-band GSM functionality. Though it was an important advancement over the 5800, it maintained many of the latter's software and components (and their limitations). It was replaced by the 7200.

[166] RIM's subscriber base doubled between 2003 and 2004 from 534,000 to 1,069,000 (RIM, 2004, p. 17).

defining image of the smartphone for both professional users and, increasingly, “regular” consumers, as it was now designed to reflect the specific media needs of both individuals and institutions. The 7200 pushed the functionality of the BlackBerry with the inclusion of Bluetooth (7250) and wireless local access network (WLAN) capabilities (7270) geared toward voice over IP (VOIP). These innovations emphasized more expansive and diverse data usage as a key feature. Wireless data now could be produced by a BlackBerry handset in multiple standards to fit with the context of its use. As such, it allowed the networked integration of the device not only in the corporate space but also within a personal access network (PAN). Furthermore, the 7200 device also demonstrated the aesthetic growth of the BlackBerry from a boxy pager (850/950) to a QWERTY/email-enabled PDA encased in coarse plastic casing (957), to a smartphone (7200) featuring a smooth, rounded shape, suitable to be held in the palm of the hand. The 7200 also had a consumer friendly glossy plastic enclosure, larger buttons angled to maximize thumb-typing and, for the first time, a high-resolution colour screen. The broadening uses and aesthetic design of the BlackBerry reflected in the 7200 were a part of RIM’s strategic effort to expand its market to the mass consumer.

Figure 15: BlackBerry 7200, nicknamed “The BlueBerry.”

Late in the following year (2004), RIM released the 7100 (figure 16), a device specifically designed to be RIM’s first “prosumer” device. From its marketing perspective, the prosumer segment comprises people purchasing the device for both professional and social uses (RIM, 2005). The central design strategy of the 7100 involved a renewed emphasis on the *individual* by making the device slimmer to resemble the “candy bar” shape of most mobile phones.[167] To accomplish this redesign, RIM had to compress the keyboard by making each button span two letters of the

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[167] “The new 7100 opens them [RIM] up to an audience of individuals instead of just companies” (Bulik, 2004).

QWERTY keyboard.[168] Additionally, this hybrid design brought with it an enhanced software capability called “Suretype”: an algorithm RIM developed that learns to anticipate words with greater accuracy, making word suggestions when only a few letters have been typed. Building upon earlier software innovations, the algorithm also fills in important punctuation and spacing when necessary so as to speed up the composition of emails using this compressed keypad.[169] The BlackBerry also became a platform for consuming and producing an expanding range of multimedia content as the 7100 offered several upgrades that reflected growing uses (for example the ability to see JPEG photos and other media files attached to emails).

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[168] For example, on the 7100 keypad the number 1 would correlate to QW whereas on a standard phone keypad the number 1 is not assigned letters. This compressed QWERTY keyboard is still used in some newer BlackBerry models like the Style flip-phone.

[169] These added software features are now standard on all smartphones, with different variations, but here, in their infancy, they mark an important evolutionary pivot point for the role of software in enhancing the mobile typing experience.

Figure 16: BlackBerry 7100.

With this new generation of BlackBerrys, RIM provided a device that could expand its highly profitable wireless data revenues on a per-user basis, increasing the profitability of each handset to the telecommunication provider as well. For example, an article in *Adweek* describes the specific profitability of the BlackBerry for the company Cingular Wireless, which could exact fees for both voice and data usage from BlackBerry subscribers. *Adweek* wrote:

> Cingular Wireless is voicing its support for data with its first major consumer campaign for its BlackBerry e-mail service. The out-of-home effort, breaking this month in the New York market, targets “prosumers” who are using their own money to purchase the devices and Cingular's Xpress Mail. “More traditionally with mobi-text [sic], business was paying for it,” said Glen Moyes, client director

of marketing for the New York City region. “But now there's a shift towards people paying for it themselves.” (Wasserman, 2004)

Around the time of the launch of the 7100, “the prosumer” was becoming a discernible market segment. RIM also began to make an aggressive push into international markets. Though still growing, the primarily enterprise-level demand for BlackBerrys in North America was reaching a level of maturity that suggested slower growth. The prosumer push thus reflected, in part, a new *global* search for a broader market, not only for new devices, but also for wireless services in light of the spectrum auctions discussed at the outset of this chapter.

RIM had developed enough experience dealing with telecommunication companies to capitalize on the fact that 2G and 2.5G mobile networks now covered most lucrative mobile markets in many parts of the world. The deployment of 2.5G international networks demanded more devices suited to the production and consumption of wireless data. Moreover, there was already a rapid competition to rollout 3G networks, which, in 2000, were subject of costly spectrum auctions in Europe (Ure, 2002). This meant telecom corporations, particularly in Europe, were looking to monetize their investments as quickly as possible. The astronomical price ($80 billion USD) paid by European telecommunications providers for the auctioned 3G spectrum is itself an indication of the inflated expectations associated with the development of the mobile Internet.[170] 3G constituted the coming of a data-intensive, Internet protocol (IP)-based

[170] As Ure (2002) explains, the main concern for European telecommunications providers, rendered debt-ridden by the 3G auctions, was ultimately “consumer indifference” to wireless data, particularly in light of unimpressive Internet navigation using the wireless access protocol (WAP) applied by existing mobile

mobile network and, although RIM's first official 3G BlackBerry would not be available for another four years, the BlackBerry represented a relatively popular device capable of monetizing wireless data.[171] By 2006, 25% of RIM's subscribers were outside North America reflecting the BlackBerry's position as an international brand offering devices operating on all major international and domestic networks (RIM, 2006, p. 6).[172] BlackBerry users that year totaled five million worldwide. This figure constitutes a small part of the overall mobile market, but a doubling RIM's user base from the previous year.

From 1999-2005, RIM developed the BlackBerry into an international brand and, in so doing, a global ambassador for a new technological condition. With the integration of wireless voice and data capabilities, the global spread of the BlackBerry helped create a new market for telecommunications devices and services. As a technical expression of the myth of UC, the BlackBerry's early history maps onto political economic changes associated with the rise of neoliberal policy-making and market competition. In this sense, the BlackBerry's history offers a way of relating the variety of interests that made its early success possible. This involved the auctioning of spectrum and the need to provide telecommunications companies with means to redress investments related to it;

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phones (129). By 2004 the growing popularity of the BlackBerry for enterprise and increasingly consumer uses demonstrated a clear demand for premium wireless data services and devices.

[171] RIM launched the popular 8700, which operated on the proto-3G network EDGE and offered new features allowing for the broader use of wireless data including web-browsing and multimedia handling. It also featured a newly designed Intel chipset developed to exploit mobile broadband usage. The 8700 was launched in Europe in 2006.

[172] By 2010 RIM would have a presence in 175 countries across 550 carriers and distributors (RIM, 2010). Indeed, by this time international expansion constituted the bulk of RIM's profit base as it faced growing competition from both Apple and Android-based phones in North America, eroding its consumer and enterprise base (Weinberg, 2011).

investment in R&D, wireless infrastructure, and component manufacturing; and branding and marketing initiatives targeted at elite or professional users.

This chapter has traced the development of the BlackBerry as a specific "solution" to the problems associated with the commercialization of wireless data networks and devices outlined in the previous chapter. RIM's success in this endeavour stemmed from a number of contingent factors including the concentration of skilled and experienced personnel, the development of strategic partnerships, the cultivation of consumer demand, and the resulting evolution of BlackBerry devices and services. Together, these factors provided the basis for the development of a global market for wireless data networks and devices.

In the next chapter, I turn to on the policy environment that nurtured RIM's development but one that also reflects a broader mythic framework implicating the condition of UC represented by the BlackBerry.

Chapter 5 – From "New Economy" to "Creative Economy": RIM in Policy Context

5 Introduction

In the last chapter, I focused primarily on commercial and technical forces shaping the development of the BlackBerry. As discussed, by 1999 ubiquitous connectivity (UC) was embraced by RIM and became an essential concept shaping the technical development of its devices and services, as well as its brand identity. In the last chapter, I historicized the development of the BlackBerry within the confluence of political economic interests seeking new devices and services consonant with a professional (elite) workforce, particularly in light of developments around spectrum auctions, wireless infrastructure, components, and the rising importance of email and the Internet for commercial organizations. Yet the myth of UC that underpins these developments, and to which RIM's success (and failure) is intimately tied, is itself born out of the "new economy" rhetoric that came to define public policy initiatives in Canada (as well as in the United States)—rhetoric specifically dealing with labour and technology. Beginning in the 1980s, but accelerating during the 1990s, the new economy mantra reflected and extended theoretical and policy frameworks in which an economy emphasizing knowledge, communication, and services became increasingly central. Thus the seeds for the global expansion of the BlackBerry brand (and the myth of UC) as the "ambassador" not only of a new device category but of a purportedly new condition were planted by RIM but nurtured within the soil of public policies (both domestically and internationally) that emphasized the communicative and creative capacities of workers and consumers (and the purported efficiencies and cost savings associated with their flexibility and mobility). Given this emphasis on post-industrial intangibles, such as information, knowledge, and creativity, the "value proposition" (to use an oft-deployed marketing term) forwarded by RIM involved its role in providing tangible tools for intangible products. RIM thus provided both public and private interests with the means to fully network, connect, and manage their workers regardless of time or location.

Unsurprisingly, RIM's success became a focal point of Canada's technology sector and the country's technology-related economic policies. Having described RIM's growth in the previous chapter in relation to the commercialization of wireless devices and services, this chapter demonstrates how the company itself benefited from a specific policy "environment." To be clear: this is not to make the shallow assertion that RIM's success was caused directly by particular post-industrial policies but, rather, that its history (and thus the development of UC itself) is fundamentally intertwined with them.[173]

In this short chapter, I will return to the role of post-industrial myths in coordinating both public and private innovation, and illustrate how RIM is but one example of this coordinated vision. I intend to examine how the rhetoric of the new economy in Canada had two important implications within the policy contexts that

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[173] This section also relates to an earlier discussion regarding the failure of the Palm Pilot and the success of the BlackBerry in becoming an ambassador of the era of ubiquitous connectivity. In the US, the politics of funding for nascent technology companies associated with the rise of venture capital was incredibly volatile. Such volatility has lead to the demise or stagnation of many potentially lucrative enterprises, simply on the bargains, or trade-offs, between investors (banks, other corporations, venture capitalists) and finance starved entrepreneurs (Palm being one important example). RIM, however, had the distinct advantage of being within a policy environment that was trying to emulate the incredible successes and wealth generated by Silicon Valley companies. As a Canadian company, with a prospectively lucrative market niche, in the era of global competition for leadership/supremacy in technology markets guided by the Schumpeterian belief in "creative destruction," RIM became a symbol of Canada's technological future—particularly after the long and painful demise of Nortel.

shaped RIM's early success in commercializing wireless data and devices. The first was in generating the policy frameworks geared toward stimulating Canada's information and communication technology sector through strategies focusing on innovation. The second morphed the language of the new economy into policy frameworks aimed at harnessing intellective capacities (communication, co-operation, cognition) for economic growth. As I will address in chapter 6, this second context has facilitated the restructuring of public and (especially) private organizations in ways that have concentrated their activities towards increasing the management and efficiency of human capital using ICTs. It was when these policy contexts converged that the BlackBerry emerged as more than a successful product and brand. It also became an iconic tool of post-industrial myth-making.

Above all, this chapter is meant to illustrate, through its use of a specific example, that technological change, growth strategies, and policy environments are intimately connected as together they constitute expressions of deeper social-economic structures and conditions. As Melody explains, both technological innovation and related policy developments "have been shaped by market forces, the priorities of financial capital, the results of court decisions, and a variety of old and new social, cultural and political institutions. And all these developments have been informed, for good or ill, by the scholarly and other knowledge of the day" (Melody, 2007, p. 70).). In other words, what appears in policy work is an expression of a variety of economic, political and cultural forces. Myth has played an important historical role in shaping Canadian policy and cultural identity (Babe, 1990, pp. 3), but myth has been particularly important in the application of Schumpeterian theories of innovation in liberalizing technology markets

(Babe, 1990, p. 19). With this in mind, I begin with an examination of new economy rhetoric in Canada as it has been employed by various actors, agencies, and organizations to create policies addressing rapid technological change, particularly around ICTs. I then outline how this rhetoric has framed both federal and provincial policies incorporating post-industrial strategies focusing on the intellective capacity of workers, the generation and commercialization of new knowledge (innovation), and the re-shaping of public and private institutions (e.g. public-private partnerships (PPP), patents as measure of innovation, tax credits/incentives for investment, private and public venture capital). In sum, this chapter links the specific policy context that supported RIM's development with a more general policy climate (e.g., the *new economy*) that encouraged investment in new technologies (e.g., IMDs) in order to harness and exploit the intellective capacities of workers.

5.1 Building Canada's "New Economy"

RIM's founding in 1984 took place during a period of significant deregulation within the Canadian ICT sector. In particular, the 1983 restructuring of Bell Communications Enterprises (BCE) heralded a new era in which Canada would foreground the use of market forces to regulate the development of ICTs in the country (Babe, 1990). Similarly, the breakup of AT&T in 1984 by the US Federal Trade Commission (FTC) and US Department of Justice ignited a new period in which market competition would play a greater role in the development of telecommunications services in North America (Kenedy, 1989). Combined with the move towards the North American Free Trade Agreement (NAFTA), Canada's technology sector would be induced to become more efficient and competitive or face a takeover by foreign, especially American, capital.

In the decade (1984-1994) leading up to both NAFTA and the Internet boom,[174] rhetoric about the *new economy* was already beginning to influence policymakers across North America (Atkinson, 2000; Canadian Labour Congress, 1993). In the U.S., among the most enthusiastic, and arguably powerful, champions of the new economy was Alan Greenspan (Ball & Tchaidze, 2002; Editors, 2001; Foust, 1997; Ip & Schlesinger, 2001; Lundvall, 2004; Palley, 2005) who served as chairman of the U.S. Federal Reserve from 1987-2006. A speech given to the National Governors' Association in 2000 entitled "Structural Change in the New Economy" is indicative of Greenspan's conceptualization of this economic order. In his speech Greenspan argued that it was "the proliferation of information technology through the economy that makes the current period appear so different from the preceding decades…One result of the more-rapid pace of IT innovation has been a visible acceleration of the process that noted economist Joseph Schumpeter many years ago term 'creative destruction'" (quoted in Anonymous, 2001a). As a proponent of the new economy, and particularly the role of ICTs in driving the

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[174] As another notable moment of synchronicity, in 1994 a July 25th edition of *Time Magazine* featured the cover story "The Strange New World of the Internet: Battles on the frontiers of cyberspace." http://www.time.com/time/covers/0,16641,19940725,00.html. A month later Newt Gingrich's Freedom and Progress Foundation published the first iteration of the highly influential piece "Cyberspace and the American Dream: A Magna Carta for the Knowledge Age" written by George Gilder, Alvin Toffler, Esther Dyson, and George Keyworth. The paper would go on to be published in the academic journal *The Information Society* in 1996 (See Webster et al., 2004). See http://www.pff.org/issues-pubs/futureinsights/fi1.2magnacarta.html. In October 1994, Mosaic Communications Corporation released the Mosaic Netscape 0.9 web browser, or what would later be called Netscape Navigator, effectively opening up web browsing to the mass public and private sector interests.

productivity and stock market gains of the 1990s,[175] Greenspan's position as Chairman of the U.S. Federal Reserve legitimized costly investments in new technologies and their purported heightening of the intellective capacities of workers.[176] The economic boom experienced in the U.S. during Greenspan's tenure as head of the Federal Reserve, and his championing of the importance of ICTs to the new economy, furthered his influence among other national and supra-national policy makers (OECD, 2001).[177]

In Canada, similar rhetoric helped foreground the role of entrepreneurialism, market competition, and R&D investment (both public and private) for stimulating indigenous Canadian innovations, as well as the drive to modernize industrial manufacturing towards *information* or *knowledge*-centered production activities (Canadian Labour Congress, 1993; Menzies, 1996, 1997). Market mechanisms came to

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[175] In early 1994 the Dow Jones Industrial Average (DJIA) sat at a mere 3,600. By January of 2000, at the peak of the tech bubble, the DJIA stood at 11,700 (Steinbock, 2003, p. 114). According to economist Dan Steinbock, the "irrational exuberance" (a term used by Alan Greenspan himself in 1996) represented by this surge in stock valuation was driven by the perceived potential economic value of the Internet and mobile technologies. Between 1994 and 1999 the Internet expanded from a $34 billion USD industry to one worth $257 billion USD (p. 114). Valuation associated with mobile technologies was stimulated by the perceived future value of 3G spectrum licenses and the global adoption of GSM which inflated the stock valuation of many European vendors (particularly Nokia and Ericsson). At its peak in 2001 (before the bubble burst), Nokia had a market capitalization of $260 billion USD (p. 116), dropping to $74 billion USD in 2003 (p. 116) (at the end of February 2013 it sits at $14 billion USD). Other companies associated with mobile technologies experienced similar extreme fluctuations during this period (p. 119).

[176] The link between ICTs and increased economic productivity has itself been hotly debated (see OECD, 2001; Steinbock, 2003), partly because of the difficulty of measuring or quantifying productivity gains for "intangible" products like knowledge, information, and creativity. For a detailed Marxist critique see Garnham, 1998.

[177] Among the most central factors identified by the OECD (2001) for the rapid GDP growth in the U.S. during the 1990s were: 1) new capital investment in ICTs, 2) rising quality of labour related to rising educational attainment and skill level, 3) "greater efficiency in how capital and labour are combined," what they refer to as "multi-factor productivity" (MFP) (pp. 6-7). The report also suggests that,

> The growth of MFP also seems linked to the efficiency-enhancing benefits from the use of ICT, when combined with organizational change and better skills. Policies that engage ICT, human capital, innovation and entrepreneurship in the growth process, alongside policies to mobilize labour and increase investment, are likely to bear the most fruit over the longer term. (p. 8)

play a greater role both in guiding the R&D of new technologies as well as their adoption by consumers (primarily through the increase in marketing and advertising around new devices and services). In this regard, the passing of NAFTA removed export barriers for Canadian products, and telecommunications acts in both Canada (1993) and the U.S. (1996) legislated more liberalized export/import markets, ICT production activities, and economic conditions for service sector developments. In particular, the U.S. Telecommunications Act of 1996 enabled the creation of a relatively unregulated market (at least in terms of government regulation) for "information services" that did not carry the same public good and universal access mandates of previous pieces of legislation (Hendricks, 1999; Common Cause, 2005). The Act's inclusion of "information services" as a new category—re-regulated to maximize the influence market dynamics—was particularly important for the commercial development of personalized wireless data services and devices (Zysman, 1995). Although the net neutrality and common carriage debates infused some considerations of public good into the regulation of wire-line Internet access, the wireless data sector was to be shaped almost exclusively by market forces and, thus, corporate interests.

Two companies emerged to become emblematic of the "new economy" in Canada. The first was Nortel, a company born from the privatization of Bell Canada's hardware and component division. [178] Nortel produced innovations that built the largely unseen infrastructure of the ubiquitous network society (focusing initially on optical

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[178] At its height, Nortel had a market valuation of $350 billion CDN (Fogarty et al., 2007, p. 167). Its resulting decline culminated in the liquidation of its assets, including crucial 3G/4G patents, beginning in 2009.

cables[179] and later developing important patents for 3G, 4G, and WiMax wireless standards).[180] Ultimately Nortel fell victim to the dot com crash of 2001, in large part due to massive debts incurred through a misplaced belief in continued demand for network infrastructure (Hunter, 2002). The second commercial enterprise was Research In Motion. As addressed in previous chapters, RIM went on to create a new consumer device market—the smartphone—and an iconic, household brand in the BlackBerry. The BlackBerry also played a central role in promoting and reproducing myths related to the power of networks, connectivity, and the Internet within the new economy. Thus the "always on" capabilities enabled by an experienced using the Blackberry served as a tangible expression of the vision articulated by Alan Greenspan, Bill Clinton, and others.[181]

5.2 Ontario in the new economy[182]

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[179] Significantly, Nortel actively promoted its own all-encompassing narratives about societal transcendence through ICTs. Beginning in 1976, Nortel underwent a variety of transformations from digital technologies, to optical cable, then wireless broadband. Each transformation carried its own mythic narrative. For example, the "fiber world" campaign launched in the 1990s helped push its product line of optical fiber cables (Cole, 2000).

[180] These patents were later acquired in 2011 by a consortium of wireless companies including Apple, Microsoft, *and* RIM for $4.5 billion USD (Arthur, 2011).

[181] As I described in the previous chapter, before RIM's BlackBerry made the smartphone a household name, the possibility of creating a mobile Internet device, while highly anticipated, was still fraught by several regulatory and technical obstacles. As such, there was little indication of the profitability warranting the substantial investments in research and infrastructure required. The BlackBerry was the first real success story indicating the potential profitability of wireless data services and devices.

[182] This section is not meant as an exhaustive survey, but a representative sample. Invoking the "new economy," and related conceptualizations, is still central to Ontario policy-making. The 2011-2015 Ontario Liberal Party platform (the party that has been in power since 2003-2013) uses the term extensively. For example, a typical usage goes as follows: "…the Liberal Plan is making our province a leader in the new economy" (Ontario Liberal Party, 2011, p. 14).

The Ontario government has played an important role in developing funding mechanisms for technological innovation. Ontario's own approach to the "new economy" adopted a broader techno-nationalist narrative that made sense of the changing composition of the provincial economy (specifically, the erosion of the manufacturing sector).[183] The Ontario Technology Fund (OTF) was set up to help fund emerging technology companies consonant with the policy shifts outlined above:

> The Ontario Technology Fund was established in 1986 with the goal of helping build a more innovative economy within the province by harnessing the ideas emerging from R&D groups in universities and throughout the private sector. By 1992, the original fund was fully committed. In the six years that the Technology Fund has been in existence, it has become increasingly clear that we are in the midst of profound global economic changes. (Government of Ontario, 1993)

In addition, the Ontario government widely promoted public-private partnerships (PPP) policies to leverage its substantive university assets into quantifiable economic gains by commercializing research. The University Research Incentive Fund, with an initial funding base of $6.7 million CDN, was established in 1991 "to encourage

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[183] Once Canada's industrial and manufacturing leader, Ontario has experienced systemic erosion of these industries. For example, between 1989 and 1995 manufacturing employment dropped by 260,000, a loss attributable to the adoption of NAFTA (Wolf & Gertler, 2001, p. 581). During this period, employment in manufacturing declined by 30%, roughly the same percentage decline as the number of employers/establishments in manufacturing (p. 583). Though manufacturing and other heavy industries are still a significant employer in the Ontario economy, labour statistics evidence protracted, though fluctuating, job losses, a trend that has accelerated in the last decade. Between 2004 and 2008 Ontario lost 198,600 manufacturing jobs, the bulk of manufacturing jobs lost in Canada (322,000) during that period (Bernard, 2009, p. 9). Over the same period, GDP in goods producing industries declined from $138 million CDN in 2005 to $129 million CDN in 2008. Thus while employment in goods producing sectors during this period declined by 18.1% (Bernard, 2009, p. 9), GDP in this sector declined by only 4.5% (Statistics Canada and Ontario Ministry of Finance, 2009). As of 2011, manufacturing accounts for 12.9% of Ontario GDP (Ontario Ministry of Finance, 2012).

universities and the private sector to enter into cooperative research ventures" (Government of Ontario, 1993).

In the context of Ontario, reports related to these programs deployed a variety of new economy tropes. A 1993 task force assembled by the Ontario Premier's council to review the OTF cast its assessment as a futuristic report to the Ontario premier of 2002. In this case, it projected the basic components of the new economy into a future that re-envisioned Ontario as a utopia of post-industrial innovation. By projecting its evaluation into the future, the review strongly embraced both the rhetoric and vision of the OTF. The report emphasized the importance of "idea-based innovation" stemming from R&D, arguing that the source of economic growth in the new economy comes primarily from "the application of ideas, rather than the physical transformation of objects" (Task Force, 1993). In the introductory remarks, the Task Force authors wrote that,

> wealth creation through innovation requires the development of a new framework of understanding about ideas and their relation to economic growth. Incorporating the role of ideas (technological innovations) into the neoclassical theory of economic growth results in major new insights, and forces a reconsideration of economic policy and regulations. We learn that a sustained investment in ideas to produce tradable goods and services can permanently raise a country's economic growth rate. (Task Force, 1993, pp. 1-2)

Though not particularly original in its analysis and recommendations, the timing of the report, in light of more profound changes in the Ontario economy gave these recommendations the "aura" of truth.

In a similar vein, a 1995 report to the Ontario Premier's Council entitled "Performance Measurements in the New Economy" describes how the seeming necessity of policies related to technological innovation were a direct response to broad transformations in the global economy that emphasized the central importance of "intangibles"—knowledge, information, creativity—as primary generators of wealth (McLean, 1995). In this report, a number of post-industrial prophets and theorists are cited, including Paul Hawken, Stanley Davis, Chris Freeman, and Peter Drucker. While perhaps not as well known as other post-industrial theorists like Daniel Bell, it was Drucker who coined the term *knowledge worker* and who wrote influential management texts like *The Concept of the Corporation* and *Innovation and Entrepreneurship*. Drucker also frequently acted as a consultant for federal and provincial agencies in Canada (Drucker, 2010). In a section from the "Performance Measurements in the New Economy" report entitled "Tangible versus intangible assets," Drucker is quoted approvingly: "[t]he industries that have moved into the center of the economy in the last 40 years have as their business the production and distribution of knowledge and information, rather than the production and distribution of things" (quoted in McLean, 1995).

Joining Drucker as a recurring theorist cited in Ontario's new economy policy framework is James Quinn, author of influential management text *The Intelligent Enterprise*, which figures prominently in the Ontario report. A typical quotation reads:

> [w]ith rare exceptions, the economic and producing power of a modern corporation lies more in its intellectual and service capabilities than in its hard assets—land, plant, and equipment. Similarly, the value of most products and

> services depends primarily on the development of knowledge-based intangibles, like technological know-how, product design, marketing presentation, understanding of customers, personal creativity, and innovation. (McLean, 1995)

What these examples illustrate is that the rhetoric of the "new economy" offered a post-industrial architecture for Ontario's technology policies—policies that, as I will argue in the next section, underpinned the funding of RIM's formative years.

5.3 Funding RIM[184]

Taken together, the national and provincial policy climate, and the resulting funding approach, served RIM well. The company's initial founding involved a $15,000 CDN loan from the Government of Ontario New Ventures loan program in 1984 and it was tax credits that provided RIM with the financial ability to survive its infancy as it sought out contracts to keep itself afloat. In 1994, the OTF provided $4.7 million CDN which, as Sweeny notes, was a huge sum "greater than RIM's annual revenue at the time" (2009, p. 130). Fulfilling its new role in creating public-private partnerships, the University of Waterloo helped RIM secure $100,000 CDN in 1993–1994 from the Industrial Research Assistance Program.

As a result of new initiatives that facilitated foreign investment, later in 1994 RIM secured a $300,000 CDN investment from Ericsson; a Swedish company that, as a result of its partnership with Rogers, had a growing presence in the Canadian telecommunications sector (Rogers, 2008). Ericsson's investment was predicated on an

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[184] Except where noted, all data about government funding are drawn from McQueen, 2010, pp. 41, 76-77.

initial grant from the Ontario Development Corporation (ODC) (Sweeny, 2009, p. 128). A crucial component of this early investment was that neither Rogers nor Ericsson would gain any ownership rights to RIM or its products, thus allowing it to remain autonomous. In 1998, RIM secured a $5.7 million CDN loan from Industry Canada's "Technology Partnerships Canada" initiative. This provided crucial funding that allowed RIM to fulfill Bellsouth's $70 million USD order of the first BlackBerry 850 pager. Similarly, government backing of this sort helped bring Intel a partnership with RIM to supply custom chips. As described in chapter 4, this was important because Intel had to invest in infrastructure to produce a specialized chipset that would accommodate the needs of the BlackBerry, but without some guarantee on funding it could not fully justify these investments. Intel is one of the semiconductor industry's largest companies and by committing to build this new chipset, Intel and BellSouth/Cingular indicated that they intended to make a significant effort to commercialize wireless data.

In 2000, RIM received $33.9 million CDN from Industry Canada, and another $12 million CDN in 2002 from the federal Scientific Research and Experimental Development (SR&ED) tax credit program. In this case, RIM's competitive advantage, in part, rested on the financial support it received from public institutions, both provincial and federal.[185]

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[185] Beginning in the mid-1980s the Canadian strategy involved both national and provincial level initiatives and comprised programs such as venture capital allocation, tax credits, government grants or loans, as well as loosening restrictions on foreign investment and trade (see Niosi et al., 2000 for an overview and history of Canada's national strategy for innovation or NSI). In particular, the federal income tax system was used as a mechanism to foster private investment in R&D. Using "tax incentives" for scientific research and experimental development (SR & ED), the federal government of Canada implemented a combination of income tax deductions and investment tax credits to broadly promote R&D in the private sector (Department of Finance Canada, 1997). These tax incentives were designed to compensate for the extant "market failure" in R&D that had left Canada at a disadvantage with respect to the rigors of the 'new

5.4 University of Waterloo and Canada's Technology Triangle

Canada's new economy policy framework not only benefited RIM in its formative years, but it was also important for the Waterloo region as an economic cluster. Indeed, RIM and the Waterloo region became the success stories used to promote the "new economy" Canada and the effectiveness of Ontario's new economy strategy focusing on R&D and the commercialization of knowledge. For many policy-makers, the success of the Waterloo region legitimated the symbiotic success of public-private partnerships (PPP),[186] whether directly through joint-ventures and programs or through the creation of

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economy' whose vitality relied on R&D as an essential lynchpin. This system of tax incentives was put into place during the period 1983–1985, and was mirrored or augmented by provincial tax policies, particularly in Ontario.

[186] The valorization of R&D in the private sector was mirrored in the public sector. Beginning in the mid-1980s, the rhetoric of the new economy was increasingly used in policy directed at the public sector. In the midst of major declines in manufacturing capacity and employment, Ontario policy-makers increasingly focused on investments in post-secondary education as way to offset these losses (see Wolfe & Gertler, 2001). According to the dictums of the new economy, public institutions—particularly universities—were to play an integrated and complimentary role in stimulating the commercialization of new knowledge. Fears of Canada's inability to adapt to the rigors of the new economy also ushered in a restructuring of the role of universities and other publicly funded research institutions in the creation of private–public partnerships (PPP). The fetishistic use of the term *innovation* entailed a closer integration of University research into the commercialization of new knowledge through ICTs. As an ancient institution supposedly dedicated to the dispassionate pursuit of knowledge as a good in-and-of itself, the definition of innovation deployed by policy-makers positioned the university as a knowledge factory (David, 1997; Aronowitz, 2000; Bramwell & Wolfe, 2008). Beginning in the 1980s under Prime Minister Mulroney (1984-1993), but accelerating during the Chretien years (1993-2003), the federal government began to craft policies focused on "integrating market principles into higher education." Public funding was a means of stimulating the production of exploitable knowledge, only to transfer the economic benefits to the private sector. Consequently, universities in Canada became a focus of "innovation policies…aimed at fostering the use of the best (science and technology) to produce new and competitive 'first-to-market' products and new

a proximate pool of skilled IT professionals and prospective entrepreneurs. Central to this narrative of success was the University of Waterloo as a model for the role universities in Canada could (and should) play in creating and commercializing new knowledge.

Thus, in addition to grants, tax credits, and loans acquired through state funding, the university was another important public institution at the core of RIM's relative success and autonomy. One of Waterloo's differences in relation to other Canadian universities was its policy of allowing researchers to maintain control over the intellectual property, including the patents, created on campus. This fostered a university culture that melded science and technology research with entrepreneurialism. Founded in 1957 under the guidance of local businessmen Ira Needles and Gerry Hagey,[187] the university was geared towards funneling academic research directly into the private sector, thereby preceding the recommendations that would make such motivations a federal and provincial policy goal. Dubbed the *Waterloo Plan,*[188] they included two important policies for the new university: 1) a co-op placement component for university programs that would allow students to rotate between academia and the private sector; and 2) as stated above, researchers, rather than the university, would own the patents arising from

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production processes, and the innovative organizational approaches and management practices that support these activities" (Doern & Stoney, 2009, p. 9).

[187] Gerald Hagey was an advertising and public relations manager at B.F. Goodrich Canada, a tire and rubber manufacturer, before becoming the first chancellor of the University of Waterloo. Ira Needles was the president of B.F. Goodrich Canada before becoming the second chancellor of the University.

[188] For a history of the University of Waterloo, see Dmitrienko, 1999.

their research. Nelles et al. (2005), attribute the University's "spin off success" to this second policy.

The University of Waterloo, by the 1990s, constituted a publicly sponsored engine for commercializing academic research (particularly research related to science, technology, engineering, and math—or STEM), albeit by turning the researchers themselves into entrepreneurs by foregrounding their ownership of knowledge (and its exploitation). By 2007, at least 47 firms had been identified as offshoots of research originally generated at the University of Waterloo (Bathelt et al., 2010, p. 524). More generally, the University has contributed to local economic development "through its ability to generate and attract the talent that underpins academic and applied excellence in science, math and engineering, support for local firm-based R&D, and its explicit institutional support for entrepreneurial activity at the local level" (Bramwell & Wolf, 2008, p. 1176). A 2001 study by PriceWaterhouseCoopers' suggested that 22% (or 250) of all "spin-off companies" in Canada had emerged from the Waterloo region (Bramwell & Wolfe, 2008).

Although RIM itself was not a direct offshoot of university research, as explained in the previous chapter, they benefited from the university and its pro-business orientation, as did many other interests in the surrounding area. Indeed, this is the local culture that spawned the institutional and intellectual foundations of RIM itself and continues to supply it with skilled labour as well as a regional economy of bourgeoning entrepreneurs (Bathelt et al., 2010, p. 530). This fact has been regularly mentioned by RIM's executives and in local and regional business news coverage (Smith, 2004). RIM founder Mike Lazaridis has donated upwards of $130 million CDN to the University of

Waterloo, including $100 million CDN to establish the Perimeter Institute for Theoretical Physics (Smith, 2004). On the economic importance of Waterloo and other universities, according to Mike Lazaridis,

> The number one reason to fund basic research…is to attract the very best researchers from around the world. Once here, they can prepare Canada's next generations of graduates, masters, PhD's and post-doctorates, including the finest foreign students. All else flows from this…If you really want to understand commercialization [of knowledge], all you have to do is attend convocation of your local university. (Lazaridis, 2004, p. 8)

The University of Waterloo, however, is only one, albeit very important, institution within the regional ICT cluster branded as *Canada's Technology Triangle* (CTT).[189] Established in 1987 through a consortium of regional governments and corporate stakeholders, CTT emerged as a regional strategy to enhance the competitiveness of the Waterloo/Kitchener/Guelph region in the new economy.[190] Its mandate was to draw international investment into the region, it also served as a high-tech lobby group seeking investments or low-cost loans for the region from the provincial and federal governments (Ziedenberg, 1995). The CTT has additionally served to

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[189] For details see http://www.techtriangle.ca

[190] Journalist Jason Ziedenberg describes the organization's founding as follows:

> The Triangle was conceived at a trade show in the U.S. in 1987, when the industrial commissioners of the four towns realized that high - tech multinationals didn't care to know Kitchener from Cambridge. As they schemed about how the region could pool its resources to attract high - tech companies to make up for the devastating loss of auto - industry jobs, someone pointed out that highways eight and 24 tie the towns into a triangle, and a PR pitch was born. (1995, p. 34)

promote the narrative of economic growth through high-technology in the national and international media—a narrative that served to mask the "creative destruction" that has taken place in a once bustling manufacturing hub. For example, the region lost a third (7,000) of its unionized jobs between 1988 and 1994 (Ziedenberg, 1995).[191] The institutionalization of CTT combined with its branding and marketing initiatives mirrored closely the overall federal and national narratives surrounding technology, innovation, and public-private partnerships. In the hopes of replicating the successes of other regional clusters, the CTT furthered the consolidation of private and public resources in the region. Specifically, the CTT as an organization expresses the post-industrial logic of the new economy emphasizing the concentration of knowledge/information/creative workers in the hopes of producing a regional *synergy* to attract national and foreign capital investment.[192]

5.5 Ontario in a Creative Age

The spectacular collapse of the Internet economy in 2001 exposed the limitations of "knowledge" and "information" as policy keywords, opening up opportunities for new, more seductive, frameworks within which to cast Ontario's economy. Richard Florida provided one such framework, and it is worth referencing as a means of returning to the myth of UC and the BlackBerry. Florida, whose concept of the creative class is

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[191] While the high-tech sector created wealth for some in the CTT region, the number of unemployed was almost 40,000 in 1994, "Jobs for unskilled persons are vanishing as the economy progressively shifts to high - value - added, high - skilled opportunities" (Smith, 1993).

[192] According to its promotional materials, the CTT boasts a GDP of $20 billion CDN (2011), 244 foreign owned companies, and $800 million CDN in private R&D expenditures (2009). See http://www.techtriangle.ca/en/recoursestools/QuickFacts.asp

emblematic of the types of post-industrial myths that have been at the heart of Canadian technology policy for decades, is one of the most widely cited contemporary theorists of the new economy.[193] His influence on the language, scope, and goals of public policy has been far reaching, though with mixed results (Peck, 2005; Kraftke, 2010).

Florida's influence in Canada arguably peaked in 2009 when he was commissioned to produce a report for the Ontario Government related to his thesis regarding the creative class. As noted in chapter 2, the concept of the creative class highlights the intersection of knowledge/information and technology as a primary structuring force in social change and economic growth. After being, in effect, given his own think tank at the University of Toronto in 2007—the Martin Prosperity Institute—Florida was commissioned by Ontario Premier Dalton McGuinty to "undertake a study of the changing composition of Ontario's economy and workforce," to "examine historical changes and projected future trends affecting Ontario," and then to "provide recommendations to the Province on how to ensure Ontario's economy and people remain globally competitive and prosperous" (Florida, 2009, p. iv). The resulting report, entitled *Ontario in the Creative Age*, is the most recent example of Ontario's search for a new model for economic growth centering on the keyword "creativity" championed by Florida. Consider the following passage from the report:

> The current economic transformation is as big and as challenging as the

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[193] According to Google Scholar, Florida's seminal text *Rise of the Creative Class* (2002) has been cited 8,612 times. For the purposes of contrast Daniel Bell's *The Coming Post-Industrial Society* (1976) has 11,615 citations, and Alvin Toffler's *The Third Wave* received only 5,169 citations. Results accurate as of February 2013.

> transformation from agriculture to industry. Our economy is shifting away from jobs based largely on physical skills or repetitive tasks to ones that require analytical skills and judgment. This shift is also evident in the long-term trend away from employment in goods-producing to service industries, from occupations that depended on physical work to produce goods to ones that provide service and rely on creativity. The change is inexorable. We cannot turn away from it; nor can we slow it. The clock of history is always ticking. Competitive advantage and prosperity will go to those jurisdictions that can best prepare themselves and adapt to this long-run trend. We must embrace it and act in ways that create a distinctive advantage for the province and ensure our long-term prosperity. (Florida, 2009, p. 3)

With only minor changes in language and emphasis, this passage mirrors the perspective of the *Ontario 2002* report commissioned fifteen years earlier! Coincidentally, even before Florida's position at the Martin Prosperity Institute, he helped produce a report in 2002 titled *Competing on Creativity: Placing Ontario's Cities in North American Context* (Florida et al, 2002). Prepared for the Ontario Ministry of Enterprise, Opportunity and Innovation, it provided a framework for understanding the post-industrial economy:

> Creativity has replaced raw materials or natural harbours as the crucial wellspring of economic growth. To be successful in this emerging creative age, regions must develop, attract and retain talented and creative people who generate innovations, develop technology intensive industries and power economic growth. Such talented people are not spread equally across nations or places, but tend to

> concentrate within particular city-regions… For policy makers, this work confirms the importance of urban centres in the knowledge economy and the need to investigate further the importance of higher education in this knowledge economy. At the municipal level, this work points to the importance of collaborative efforts between local governments, firms, and individuals to reinforce and strengthen the unique urban character of their city-regions. (Florida et al., 2002, p. ii)

Florida's rise to prominence coincides with a certain crisis moment in Western capitalism in which knowledge and information are seen yet again as remedies for waning economic growth, but also with the growth of the era of ubiquitous connectivity as a defining ontological and technological condition. In fact, the creative class is precisely the generalized prosumer market always sought by RIM. Florida's thesis, and his appointment to a major research institution in Ontario, synthesizes two strands in the post-industrial rhetoric of the past 30 years: on the one hand, the importance of a class of knowledge/information/creative workers in fostering technological innovation and, perhaps more broadly, social wealth; on the other hand, the belief that these social benefits emerge out of a confluence of regional and municipal dynamics that synthesize the economic (and therefore *universal*) needs of private industry.[194] Yet the construction

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[194] In a report entitled "Ontario's Entertainment & Creative Cluster: A Framework for Growth," The Ontario Ministry of Tourism and Culture estimates that job growth between 1999 and 2007 in Ontario's "Entertainment and Creative cluster" has been 38.3%, doubling the job growth in the overall provincial economy (Ministry of Tourism and Culture, 2010). In this definition, the "creative economy" constitutes "all activities directly involve din the development and production of creative products and services" including "the supporting industries which enable the production and distribution of creative content" (p. 3). According to this report, the creative industries in Ontario are responsible for $12.2 billion CDN of provincial GDP, while manufacturing accounts for $84.8 billion CDN, and the financial sector accounts for

of regional clusters like CTT, which emphasize the development and employment of creative and knowledge workers, primarily serves the process of private wealth production and accumulation. In this regard, Florida's explanation is revealing: "access to talented and creative people is to modern business what access to coal and iron ore was to steelmaking" (Florida, 2004, p. 6). One could add that under the condition of ubiquitous connectivity, "access" holds a highly technological, if not exploitative, implication. Indeed, the language of creativity suggests the growth of highly desirable and fulfilling jobs at the core of the new economy.[195] In many ways, the triumph of "creativity" as a central category of labour policy obscures the predominance of alienating service jobs while it also suggests, if only tacitly, the disappearance of well-paid occupations associated with industrial manufacturing.[196]

In sum, Florida's writing resonates with the celebratory rhetoric of the web 2.0 era, but he has widened it in ways that also serve the general euphoria regarding the economic, political, and cultural centrality of the Internet and social media.[197] Moreover, the creative class is a particularly popular strain of literature related to the post-Fordist

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$101.9 billion CDN (p. 4). According to this same report the "Creative industry GDP is now larger than Ontario's energy industry, is approaching 70% of the auto manufacturing sector and surpasses those of agriculture, forestry and mining sectors combined" (p. 4).

[195] In fact Florida has widely publicized his theory of the creative class (and his books) by proclaiming that "creativity *is* the new economy." As example, see http://www.huffingtonpost.com/richard-florida/creativity-is-the-new-eco_b_1608363.html

[196] For a quite different assessment of Ontario's workforce see Cerevan, 2009.

[197] A recent report by the Poverty and Employment Precarity in Southern Ontario (2013) describes 20% of Ontario's workforce as being "precarious" (short-term, part-time work), a figure that has increased by 50% in the last 20 years (p. 5).

reorganization of the economy focusing on “human capital,” something Caffentzis identifies as the thematic of “cognitive capitalism,” which has gained popularity in both mainstream economic analyses and some critiques of capitalism (2011). Moreover, Caffentzis notes that the emphasis on cognition as an economic resource, or dynamo, is nothing specifically new, but extends back to some of capitalism’s most notable proponents and critics: “for Weber, Simmel and Hayek (but not for Keynes) the phrase ‘cognitive capitalism’ was redundant” (Caffentzis, 2011).

Simply put, the purported technological innovations lending credibility to ideas of cognitive capitalism and the creative class, as well as their emancipatory rhetoric, assume the progressive emancipation of human creativity and communication. One might critique the growing chorus of post-industrial myth-makers proclaiming a human progress by drawing upon the Marxist distinction between essence and appearance. In other words, while it *appears* that we are entering a radically new era of human progress lead by new economic models, technological innovation, and human creativity, this is partly a reflection of the multiplying apparatuses (ICTs) that have colonized and now mediate everyday life. Thus post-industrial myths have a real, material, and thus common sense foundation. Yet the basic dynamics of capitalist exploitation—wage labour, private property, commodification, private accumulation of social wealth—persist, arguably involving complex implications related to what Innis called monopolies of knowledge.

Furthermore, myths purporting to unleash capacities enabling creativity and cognition link technological innovation to public policy. Indeed, Florida’s overall characterization of his creative class is highly techno-centric, making “always on” media a defining tool of this group since such media maximize such capabilities. Perhaps more tangibly, mobile technologies are analogous to the mobility said to inhere in the creative class itself since it is this very characteristic that policy makers are tapping into when they deploy this concept. That is, the very mobility of the creative class is precisely why urban and regional centers compete for their attention (see Cerevan, 2009).

5.6 BlackBerry Brand as Tool of the New Economy

By 2006, BlackBerry had not only become a global ambassador for technologies of ubiquitous connectivity (targeting multiple markets, from enterprise/institutions, to small-to-medium businesses (SMB), to professional users), it articulated a particular brand identity mirroring and deepening the myths of the new economy. In so doing, RIM had crafted a particular artifact that embraced and valorized this "new technological condition" (see Reeves (2007) for an extensive analysis of RIM's promotional discourses). As Reeves writes,

> the discourse of the devices [the BlackBerry] is reflective of global shift toward a 'new economy' ideology that promotes an ethic of productivity and a sense of borderless fluxes. The result for the promotions of the BlackBerry…is that the connectivity it enables is presented as a means of increasing productivity. As this new ideology—or ethos—has developed, boundaries [between work and social life] have become increasingly blurred. (Reeves, 2007)

Promotional strategy and imagery congealed into a very specific identity for the BlackBerry involving the integration of work and social life. This had its virtuous and not-so virtuous implications (i.e., "crackberry"). For corporate and business customers, the BlackBerry represented a tool for making the communicative and creative capacities of labour more productive and efficient (an argument to be elaborated in the next chapter). For the individual consumer, it was a tool of adaptation to a new technological condition—a condition in which the flows of work and leisure resembled the global flows of information and capital.

The BlackBerry's brand identity stressed the device's ability to remain connected at all times, and to link this ability to an economic and cultural necessity: that competitive advantage, efficiency, productivity, and *even social life itself* depended on the individual remaining connected and being able to articulate one's communicative capacities in this way. BlackBerry's brand was precisely about providing this increasingly important ability—constant connectivity—to individual users, organizations, and institutions. As such, the brand was a crucial predecessor to the coming age in which the prosumer was no longer a discrete market segment, but a functional social actor, "always on,"[198] performing the role of post-industrial archetype. Along with it, however, many began to see the BlackBerry as a tool of worker control, blurred boundaries between labour and leisure, and a non-stop work cycle that was as chaotic as it was precarious (Middleton, 2007). In linking up with this transformation in the working world, BlackBerry represented the technical realization of themes that had become familiar in rhetoric of the post-industrial world. Florida's creative class was only the most recent example of a popular and influential literature in which human creativity, knowledge, and capacity would be the wealth generation engine *par excellence*. This sentiment became

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[198] Here I use the term "always-on" in a double sense: the first one already articulated as a technological condition, the second I reference a more theatrical and performative sense of being *on* meaning that one is in effect always performing, whether it be in service of work, or in the iterative project of the self so essential to the consumerist ethos; see Bauman (2007).

internalized in the psyches of individuals and in the labour management policies of institutions. RIM’s marketability was premised precisely on fulfilling the promises of a new economy animated by human creativity and communicative capacity.

Thus the BlackBerry brand acts as a paradigmatic expression of the aforementioned post-industrial visions in three important ways: 1) its “value proposition” relates directly to the plausibility of an economy based on “human capital,” where it is creative and communicative capacity that drives social and technological change, creates general social wealth, and ameliorates the conditions of exploitation and oppression that marked the industrial era; 2) its institutional history embodies this trajectory both through its private and public funding, and the general euphoria surrounding the value of “always on” technologies; and 3) it provides—at a very practical and personal level—a consumer device, service, and infrastructure that makes *technically real* the visions of post-industrial prophets like Bell et al. for everyday users.

In the next chapter I will outline parallel developments in the re-composition of labour management strategies in light of the growth of ubiquitous connectivity (focusing on RIM and the BlackBerry), developing theories of a mobile workforce and virtual organizations. I will thus highlight how the post-industrial myths contextualized (and reflected) new forms of labour management. As a post-industrial brand, RIM’s symbolic world is tied into a mythology that has brought together the evolution of ICTs and the wide-scale transformation of work itself.

Chapter 6 – From Telework to Ubiquitous Connectivity: The Rise of Mobile Workforces and Virtual Organizations

"In the digital economy, the firm as we know it will be transformed. Just as the organisation is changing, so are the job and the nature of work itself. As the world of work shifts from the hierarchical corporation to the new extended structures, there is a shift in the potential for work location. The office is no longer a place, it is a system. The roles of individuals within that system are no longer just jobs but fundamentally new working relationships." (Tapscott, 1996, p. 183)

"All along we realized that we were giving you access to something incredibly valuable, which was your data store, your IT department, your databases, your infrastructure. That information defines the organization, the financial system, the ERP system, the SAP system, whatever you've got installed defines the organization. Having access to that increases value and makes your job easier. It allows you to accomplish that job from wherever you are. So the whole paradigm of BlackBerry was not to replace that system, but to give you access to that system in a meaningful way, regardless of where you are, and whether you're actually connected into your corporation. That's really what defined the BlackBerry mobile experience. We weren't trying to replicate the desktop. We weren't trying to replace the email system. We weren't trying to replace the database. All we were trying to do was to securely move that information out to the mobile user, regardless of where they were, in a way that didn't compromise economics and didn't compromise physics." (Mike Lazaridis, 2008, p.10)

6 Introduction

In the previous chapter I briefly outlined the policy environment that nurtured both RIM's institutional development and its signature brand. The policy arc that began with the rhetoric of the new economy and evolved into Richard Florida's theory of the creative class offered a concise summary of the nature of post-industrial mythologies in Canada and beyond. The key point identified in this policy literature is the shifting conceptualization of labour's productive capacity centering on intangible or intellective products and services.

As I argued in Chapter 5, RIM's creation of the BlackBerry—a brand intimately tied to the economic advantages of ubiquitous connectivity (UC)—benefited from this policy environment in two crucial ways. First, the company secured direct funding, tax-credits, and grants that kept it solvent in its initial period of research and development and partnership building. Second, RIM's subsequent line of devices and services benefited from a policy climate that increasingly valorized the intellective capacities (CCC) of workers and consumers. While securing funding was of immediate importance for the survival of the company in a highly competitive market filled with large international technology companies, this policy climate facilitated the progressive uptake of RIM's devices globally, particularly by large private and public organizations.

This chapter contextualizes the success of the BlackBerry in relation to changes in labour and organizational management literature—literature that emerged to specifically deal with the exploitation of intellective capacities through ICTs amidst the growing connectivity of workers. Herein I argue that the theme of UC has underpinned this management literature, though at times only implicitly, as an end goal—a final threshold that for mythmakers like Toffler (1980) would result in the empowerment of workers and an end to their alienation in the labour process.

It is not the intention of what follows to produce an exhaustive survey of labour and organizational management theory and its various responses to new ICTs. Rather, I select a few key themes in this literature that have framed the rise of UC and, with them, the commercial development of the BlackBerry (and related technologies). To accomplish this, the chapter is divided into four sections. The first looks at the growth of telework as a unifying term to indicate the remote management of information and knowledge workers through ICTs, exacerbating the separation between workers and the traditional spaces of work. The second section examines how the discourses around telework began incorporating themes of *virtualization*—virtual work, virtual teams, and virtual organizations—in relation to the growth of networking technologies like LANs and the Internet. The third section provides an overview of the development of the market for wireless enterprise technologies.[199]

6.1 Telework and the Crisis of Fordism

"*Telecommunication networks are the freeways of telework.*" (Nilles, 1998, p. 69)

The roots of UC as a labour and organizational management strategy lie within the various discourses and policies associated with the term *telework*. Telework emerged out of a confluence of four historical factors. The first three stem directly from the crisis of Fordist capitalist accumulation strategies (Harvey, 1989), while the fourth is situated in the social and political upheavals of the 1960s that saw workers pushing back against the so-called "organization man" (Whyte, 1956).

The first factor was rising transportation costs associated with the oil crisis of the early 1970s. Cheap oil was an essential part of the circulatory needs of Fordist capitalism.[200] In the case of infrastructural investment, the discourses on telework described the substitution of transportation costs for investment in ICTs, thus the need to strategically re-conceptualize the spatial and temporal dimensions of labour management

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[199] It is important to note that these sections are not historically linear, but rather demonstrate overlapping tendencies that develop and adapt in relation to changing technologies and market demands. So while I discuss how the discourses of telework incorporated themes of virtualization, as I note, the term telework on its own still carries some currency with policy-makers around the world.

[200] According to the U.S. Energy Information Administration, the price of oil in *real* costs rose from $20 USD in 1973 to $45 USD in 1975 and peaking at $98 USD in 1980. See http://www.nrcan.gc.ca/energy/publications/sources/crude/issues-prices/1463

(Huws et al., 1990). As a term emerging out of a re-organization of productive forces according to new infrastructural investments, telework offered an important conceptual touchstone upon which the myth of UC could build. That work processes could be mediated and managed remotely was not in-and-of itself new, but the simultaneous spread of microprocessors (and other innovations linking computing and telecommunications) in conjunction with a moment of capitalist crisis and re-organization offered fertile soil in which myths might grow.

The second was the growing conceptual interest in intellective products like knowledge, information, and creativity as sources of economic growth (e.g., Porat, 1977). Indeed, the increasing emphasis on "knowledge/information" became an important element in the conceptualization of telework, as Illegems and Verbeke (2003) writes: "Knowledge jobs are more conducive to telework than other kinds of jobs. Therefore, sectors with a higher proportion of knowledge jobs have a higher proportion of telework; the service and public sectors have a high proportion of teleworkers" (p. 38). Management experts and policy-makers began focusing on the economic centrality of intellective capacities (i.e. CCC) as commodities or vehicles for selling services (for example, like wireless data and connectivity). As part of divestment in North American manufacturing capacity, commercial enterprises increasingly focused on patents, brands, and licensing, shifting the source of corporate profits to the rents accrued from monopolies of knowledge and creativity associated with commercial exploitation of CCC.[201] Consequently, these intellective capacities were perceived to be an increasing

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[201] See my discussion in chapter 3 for elaboration on this point.

input into the production (or realization) of these monopoly rents, and consequently become the focus of managerial control. Declining costs of manufactured commodities lead to an emphasis on services exploiting so-called "human capital," and thus "material products become 'vehicles' for selling services" (Gorz, 2010, p. 76). At the same time, telework offered an opportunity to reduce costs associated with the spaced in which work occurs (offices, buildings, infrastructure, etc.). In McLuhan's terminology, the *hardware* of Industrialism (offices, infrastructure, infrastructure etc.) gives way to the *software ideals* of post-Industrialism (knowledge, information, creativity, services etc.) (see McLuhan & Nevitt, 1972).

The third antecedent to the rise of telework was the rapid innovation that began in the early 1970s associated with ICTs—innovation specifically associated with components of PC computing like microprocessors and semiconductors (microchips). Innovations in this area, and the opening up of mass consumer and corporate markets, often followed key regulatory challenges to the monopolies held by IBM and AT&T over computing and telecommunications respectively (Schiller, 2000). Instead, ICTs were seen as an area for market competition, and thus potential innovation. The expansion of the ICTs market and the growing use of computerized numerical control (Noble, 1977) exacerbated the economic problems of the early 1970s. The oil crisis also created further interest in the perceived ability of ICTs to drive economic growth in accordance with the assumptions implicit in the myth of UC. Consequently what was privileged was the circulation of information, knowledge, data, and most importantly, money in ways that would overcome economic barriers or inefficiencies concerning time and space (Hobijn & Jovanovic, 2000). If industrial myths represented fixed, immobile, monolithic capital structures (and with them a similarly monolithic and organized labourer), post-industrial myths envisioned capital, but especially labour, as mobile, flexible, interchangeable, and potentially ubiquitous. The myth of UC is a contemporary manifestation of these keywords.

Finally, the rise of telework also was couched in a rhetorical veneer suggesting that workers stood to gain greater freedom, flexibility, and control of their work. The ideal of worker empowerment as a central part of corporate management had been championed by Peter Drucker and others (Mickelthwait & Wooldridge, 1996), but it was also part of a struggle for the consent of the workers themselves. The social and political transformations of the 1960s inculcated a deep resentment against the atomizing and stultifying effects experienced by the "organization man" (Chiapello & Boltanski, 2005).

Catalyzed by the crisis facing Fordist capitalism in the 1970s, telework increasingly became a key component of a management philosophy offering a "vision of the future" centered on the connectivity of remote workers, (Jackson et al., 1998, p. 3). As figure 14 demonstrates, the usage of the term itself emerges in the early 1970s then peaks in 1999 but continues to be used widely throughout the 2000s. Regarding the resiliency of this vision of the future captured in the rhetoric of telework, Huws writes:

> The predictions in question concern the use of information technology to enable people to work at a distance from their employers, generally at home. This development occupies so central a place in forecasts about the future of work that it is difficult to escape the suspicion that it has acquired a symbolic importance quite out of proportion to its actual prevalence. (Huws, 2003, p. 87)

Huws' suggestion that telework's symbolic significance outweighs its *actual* prevalence is a salient example of how myths can offer disproportionate symbolic power to those in a position to shape (and implement) *visions of the future*. In so doing they give the myth a reality—in hiring practices, infrastructure or technology investments, and management strategies. As a conceptualization supported by a managerial and technological actuality, telework acted as a myth that concealed or explained away deeper changes in the forces (i.e. ICTs) and relations (i.e. flexible, increasingly casualized labour) of production that began in the 1970s.

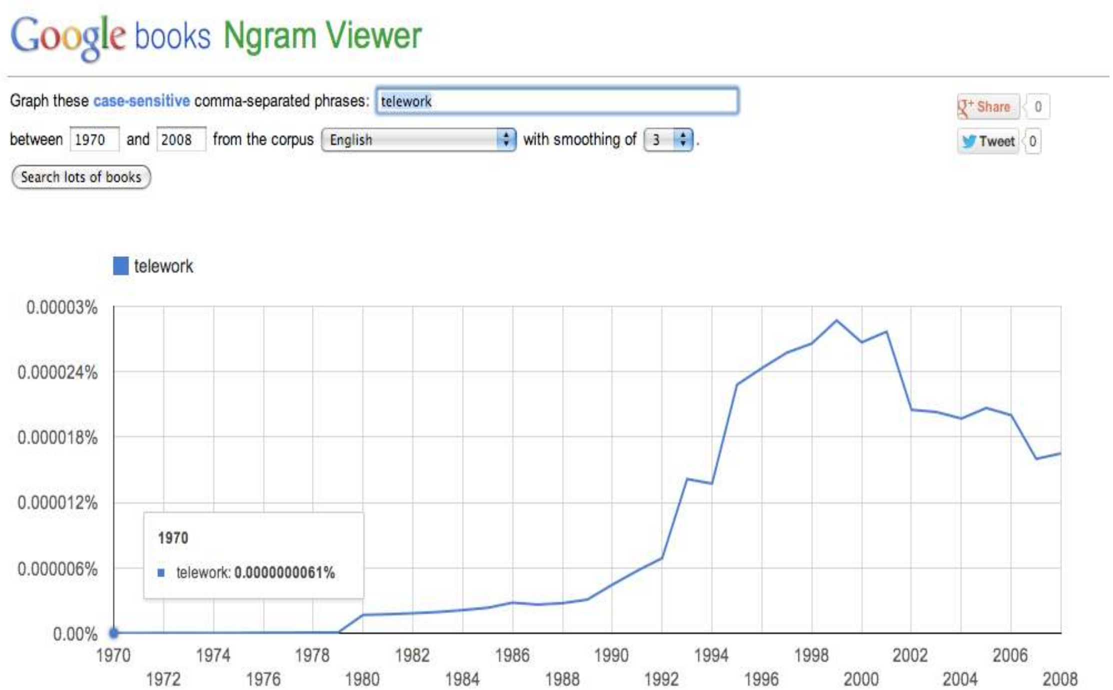

Figure 17: Google Ngram graph for the appearance of "telework" in searchable texts between 1970 and 2009.

Telework has been a recurring theme for futurists and forecasters crafting a vision of a techno-utopian future defined by the triumph of human intelligence. Most notable among these futurists has been Alvin Toffler (1974, 1980), who has depicted the future of work as taking place in an “electronic cottage” in which the fusion of production and consumption (prosumption) enabled by ICTs will bring about a new era of individual empowerment, autonomy, and freedom. In this respect, the term ‘telework’ encapsulates a particular ideal about how new ICTs could enable a condition of non-alienated future work in addition to a new spatial and temporal independence of labour from capital and vice-versa.[202]

As Huws et al. (1990) and others (Verbeke et al., 2008) have noted, telework does not have a singular definition, and seemingly applies to a wide range of potential activities. Upon examining a variety of articulations, Huws et al. offer this useful definition:

> We define telework as work the location of which is independent
> of the location of the employer or contractor and can be changed

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[202] Perhaps because of this ideal, the term “telework” became the center of some national and international public policy discourses (see Jackson et al., 1998). Despite the overall ambiguity of the term, its saliency as a public policy hallmark continues with an estimated 10-30 million teleworkers in the United States (depending on the definition) (see Telework Research Network for detailed statistics: http://www.teleworkresearchnetwork.com/telecommuting-statistics). Indeed, telework has become an important term in the reorganization of government work, with the U.S. government passage of the 2010 Telework Enhancement Act (H.R. 1722, 2010) that stipulates the increase of government teleworkers across all government agencies. The Act offers this definition: “The term ‘telework’ or ‘teleworking’ refers to a work flexibility arrangement under which an employee performs the duties and responsibilities of such employee’s position, and other authorized activities, from an approved worksite other than the location from which the employee would otherwise work.” The Act requires that each agency develop a telework strategy, including timelines for implementation, cost of implements, potential savings, and job creation all being, perhaps contradictory, goals of the Act. Similar, processes have followed in public sector jobs in most nations. According to a 2012 report to the U.S. Congress by the United States Office of Personnel Management, 684,589 employees were determined to be eligible for telework (or 32% of the 2.2 million employees across effected agencies). Of those, 144,851 employees had formally entered telework agreements with their managers (United States Office of Personnel Management, 2012, p. 7). While no national statistics are readily provided, Transport Canada offers a detailed overview of Telework policies and working conditions (http://www.tc.gc.ca/eng/programs/environment-utsp-teleworkcanada-1052.htm). Telework as a public policy term thus is still widely used.

> according to the wishes of the individual teleworker and/or the organization for which he or she is working. It is work which relies primarily, or to a large extent, on the use of electronic equipment, the results of which are communicated remotely to the employer or contractor. (Huws et al., 1990, p. 10)

More recently, Long et al. (2010) define telework as “an alternative work arrangement in which workers are allowed to perform their tasks elsewhere, usually outside conventional offices using communication technologies to interact with others” (p. 4).

As an alternative working arrangement, telework can be divided into three broad sub-categories of work: electronic homework, telecommuting, and flexiwork (Jackson et al., 1998, p. 31). Illegems and Verbeke offer a more refined typology comprising six different types of telework (2003, p. 19):

1. Employee who works at a satellite office: outside central and/or branch offices, includes offshore.
2. Employee who works at a telework centre; generally owned by a third party.
3. Electronic homeworker; spends substantial part of the regular working day at home; equipped with technology permitting “continuous interaction with the employer.”
4. Traditional homeworker; works at home for a substantial part of the day and “uses telecommunication technology only to transmit the results of her/his work.”
5. Nomadic worker; works at various sites in response to changing business needs, uses telecommunication devices to communicate with the office.

6. Professional networker; self-employed "and uses telecommunication technology to deliver her/his services to more than one customer."

Management literature aside, telework, as Huws writes, "exists more powerfully as an ideological construct than as reality …" (2003, p. 99). Thus for the most part, the rhetoric of telework dealt more with the remote management of workers and their prospective empowerment or disempowerment, rather than on the specific technical capabilities required by workers to remain connected to the structures of labour management.[203] Management literature heralding the rise of the *mobile workforce*[204] extended the telework discourse to stress the connectivity of workers, whether by transportation or networked ICTs (Pratt, 1997).[205] Indeed, the early proselytizing around wireless data networks and services emphasized the importance for mobile workforces

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[203] Braverman (1976), Noble (1977), and Lasch (1987) have argued that one of the key forces advancing the commercial development of ICTs after WW2 has been struggle for control, rather than for greater productivity or efficiency, between management and workers. Lasch writes, "An examination of the impact of technology on the transformation of work and the changing class structure of industrial society dispels the illusion that technology is a neutral and impersonal force. It is misleading even to speak of the impact of technology on the work process, since this formulation implies that technology originates outside the work process—in the laboratory, presumably—and has an 'impact' designed or anticipated by no one in particular. In fact, much of modern industrial technology has been deliberately designed by managers for the express purpose of reducing their dependence on skilled labor" (1987, p. 79).

[204] A recent *Globe and Mail* article offered evidence that "mobile work is the new norm" due to both the proliferation of mobile devices and encouragement from employers (Immen, 2013). Based on statistics provided by the International Data Corporation, the article projects that, "The Canadian mobile worker population is set to increase from 12.1 million in 2012, accounting for 68.9 per cent of employed Canadians, to 13.3 million in 2016, or 73 per cent of the work force" (Immen, 2013).

[205] A 1991 *Computerworld* article predicted that, "The users' telephone numbers will be their mobile work and leisure address, at which they will be able to be reached 24 hours per day via electronic mail. In the long run, says Paul Saffo, a research fellow at the institute for the Future in Menlo Park, Calif., "the workstation is going to become like a telephone, where the essential value is derived from what it is connected to" (Ryan, 1991). Similarly, a 1993 *Infoworld* article on wireless networking proclaimed: "The mobile workforce is demanding universal connectivity from wireless service providers" (Strom, 1993).

(Brodsky, 1990; Didner, 1991; Hengel, 1994; Ryan, 1991; Strom, 1993).[206] The logical conclusion of the mobile workforce is to make them available 'anywhere and anytime.' A 1994 article in *Industry Week* proclaimed the coming "anytime, anyplace workplace" encompassing "an ever more mobile workforce that is connected by technology" and "influencing the scope of work and how we get tasks done" (Verespej, 1994).[207]

Other claims stressed the way in which mobile technologies could meet customers' needs by using fewer employees:

> Corporations are starting to appreciate the importance of mobile computing and are looking at how to use it to improve the overall business process. Managers are seeking ways to meet the rising expectations of customers while using fewer staff

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[206] An important aspect that underpins the ideals of the mobile workforce that is often erased or unaddressed in related management literature is the *actual* mobility of labour apart from ICTs. This means the movement of labour within and between nations, a key, if often neglected, aspect of globalization in the neoliberal era (Overbeek, 2002). In 2004, the OECD estimated that there existed 175 million international migrants, or approximately 3% of the world's population (OECD, 2004, p. 12). For example, the growing reliance on migrant workers in some industries and regions depends on mobility whether legally sanctioned or not. For example, agricultural industry in North America is reliant on migrants, primarily from Latin America; the National Center for Farmworker Health estimates that 68% of all farmworkers in the U.S. were born in Mexico (NCFH, 2012); United Food and Commercial Workers estimates that 40,000 migrant workers were employed in the Canadian agricultural industry in 2010 (UFCW, 2011). Mobile devices, particularly those employing a pay-as-you go payment plan, are often essential tools of many migrant workers as they serve as key links to their respective communities (see Thompson, 2009; Yang, 2008; Uy-Tioco, 2007).

[207] A recent managerial text offers the following summary:

> The mobile workforce may be located at home or on the road, or it may simply be moving within your own corporate settings. Mobile workers perform critical jobs for an organization, using secure Internet connections, collaborating from near to as far as anywhere on the globe you can imagine, using the most appropriate hardware and software needed to get the work done. The most effective mobile workforces have the support and leadership of management, who provide both the technological and organizational tools to assure success. (Clemons and Kroth, 2011, p. X)

> to do it. One way to balance these seemingly conflicting requirements is to provide key workers with simpler and much quicker access to more information.
>
> … Mobile computing is still an under-utilised corporate resource, and will continue to be so unless centralised facilities and resources are extended to remote sites and mobile workers. But extending these systems is not merely a matter of replicating the wireline architecture. A well-synchronised flow of information is needed because the line-of-business processes involved now represent the very basis of the organisation's economic well-being.
>
> …In other words, organizations want to see the provision of, and have full access to, the 'anywhere, anytime' communications systems and applications that the industry has been evangelizing about for so long. (Emmerson, 1996)

Flexibility is the watchword underlying both telework and the mobile workforce, and this is what makes each such a potent example of how post-industrial myths are materialized in technologies, practices and ways of thinking.[208] Through the application

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[208] Based on a survey of several S&P Global 100 companies, business supply company Knoll Inc. advocated mobile work as an essential corporate policy for "increasing organizational effectiveness and performance" as well as for retaining "top talent":

- "Flexible policies attract and retain top talent through development and deployment, deliver measurable results that benefit the business and the employee, including annual savings on corporate health-care costs and absenteeism and turnover."
- "Mobile and flexible work arrangements are not simply 'perks'; they increase organizational effectiveness, financial performance, and market valuation."
- "Knowledge-based work relies upon 'time' as the resource that drives productivity. 'Time' is shared between employees and the organization, replacing the traditional measurement of 'time spent behind a desk.'"
- "Mobile work strategies support knowledge-based work, enhancing productivity while reducing real estate costs, increasing worker productivity, and requiring less real estate and few physical systems to facilitate the workforce." (2011, p. 40)

of ICTs, flexibility comes to define both capital accumulation and labour management. Thus, in the myths of post-industrialism, flexibility is synonymous with connectivity. At the same time, such flexibility also conceals the pervasive managerial surveillance and control implicit in the application of telework (Fitzpatrick, 2002; Huws, et al., 1990; Lyon, 1994; Newitz, 2006; Webster & Robins, 1999).

Indeed, the main driver for the adoption of telework was not transportation cost savings, but rather labour management decisions regarding the spatial organization of workers and workflows. While the rhetoric around telework tends to focus on the benefits for employees, as Long et al. note, "There was a high degree of consensus in the policy wording that telework was to be a management option rather than an employee choice, privilege or a universal benefit—although most policies simultaneously stressed that telework was to be voluntary for employees" (2010, p. 10). Telework policies often exhibited an implicit tension whereby it was "seen as voluntary for employees yet not up to them to decide" (2010, p. 10). Consequently, "Many remote workers perceive the choice they have made not as that between working remotely or traveling to a central office, but as that between working remotely or not working at all" (Huws, 1990, p. 3).

In their detailed analysis of global telework policies and statistics from the 1970s and 1980s, Huws et al. conclude that the promise of telework has not only extended the hand of managerial control, but also disempowered workers and exacerbated their precarity:

> Telework is often associated with the growth of sub-contracting, of self-employment and of various temporary or casual forms of work which are often

> grouped together under the general heading ‘new ways of working’, and information technology has certainly been intimately involved in these developments. One reason for this is that office automation facilitates the ‘unbundling’ or disaggregation of organizational structures by standardizing processes, formalizing decision making structures and increasing the potential for quantifying and monitoring the performance of individual parts of an organization (Brusco, 1981). The result has been a vertical disintegration of organizations and an increase in the sub-contracting of a wide range of services, often to companies started up by ex-employees of the contracting organization. (1990, p. 7)

The growth of telework as a key theme in shaping post-Fordist labour management literature reflected a basic belief that work based on intellective capacities largely would be independent or untethered from traditional places/spaces of work, in addition to empowering both managers and workers. Nevertheless, as both a mythic discourse and a material reality, telework demonstrates the profound contradictions in the application of new ICTs to the management of workers.

6.2 Virtualization: Groupware, Business Process Re-Engineering, and Workflow Management

“When we launched the first Blackberry, we fundamentally paid attention to what the CTO wanted, which was ease of installation, security, common standards and ease of integration. We wanted the CTO to be able to make a business case from a line of business perspective. This may all sound self-evident, but at the time we launched, this was not the prevailing approach in the industry. The more typical ethos was to try and bamboozle the CTO and as a result we saw a lot of mobile data projects undergo painful deaths.” (RIM ex-co-CEO Jim Balsillie quoted in Deloitte, 2006, p. 22)

As a dominant conceptual framework in post-Fordist labour management, discourses around telework's scope expanded with the advent of the Internet and other networking technologies introduced in the early 1990s. Despite its ambiguous and controversial associations, as a discourse telework is still used in public policy worldwide (for a European perspective see Welz & Wolf, 2010) though its contemporary characterizations have adopted the myth of UC as a technical and cultural reality.

At the organizational level, Castells (1996) declared the rise of the "network enterprise"[209] as a key transformation in the overall mode of production of contemporary capitalism (p. 187). This rhetorical emphasis on networks was echoed in the business press and by management consultants (Baker, 1994; Tapscott, 1996), all suggesting a fundamentally altered corporate structure more properly aligned with the visions and values of other post-industrial discourses (like telework). For corporations this meant being able to utilize the 'sunk' investments represented in fixed capital, contributing to more 'flexible' and 'decentralized' *networked* information technologies as mediators of innovation and productive efficiency.

The championing of networks has a long history predating the popularization of the Internet (e.g., Saint-Simonians). In the post-industrial era the evolution of ICTs has

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[209] Castells (1996) defines the "network enterprise" as:

> [t]hat specific form of enterprise whose system of means is constituted by the intersection of segments of autonomous systems of goals. Thus, the components of the network are both autonomous and dependent vis-à-vis the network, and may be a part of other networks, and therefore of other systems of means aimed at other goals. The performance of a given network will then depend on two fundamental attributes of the network: its connectedness, that is, its structural ability to facilitate noise-free communication between its components; and its consistency, that is, the extent to which there is a sharing of interests between the network's goals and the goals of its components. (p. 187)

been strongly associated with organizational transformation. First the spread of personal computing, then the Internet, and finally wireless data have all provided the technical apparatuses for the appearance of organizational entities (i.e. corporations) seemingly unencumbered by barriers of time and space. It is therefore not surprising that wireless data technologies (and with it, UC) coincided with the rhetoric of virtualization to describe the application of network technologies in reshaping the spatial and temporal organization of the business enterprise. Virtualization added to the existing discourses surrounding telework a more ephemeral, yet totalizing, description of organizational forms and labour processes. This emergent understanding of *virtual* as having "effect but not form" directly preceded the era of UC. It realized this definition by extending the power of management over workers through information flows to and from workers regardless, in theory at least, of the position of employees in time and space. Perhaps more tangibly, virtualization can be used to describe new forms of commercial resources: assets (fixed costs are substituted for variable costs), employees (those that do not need to be physically located in a centralized office), and time ("resources of time seem to expand or shrink at will") (Birchall & Lyons, 1995, p. 18). As Morgan (1993) described, in the early years of the Internet, virtualization was seen to constitute a major shift in management's vision of both the organization of commercial activities generally and labour specifically:

> Organisations used to be places. They used to be things…But, as information technology catapults us into the reality of an Einsteinian world where old structures and forms of organization dissolve and at times become almost invisible, the old approach no longer works. Through the use of telephone, face,

> electronic mail, computers, video, and other information technology, people and their organizations are becoming disembodied. *They can act as if they are completely connected while remaining far apart. They can have an instantaneous global presence. They can transcend barriers of time and space, continually creating and re-creating themselves through changing networks of interconnection based on 'real time' communication*…the reality of our Einsteinian world is that, often, organizations don't have to be organizations any more! (emphasis added, Morgan, 1993, p. 5)

The concepts of virtual work, virtual teams, and virtual organizations proved popular enough with business strategists and management experts to spawn numerous "how-to" manuals, guiding management professionals on how to implement virtual strategies in their own organizations. Consequently, theories of the "virtual organization" (Quinn, 1992; Davidow & Malone, 1992; Mowshowitz, 1994; Birchall & Lyons, 1995; Grenier & Metes, 1995; Fukuyama et al., 1997; Nilles, 1998; Jackson, 1998), "virtual work" (Jackson, 1999; Watson-Manheim et al., 2002), and "virtual teams" (Verbeke, 2008; Ebrahim, 2009; Long et al., 2010) have become (and remain) popular in publications addressing the business impact of new ICTs. The proposed benefits are familiar truisms for business literature: efficiency and productivity gains benefit management, while increasing flexibility and empowerment benefit workers. Paul Drucker and his followers even alluded to the "virtues of virtuality" years before this virtual thematic began to appear in management literature *en masse* in the 1990s (see Mickelwaith & Woolridge, 1996, pp. 112-114; Hesselbain, 1997, pp. 377-383).[210]

Virtual work, much like telework, is "characterized by a technology-mediated and geographically dispersed structure" (Long et al., 2010, p. 73). In contrast to telework, however, virtual work is tied to a specific organizational form: the virtual organization. A typical definition of a 'virtual organization' is one that is "no longer tied to place and time" while carrying out its activities, resulting in time and space being "bridged more easily and at lower cost." (Metselaar & van Dael, 1999, p. 200). Virtual work is associated with "flexible and adaptive business structures" that break down spatial barriers, leading to the "disembodiment" of the organization (Jackson, 1999).

Echoing the rhetoric of telework, virtual work is understood to be "freeing up employees" in ways that make them "more mobile in that they can move their work to the place which best suits the client's needs, the organization's needs and their own personal needs. It also makes possible the effective transfer by organizations of low value labour-

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[210] Summarizing a popular management text on virtual organization, Metselaar and van Dael (1999) offer a litany of transformative characteristics associated with virtual organizations:

> hierarchies collapse and boundaries within and between organisations decline. Empowered teams are producing information-based virtual products. Conventional relationships between employers and employees disappear. The organisation continually changes, and work processes are organised on a project basis. Within these projects cooperation takes place between colleagues, with personnel employed by suppliers or with other organisations. A central building or a central office becomes less important because of increasing communication in cyberspace. Applications of ICTS that are mentioned in regard to virtual organisation are local and wide area networks, electronic data interchange (EDI), the Internet, intranets, workflow management systems, multimedia communication, groupware systems, knowledge-based technology and other applications of artificial intelligence, such as intelligent agents (McLoughlin & Jackson, 1997). (Metselaar & van Dael, 1999, p. 201)

intensive clerical work and more routine work to any location worldwide" (Birchall, 1995, p. 102). Some business analysts have stated that the virtual team—a team whose members are dispersed in space and connected through ICTs—has become the "default" component of today's corporate organizations (Pauleen, 2004). Several factors have contributed to the increasing use of such virtual teams, such as: the globalization of the economy, the advance of information technology, the rise of new organizational forms, and the precursory emergence and growth of telework as a labour management strategy (Long et al., 2010, p. 100). Each of these "factors" are themselves outcomes of deeper dynamics, but this removal from precise forces and processes facilitates the kind of de-historicization required for myth-making.

The growing prevalence of the term *virtual* in labour and organizational management literature in the 1990s is significant because of the connotations it has regarding prospectively ubiquitous and immersive opportunities offered by networked ICTs. The rhetoric of virtualization extends key elements of the telework literature as it stresses the importance of connectivity by which the articulation of intellective capacities is coordinated among spatially dispersed workers (Watson Fritz et al., 1998). "One important feature of virtual organizations…is the team work from people within the organization that may be distributed locally or globally" (Grimshaw & Kwok, 1998, p. 49). Strategies of virtualization also are of competitive importance in order to adapt to the accelerating rate and novelty of change within the marketplace (Rollier & Liou, 1998, p. 321):

> In order to have a rapid response to the market (customers), companies have to reorganize themselves around rapid response to customer demand, forging tight

> relational and technological bonds with core suppliers and long-term customers. That is the shape of the corporation of the future, a virtual corporation. (Klein quoted in Grimshaw & Kwok, 1998, p. 49)

As it came to prominence in the mid-1990s, virtualization also offered an important narrative legitimizing the role of Chief Information Officers (CIOs) as "information visionaries" entrusted with adapting organizations to changing ICTs and developing the "strategic management of corporate information flows" (Haigh, 2003, pp. 795-820). The relatively recent development and growing ubiquity of CIOs in business organizations is related to a shift in corporate management thinking that conceptualized "information" (and "information technology") as a strategic resource and competitive necessity (Kline, 2006). CIOs were also influential in guiding the expansion of corporation IT budgets during the 1990s,[211] searching for new information technologies that could generate measurable productivity gains and thereby confer executive legitimacy to this new corporate agent. Historian Thomas Haigh (2009) contextualizes the rise of the CIO as part of an "information revolution" within business organizations:

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[211] On the topic of ballooning corporate IT budgets, Haigh writes:

> "Whereas corporate computer budgets had been quite small in 1980, by the end of the century they had risen to account for a very significant chunk of all corporate spending. North American businesses *spent around six hundred billion dollars on computer hardware, software and services in 2001*. According to the Gartner Group, one of the leading computer industry research groups, large corporations devoted an estimated 5 percent of their revenues to information technology, representing an expenditure of around eight thousand dollars per employee (up from three thousand in 1988). As well as an increased use of computers in areas established in the earlier decades, this reflected some fundamental shifts in the areas to which computers were applied." (emphasis added, 2003, pp. 812-813)

In 2002, *AdWeek* reported that Fortune 1000 companies accounted for 75% of all business IT spending, making roughly 100,000 people responsible for most IT spending choices (Laberis, 2002).

> Just as the Chief Financial Officer was responsible for every aspect of the corporation's relationship to money (from structuring financial strategies to overseeing accounting systems), so the Chief Information Officer would be responsible for every aspect of the corporation's relationship with information. As well as overseeing the operation of centralized computer centers, this meant husbanding information itself, setting information technology standards, identifying strategic opportunities for the application of information technology and educating other top managers to see information as a resource. This conception of information as a resource represented a decisive moment in the construction of a new conception of information, quite different from anything present in business thought before the creation of the computer…
>
> CIOs struggled to gain the respect of other executives, and have never achieved the broad responsibilities they hoped for. They changed jobs more frequently than other top managers, and they earned less money. Few CIOs have gone on to lead major companies. Probably none has ever established an authority over information equal to that a CFO enjoys over finance. Yet, viewed in other ways, the CIO movement has been an enormous success. By the end of the 1990s almost every large corporation had created a CIO. Computer budgets continued to rise, and computer managers continued to ascend the organization chart. (2009, pp. 3-4)

In addition to promoting a new set of business platitudes embraced by corporate CIOs, the virtualization literature was expressed in and through two commercial products: the development of workflow management systems (WFMS) and the popularization of groupware or computer-supported collaborative work (CSCW), such as Lotus Notes. Both became lucrative areas for commercial software developers as well as management consultants seeking to capitalize on the excitement around virtualization. Each also gave CIOs a clearer path to legitimacy within the executive branches of corporations. Both groupware and WFMS focused on exploiting the intellective capacities of workers by focusing management strategies on the *flows* of information increasingly unencumbered by spatial constraints. Growing connectivity among workers offered opportunity to re-engineer various dimensions of work processes involving remote forms of management.

The re-organization of business processes and workers had long been of interest to managers grappling with the increased importance of information within the organization (Chandler & Cortada, 2000). In the early 1990s, as excitement was building around the business application of networking ICTs, Business Process Re-Engineering (BPR) emerged as a management concept centered on managing networks of connected workers (see Robson & Ullah, 1996).[212] Its goal was to enable the most efficient organization of workflows among those employees primarily connected through ICTs.[213]

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[212] On the significance of BPR, historian Thomas Haigh (2000) writes: “A boon for consulting companies, BPR was the single most important factor in transforming the management consulting industry from a relatively small sector focusing primarily on advice to a much bigger industry focused mostly on designing and building computer systems of various kinds” (p. 816).

[213] In a seminal *Harvard Business Review* article entitled “Reengineering work: don’t automate, obliterate,” Michael Hammer (1990) offers the essential blueprint for BPR. In the article, Hammer provides numerous case studies, each echoing a common refrain: “use computers to redesign—not just automate—existing business processes” (1990, p. 104). Two prominent examples, Ford Motor Company and Mutual Benefit Life, illustrate the streamlining of information-intensive work through the application of new technologies, and resulting in an increase in productivity and a substantial reduction in “head count” (Hammer, 1990, pp. 105-106). While Hammer’s examples illustrate the utility of rethinking workflow processes in order to maximize efficiency and timeliness, it is difficult to not associate BPR with “downsizing” (Pruijt, 1998).

Interest in BPR culminated in the founding of the journal *Business Process Re-Engineering & Management Journal* in 1995, although it later changed its title to *Business Process Management Journal* in 1997 as BPR fell out of fashion (the journal continues to publish issues quarterly) in light of new network technologies that engendered even newer management terminology.

Emerging at roughly the same time, BPR shares considerable thematic overlap with the literature on virtualization—with emphasis on information flows, connectivity, and the coordination and management of variously located workers. Unlike virtualization, which existed as a loosely associated set of terms and rhetorical tropes, and telework, which existed both as a discourse and a policy framework, BPR emerged as a brand of management. Not surprisingly, some of the earliest and most popular proponents of BPR embraced the rhetoric of virtualization (Amberg & Zimmermann, 1998). Though related to virtualization, BPR was much broader and ambitious in scope as, "Re-engineering implies the metamorphoses of organizations into machines" (Homa, 1995, p. 14).[214]

As a management philosophy, BPR extended Taylorist management techniques into the realm of intellective work. Its primary object of management is the intellective capacities of workers. As such, Vanderburg (2004) characterizes BPR as providing the theoretical foundations for an "intellectual assembly line." CIOs were quick to adopt BPR as it provided a language that meshed neo-Taylorist principles with new

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[214] Homa's sentiment here echoes Veblen's "machinic processes" as a foundational component of the business enterprise (1904, pp. 5-19). Veblen's machinic view of the business enterprise extended to more than just the industrial production of goods, but the overall management of business processes within and between organizations.

technologies and organizational theories, promising the ability to deliver quantifiable return on investment (ROI) (Canton, 1994; Miyamoto et al., 2011; Plewa & Pliskin, 1995; Ross & Feeny, 1999). At the height of its popularity BPR "became the new secular gospel of salvation: Do it, and you will be saved, or leave it, and you will disappear because of global competition" (Vanderburg, 2004, p. 331). A 1994 survey of 400 company CIOs by accounting firm Deloitte & Touche revealed that companies implemented roughly 4 BPR initiatives each; "The survey also concluded that technology efforts involving BPR are more successful than technology initiatives that do not involve BPR, and that networking and client/server architecture are the two most important technology components of a company's BPR efforts" (Plewa & Pliskin, 1995, p. 34).

BPR enabled a kind of intellectual deskilling stemming from the extraction of tacit or experiential knowledge from workers and their activities, then integrated into the automation of a given business process (or as Huws et al. put it, the "codification of knowledge"; see Huws et al., 2009). This was accomplished through a combination of databases, software, and networked terminals and resulted in greater worker redundancy since information managed at a central location but accessed remotely reduced the amount of workers and increased their interchangeability (for examples see Chamberlain, 1993).[215]

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[215] According to Vanderburg, "…job security is all but eliminated in the process of reengineering. Significant reductions in skill levels are common, making workers more easily replaceable. Just-in-time labor becomes a reality as agencies supplying temporary workers thrive. It is not surprising that business process reengineering as a management fashion undermined good management-labor relations almost everywhere" (2004, p. 337). In an article for *Chief Information Officer Journal* titled "CIO, reengineer thyself," Chamberlain (1993) offers examples of the *flexible* re-engineering work processes using information technologies at DuPont, Timberland, and Chase Manhattan. Though no specific numbers, the following passage is telling:

While BPR existed primarily as a growing body of management literature, its practical application was the development of workflow management systems, a term that fused both workflow design with new programs like groupware (Slater, 1997, p. 74). BPR and WFMS provide frameworks for deploying information technologies to enhance the *productive* application of employee capacities conceptualized as key resources within an enterprise. Indeed, it is precisely the reconstruction of workflow that is the primary focus of BPR and, more broadly, of the management literature on telework and virtualization; “Control over workflows begins with the conceptualization of work processes” and, in this conceptualization, “[m]anagement encourages the most granular subdivision of tasks, as each minute task in the workflow can be assigned a deadline” (McNally, 2010, p. 366). Workflow management systems are crucial to the virtual workplace since they involve the breaking down of complex business tasks, the coordination of activities, and processing at workplaces distributed in space but linked by network technologies (Amberg & Zimmermann, 1998, p. 114). In this respect, they reflect the division of intellective labour according to the prerogatives of managers.[216]

> In fact, BPR decisions usually lead to job reshuffling--or even job loss. Business reengineering is all about change, so it's is essential that redesigned processes are understood, expectations are managed, and employees, suppliers, and customers are prepared for the different type of company they're going to see. Within the organization, employees must comprehend the changes to their jobs, relationships, products, services, and IS [information systems] environment. Because of the sweeping nature of reengineering, preparation is essential. (Chamberlain, 1993)

[216] Amberg and Zimmermann offer a concise summary of how Groupware, BPR, and WFMS relate to each other:

> BPR pursues the overall objectives to describe, analyze and design organizations and their parts….In contrast, workflow management is an implementation technology that primarily aims the execution of the business and of business processes…In comparison to WFMS, Groupware

WFMS are specifically designed around connectivity strategies for enterprises trying to coordinate their employees and make their collaborative work more efficient through the automation of workflow:[217]

> Workflow Management systems (WFMS) provide computerized support for modeling and executing workflows. For this purpose, workflow relevant knowledge is captured and managed: What is done, how, by whom and with what means. The knowledge of how work is performed serves as the basis for WFMS to enable virtual workplaces: A client must not know where, when, by whom and with what implementation a working unit is performed at a physical workspace. The abstraction of such physical properties helps enterprises to gain more autonomy and flexibility. (Amberg & Zimmermann, 1998, p. 108)

Groupware is a form of collaborative software—also known as computer-supported collaboration (CSC)—that has existed in some form since Douglas Englebart's

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> systems aim at the support of worker groups and teamwork on mostly unstructured (ad hoc) work, whereas WFMS aim at the support of individual workers and ordered (well structured) work processing. In the future the demarcation will become blurred, especially if work processing is done across time and space. Advanced communication technologies enable teamwork across space. (Amberg & Zimmermann, 1998, p. 113)

[217] Founded in 1993, the Workflow Management Coalition (WFMC) acts as a trade and standardization body for WFMS. It has developed and promoted several widely used WFMS standards including XPDL, WfXML, and BPAF. On the importance of WFMS standards, the WFMC states: "Organizations making an investment in workflow software want to be sure that their investment is going to be protected. With standards users can have confidence that essential criteria will be met, hence reducing the risk involved. This clearly becomes of paramount importance when workflow systems are required to interoperate with those of other organizations whenever business processes are conducted across organizational boundaries" (http://www.wfmc.org/wfmc-standards-framework.html).

pioneering work on time-sharing and interface design in the 1960s (Bardini, 2000), though its exact definition did not congeal until the late 1980s. Whereas WFMS focuses on the step-by-step process by which work is divided among connected workers, groupware offers the means to share information and collaborate on the creation of documents (Chaffey, 1998). Groupware thus offers the software that enables the implementation of new workflow processes. The business development of groupware in the 1980s initially centered on the use of email over PC LANs (Borghoff & Schlichter, 2000), various forms of office automation (like peer-to-peer voice and data messaging, or document sharing) stemming from the introduction of smaller desktop microcomputers networked to a central server within a given organization (Hothman, 1994, p. 8-9). Indeed, virtual teams and organizations are created "through the use of groupware" (Grimshaw & Kwok, 1998, p. 50).[218] The basic importance of groupware is to exploit the increased networking of workers through desktop computers to enhance remotely manageable forms of collaboration and communication among them.

Groupware is typically identified with Lotus Notes—a Windows-based software suite launched in 1989 that epitomized how PC computing software could be used to enhance the efficiency and productivity among workers in an information-intensive workplace. Lotus Notes, a still popular groupware brand owned by IBM, has historically offered the following capabilities: email and attachments, computer conferencing, shared

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[218] Hal Richman, president of *Productivity Solutions Inc.* writes, "Virtual organizations are project-focused, collaborative networks uninhibited by time and space. They are without the spatial territory and the cultural norms so important in traditional organizations…Cutting edge technology, like Lotus Notes and DEC Teamlinks, compensate for the absence of traditional workspaces" (quoted in Birchall & Lyons, 1995, p. 19).

databases, application development environment, workflow automation, and document sharing (Hothman, 1994, p. 8-9).[219] With the popular awareness of the Internet that emerged in the mid-1990s, groupware was the subject of intense interest because of the way it promised to re-organize institutions to maximize collaboration, and therefore efficiency in line with the principles of BPR and WFMS (Khoshafian, 1995; Santos, 1995; Bock 1995; Chaffey, 1998; Igbaria, 1998; Beaudoin-Levon, 1999). Groupware was not only an expression of the declining cost of computing power and rising significance of commercial software for business, it was a technological system entailing the reorganization of business processes involving more intensive, though virtual, coordination and management of employees.

Management theorists Watson Fritz et al. (1998) highlight the transformative nature of connecting workers using workflow management systems and groupware where they write that, “Coordination is the process of linking the work activities of employees. Work activities must be linked together in order for individuals to perform productively” (Watson Fritz, et al., 1998, p. 13). Ultimately, according to Ahmed & Simintras (1996), “productive” collaboration is premised on the effective organization of information flows between workers:

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[219] Early in its history, before it was acquired by IBM, Lotus Notes proposed a wireless product, though the technology was too underdeveloped and costly to gain traction in the market (Rooney, 1993). In 2006 Lotus Notes was used by approximately 120 million users around the globe, yet was highly disliked (Arthur, 2006). By 2009, it was used by more than half the Fortune 100 companies, and “80 percent of the largest banks, consumer product, electronics, insurance, pharmaceutical and telecommunications companies” (IBM, 2009) even though it has competition from Microsoft’s Sharepoint and Novell’s Groupwise software suites.

> To begin with, if [business] processes are viewed as systems within which cross-functional flows of resources (information, people, technology) create the transformation, then the transformation process itself can be defined as an ordered set of successive states of material which are being processed from inputs to outputs through the interaction of people, information, technology and so on. …. Interaction indicates the connectivity between otherwise separate activities and is itself characterized by the level of co-operation and sharing involved within each episode of interaction. *We thus see that creating an organization in which activities come together to perform a given task requires synchronization and co-ordinated interaction…*Widespread availability of mechanisms facilitating co-operative interaction plays a significant role in the effective enactment of tasks. (emphasis added, p. 78)

The integration of groupware in order to re-engineer business processes to maximize CCC was, from 1995-2000, widely touted by business managers seeking competitive technological and organizational advantages that were both ubiquitous and invisible (Marshak, 1995, pp. 26-27). As Keen (1995) correctly predicted, the ubiquity of groupware within virtual organizations was accompanied by the promise of wireless email. In 1995, as discussed in chapter 3, two technical problems prevented this innovation: inability to guarantee a continuous connection and limited battery power (p. 94). Anticipating the rise of UC through the BlackBerry, Keen wrote in 1995: “simple e-mail will become the great groupware enabling technology” (p. 93). Inverting the previous norm that users sought the data they needed, in Keen’s mind, “the new culture is that the data follows the user” (p. 92).

Whereas groupware offered the software and technological fix for virtualization, workflow management systems developed the coordination of dispersed, though networked, workers, thereby inscribing the invisible, or virtual, hand of managerial control within an "enterprise workforce." The influence of BPS and WFMS on theories of enterprise management today are reflected in the creation of enterprise content management systems (ECMS) or enterprise-wide systems (EWS). Vanderburg summarizes the influence of BPR and WFMS on the development of enterprise content management systems:

> The flow of information within computers had been carefully optimized, so the problem to be faced had to do with the flow of information outside the computer in the organization. The solution was evident: The organization needed to be reengineered (the term was well chosen) to ensure that the flow of information to and from the computer would be just as rational and optimal as the flow inside it. This shifted the focus away from the functions performed by human beings within the structure of a bureaucracy to the flows of information involved in any process. Computer engineering, in essence, furnished the model for reorganization. The fundamental principle was that data should be captured only once, which meant that all business processes should share their information, thus integrating them into what initially became known as enterprise systems or enterprise-wide systems and later, enterprise resource planning systems. These systems would assemble all of the information required to deliver the products or services, with human beings accomplishing the steps that were not yet automated. (2004, p. 332)

In addition to characterizing BPR as a new form of Taylorism created for intellective workers, Vanderburg's critique of BPR rests on what he calls its emphasis on "technique-based connectedness." This term captures how in contemporary societies *connectedness* itself is technologically mediated and it constitutes a technique implemented to serve broader political economic structures. As such, connectedness is itself a technique in which specific conceptions of and control over work, time, and space are realized. Vanderburg also stresses that this technique-based connectedness has broader implications for society as a whole:

> We are currently building the information infrastructure for the new technique-based connectedness of contemporary societies. Technique-based connectedness refers to the activities of a way of life of a society being primarily connected by means of techniques (Ellul, 1954/1964) and only secondarily by means of experience and culture….
>
> Everything within this technique-based connectedness evolves in relation to everything else for the purpose of increasing individual and collective performance. As a result, the system-like properties of this emerging technique-based connectedness are reinforced. As large organizations help to evolve this new technique-based connectedness, they will have to adapt to it in several important ways. There will be an unprecedented reliance on information at the expense of experience. (Vanderburg, 2004, p. 334)

McNally (2010) likens this process to the "reification of the human process of content creation" (p. 367). He writes, "No more is the work process an exchange of ideas and responsibilities between human agents, but instead it becomes a simple algorithm preprogrammed into a BPM module that is controlled and administered by management and the system administrator" (p. 367). The valorization of CCC as an object of labour management is countered by the intellectual deskilling epitomized by BPR.

Both the growth of groupware and WFMS offered influential models of labour organization and management—models that specifically addressed the dispersion of workers, and the concurrent need to create new ways of managing their activities within increasingly virtual organizations.

6.3 Creating and Managing the Ubiquitous Organization: Growing the Wireless Enterprise

During the same period that the literature on virtualization, BPR, and WFMS were becoming staples of corporate management, the business and technology press speculated about how wireless-networking technologies could help transform both the nature of work and business activities. Most of the early predictions regarding the business application of wireless technologies suggested both the empowerment (or untethering) of workers and the increasing flexibility, indeed ubiquity, of business processes. Wireless connectivity could help reduce infrastructure costs, enhance managerial control, and exploit corporate information resources in a more timely fashion, while also maximizing the flexibility of workers.[220] In terms of the most widely used

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[220] Corporate interest in deploying wireless technologies within firms has been around since the late 1980s (Helliwell, 1989). This early interest rested primarily on the ability of wireless connectivity to cut costs and add flexibility for workers within a specific workplace. Even before the explosive growth of mobile computing devices like PDAs, wireless LANs were pitched as practical solutions to the high cost of cabling

concepts and keywords, the prospective business uses of wireless connectivity mirrored the more abstract rhetoric of virtualization, BPR, and WFMS (Georgakopoulos et al., 1999).

As I described in chapters 3 and 4, the commercialization of wireless data took over fifteen years to reach market and was realized both through the technical achievements of RIM as well as the commitments made by component manufacturers and telecommunications companies. Taken together, the push to commercialize wireless data was advanced using general myths about its perceived utility for the new economy. Despite the best intentions of RIM's leadership, the widespread adoption of its devices and services was by no means certain. While RIM's BlackBerry, and competing PDAs like Palm, claimed to appeal to a mass consumer market, their primary target was in fact corporate executives, managers, professional organizations, and business enterprises. It was this business-focused customer (the so-called "enterprise market") that could afford the relatively high-cost of devices, service fees, and software applications—highly-priced as a means of subsidizing risky investments made, most apparently, by telecommunications companies that had to invest in new infrastructure.

The management literature on virtualization, BPR, and WFMS provided an intellectual base for conceptualizing UC as a strategic management goal, thereby offering CIOs ways of conceptualizing technological and economic change so as to justify

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buildings, for connected "mobile in the building" employees, in creating temporary or consolidated installations, and in the generally "lower cost of maintenance" associated with wireless devices and networks (Goldberg, 1993).

investments in wireless data technologies and services. The keywords and concepts offered by management consultants and the business press enabled (and justified) the actions of these actors as they pursued new IT-centered strategies. With the rollout of packet switched wireless networks like Mobitex and Ardis in the early 1990s (discussed in chapter 3), and the proliferation of BPR and virtualization, attention shifted to the possibility of broadening the scope of wireless technologies to extend the enterprise beyond brick and mortar walls.[221]

There has been a strong link between workflow management and groupware through networking, global area network, wide area network, and local area network developments (Birchall & Lyons, 1995, p. 181). The application of wireless enterprise connectivity was, from an early stage, developed to facilitate the usage of groupware like Lotus Notes. Significantly, RAM Mobile Data's earliest attempts to commercialize the Mobitex network relied on partnerships with Lotus Development Corporation (maker of Lotus Notes) and Novell Inc. (proprietary owner of Word Perfect and Groupwise) (Loudermilk, 1992). As early as 1993, Lotus Development Corporation was interested in

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[221] For example, as early as 1992 Soft-Switch Inc. proposed a wireless enterprise service using the ARDIS wireless data network. The service was initially pitched as a means of increasing the productivity and flexibility of enterprises requiring the management of a spatially dispersed workforce:

> Businesses and government agencies with large field operations will realize the greatest productivity improvements through extension of critical applications beyond the office. Pharmaceutical salespeople, for example, will be able to send orders at their point of origin directly from portable PCs through the enterprise electronic messaging network to a central application for processing. Long distance truckers in the petroleum industry will automatically send in messages containing delivery tickets, and receive dispatch orders. Environmental researchers in remote sites will be able to send in test results, and receive reports and analysis -- all without leaving the location being studied. (Wilson and Hoffman, 1992)

developing a wireless gateway through which it could commercialize wireless applications for its groupware (Rooney, 1993).

With the growing popularity of groupware like Lotus, and in the mid-1990s the success of Palm's PDAs, the anticipated profitability of the wireless enterprise market attracted several large and established technology companies to take part. Ericsson, for example, initially focused primarily on voice services (Solano, 1998). Perhaps the most significant foray into wireless enterprise services was Wireless Knowledge LLC, a joint venture between Microsoft and Qualcomm. Wireless Knowledge was established to offer a full range of business applications including email, scheduling, and sector-specific applications, all routed through a network-operations center located in San Diego. The service was marketed directly to wireless carriers that could offer a suite for enterprise connectivity to mobile workers (Johnston, 1998). In an effort to compete in the growing market for enterprise wireless services, Motorola marketed its GSM-based "Wireless Enterprise" as a "complete wireless-communications strategy for employee off-site mobility, designed specifically for corporate applications" (Anonymous, 1999a). Similarly, Palm's corporate owner, 3Com, launched a joint partnership with Aether Technologies to provide a comprehensive wireless product for the Palm platform enabling "real-time wireless access to mission-critical enterprise data and Internet-based information" (Anonymous, 1999b). Siemens partnered with Omnipoint Technologies to develop wireless enterprise products by allowing workers to access corporate intranets and databases through their cellular handsets and PDAs (Anonymous, 1999d).

An important area in which the wireless services played a key strategic role was in the creation of customer relationship management (CRM) applications (Breece, 1999;

Adrian et al., 1999). The basic principle of CRM revolves around giving both mobile workers and customers access to information available in corporate databases (including billing, scheduling, product, and other logistical information). CRM was widely viewed as a way of making the client enterprise more flexible and adaptive by leveraging detailed information about consumers, market prices, and supplies to create a "customer-centric" business model (Greenberg, 2001). As Breece explains:

> [CRM] tools combine real-time network data with billing and other data and organize it to represent the customer's experience. The output enables customer-adaptive decision making…A key element in the customer-centric business model is transforming customer data into a deeper understanding of customers and their service needs…In this model, raw data transforms into meaningful customer information. This transformation allows you to extract behavioral knowledge about your customers. (Breece, 1999)

In effect, the basic principle of CRM rests on the extension of the enterprise in order to envelope both workers and customers in a blanket of information flows fueled by networked databases, allowing real-time adaptability and responses that are synchronized. This was particularly important for clients focusing on logistics or those offering various forms of "field service" by employees (Goldman, 2000). The centrality of real-time access to customer information for CRM and database marketing strategies further pushed the development of wireless applications for business uses (Adrian et al., 1999; Sharma, 2000).

The adoption of wireless technologies by corporations, combined with literature on virtualization, offered a vision of the "ubiquitous organization" as the final stage of customer relationship management (Kotorov, 2002, p. 225). As business analyst Radoslav Kotorov explained in 2002:

> The emerging ubiquitous organization has two properties: location and time independence; and immediacy. First, location- and time-independent access to services is offered through multiple channels and devices and, second, immediacy is ensured through the design of self-service processes and real-time exceptional request brokerage. The former obscures the organizational physical infrastructure, for a corporation may be reached regardless of its physical location, while the latter masks the operational structure, providing immediate access to its services and specialists…*The evolution of business organization towards ubiquity is a logical process*. (emphasis added, Kotorov, 2002, p. 219)

A management consultant specializing in such technologies, Kotorov's perspective is representative of views held by both corporate executives and management consultants responding to newly available wireless data services in the 2000s. With the expansion of the wireless data market, and an industry focus on the enterprise segment, a number of articles and management texts appeared that touted both the potential for great returns on investments as well as the competitive necessity of the ubiquitous enterprise (Faigen et al., 2002; Sbihli, 2002; Easton, 2002; Wheeler, 2004). Trade journals like *Intelligent Enterprise* wrote articles headlined "The Pervasive Invasion" (Stodder, 2000) citing the UC enabled by these wireless strategies as a defining feature of the next phase of the Internet age. UC allowed workers in the field to synchronize both with corporate databases and workflow management systems, thereby maximizing the strategic value of time-sensitive information. *Software Magazine* featured an article titled "The Business Case for Wireless Applications in the Enterprise." Citing a survey of thirty-five companies, it noted that each had implemented a wireless strategy, incorporating it "into the total business planning process whether the implementation is for SFA [sales force automation], CRM or work force automation" (Gillot, 2002, p. 57).

Within management literature and the business press, myths of UC (Sørensen & Gibson, 2003) became grounded in the development of ICTs-enabled business processes such as BPR, WFMS, and CRM, in part because it was this capability that allowed for the creation of applications for workers and professionals. The appeal of UC was particularly clear for professionals and executives increasingly conceptualized as "knowledge workers." Sørenson and Gibson (2004),[222] management theorists focusing on ubiquitous technologies in business settings, offer the following explanation:

> Modern professionals must, as members of teams in knowledge-intensive organizations, be able to flexibly make decisions, interact with a large number of people and often be highly geographically mobile. They must be able to work fluidly, buy and sell at real-time speeds, advice, approve, inquire, develop relationship, coordinate, collaborate, communicate and problem-solve on a daily basis. The adoption of new technologies, especially the widespread adoption of

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[222] Carsten Sørensen is now a Senior Lecturer in Information Systems at the London School of Economics in the Management Department. David Gibson is a management consultant with Accenture Organisation and Change Management as well as Foresight Consulting (among other firms), and was formerly a manager at Nortel Networks.

mobile phones and networked information systems, has provided these professionals with the ability to work both away from the office and while traveling, transcending both space and time with respect to device and human action respectively.

> Technologies, including desktop video conferencing, mobile phones, collaborative software, PDAs and Internet/Intranet systems, converge to forge the foundation of providing the professional with the tools to respond to the threats of the business environment. This new workplace would be unrestrained by geography, time, and organizational boundaries; and it would be a virtual workplace, where productivity, flexibility, and collaboration will reach unprecedented levels. (Sørensen & Gibson, 2004, pp. 190-191).

In this respect, email is universally seen as the most flexible and primary communication technology in the context of enterprise-wide information systems (Sørensen & Gibson, 2004, p. 192). As such, RIM's BlackBerry was well positioned to capitalize on this specific market:

> The complete reliance on email, coupled with increased demands for flexible and mobile working, can be viewed as key explanations for several professionals voicing great interest in Blackberry technology supporting instant global access to email from small handheld terminals. It represents a simple client technology offering a highly flexible networking service of providing mobile access to email, but based on a highly complex underlying infrastructure. (Sørensen & Gibson, 2003, p. 192)

From a marketing and consumption perspective, what made BlackBerry stand out as a central enterprise device was precisely the way in which it could implement UC as a broad corporate strategy. As explained in chapter 3 and 4, this was due partly to its portability, partly due to its keyboard allowing rapid real time communication, and partly due to its integration with enterprise email systems. Perhaps most importantly, however, it was due to its application of "push-based" communications which made it ready to receive time sensitive information at any time or in any location. As Mike Lazaridis explained, "The Blackberry is a synch engine because it synchronizes data across a mobile work force" (quoted in Sweeny, 2009, p. 73). Moreover, as a complete system, the BlackBerry offered CIOs and other IT managers the ability to monitor the location and activities of their workers, assessing their movement, response time, information flow, and "down time" (Conforti, 2009).

While application development was encouraged (although not at the scale seen in the wake of the iPhone), it was still e-mail and personal information management (PIM) synchronization that provided the most basic selling point. Among IT managers, wireless email was viewed as a core application with a strong majority of CIOs and CTOs by 2001 having implemented or planning to implement wireless email (McAteer, 2001). CIOs were specifically targeted with repeated features in leading trade magazines like *Infoworld* and *CIO Magazine* to prepare for the industry-wide transformation wrought by the development of the *wireless enterprise*. While wireless technology offered CIOs a path to respect and legitimacy within the corporate hierarchy by advocating the importance of managing the flows of information between workers and corporate databases, wireless technology was pitched as a necessity that could quickly penalize late-adopters.[223]

Indeed, RIM focused early on into turning the BlackBerry both into a business necessity and a platform for developing industry or enterprise-specific applications. For example, the emphasis on the programming language Java for its devices allowed the creation of customized software products for business, and industry specific CRM applications (e.g., logistics or finance). The success of Lotus Notes, and other groupware like Microsoft Sharepoint launched in 2001, was a central component of RIM's push into the enterprise market as Lotus Notes and similar Microsoft offerings were integrated into the BlackBerry product line (RIM, 2001).

The evolution of telework literature towards virtualization, and the growing importance of groupware and WFMS, provided a ready climate for the introduction of wireless devices for labour management. Indeed, this is precisely what RIM's BlackBerry Enterprise Server (and related software applications) addressed. Management experts had provided a set of problems; RIM provided the technical fix for the drive to UC. More precisely, new productive *relations* implied a demand for new productive *forces*. Until its

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[223] A typical provocation from an article entitled "Get out of denial: prepare for the wireless enterprise" reads:

> So what are you going to do about it? The answer is to start planning now, knowing that wireless access is entirely out of your hands. It's going to happen, and you're going to be held responsible for how well it works, so you might as well get started. The first thing to do is start learning as much as you can about how wireless access will affect your enterprise. This means you should be one of the first to sign up for whatever services seem viable in your area, and start testing them. Learn what they can and can't do, and where they will and won't work. That way, when your favorite VP comes to you wanting the latest wireless solution, you'll at least know something about it, and you'll be able to offer intelligent suggestions. (Rash, 1999)

introduction, the ideal of UC among teleworkers and/or virtual workers was only an ideal, not a technical reality. The Blackberry enterprise server was one of the first technological systems that directly facilitated the "virtual organization" by wirelessly tethering networked connectivity to the worker (Dewar, 2006; Labrosse, 2008). As it became an early "killer app" for the mobile Internet by, in effect, colonizing the enterprise (Marek, 2002; Harmon, 2000; Freeman, 2009), wireless e-mail, was, also in effect, a "Trojan horse" (Maney, 2001) socializing workers into accepting the "condition of immediacy" (Tomlinson, 2007) enabled by UC.

Regardless of the terminology—telework, networked worker, mobile work, virtual work, and virtual organizations—they all describe the central significance of both UC and CCC to the composition and reproduction of flexible capital structures. In this chapter I have demonstrated this connection through popular management literature that culminated in the development of the wireless enterprise market. This literature suggests that the management of labour in the "ubiquitous enterprise" is more flexibly accomplished but also more totalizing in scope. Ilkka Arminen, professor and researcher at the University of Helsinki, makes a case echoing these issues in the era of UC; "Mobile communication anytime, anywhere, increases social accountability. The revival of 'dead' moments not only gives us extra time, but also makes us open to real-time monitoring and control. Mobile communication etiquette seems to involve the norms of "being always available" and "reciprocating messages/calls you get" (2011, p. 97). This engenders, he continues, "normative pressure for availability [while it] also allows [for] an increase in accountability, a continuing monitoring of communicative parties" (p. 97).

The question of mobile and ubiquitous media making downtime or “dead” moments communicatively productive is an important part of how ubiquitous connectivity enabled through IMDs makes digital labour (waged and unwaged) both more extensive and intensive. The overall effects of UC on labour can be unpredictable, and are often less than desirable for workers (Middleton, 2007; Wajcman & Bittman, 2009). To quote Arminen, “The flexible, mobile coordination may smooth and soften some social affairs, but the shared mobile time-scapes are prone to accelerated, non-stop pressures and increased possibilities for control. The mobile network time may be unpredictable, volatile, chaotic, but not necessarily softer” (2009, p. 98).

Chapter 7 - BlackBerry 2.0: Ubiquitous Connectivity as Lifestyle

"The BlackBerry freed us. It freed me. It freed others that used the product because it allowed us to leave the office, go home, spend time with the family, and not feel stressed out because you might miss an opportunity, or you might not be able to help out at work when there was a problem and people needed your help. So in effect what it did was it allowed you to get something done very quickly. It allowed you to get it done accurately, and get it done within a short period of time. So you can spend more time with your family, more time with your personal pursuits." (Mike Lazaridis, 2008, p. 8)

7 Introduction

In this chapter, I will outline a pivotal transition by which the myth of ubiquitous connectivity (UC), through the BlackBerry, takes on a much broader social existence in part guided by the rise of the prosumer as an archetype associated with the celebration of web 2.0 technologies and services. The layout of the chapter is as follows: I begin with a brief analysis of a watershed in the enthusiasm surrounding web 2.0, taking on *Time* magazine's 2006 person of the year: YOU. I suggest that this is an important popular representation of the myth of UC, symbolically offering a "You-topian" ideal about digital media. This ideal supports, indeed celebrates, the role of prosumption as a form of empowerment and freedom for (largely unpaid) media users and creators. Next I examine, a related shift in the development of the BlackBerry and the myth of UC, broadening the myth to encompass social life itself. The shift here focuses on issues of individual empowerment, emotional satisfaction, and social connectivity specifically that crystallize the popularization of the prosumer around a new generation of BlackBerrys.

7.1 Resurrecting the Prosumer: Web 2.0 and *You-topia*

With O'Reilly's web 2.0 manifesto published in September of 2005 (O'Reilly, 2005), the mythical, technological, and socio-cultural forces contributing to the rise of web 2.0 became widely embraced by media companies, media theorists, and popular culture generally.[224] Arguably, it was at this moment that a renewed (and rebranded) mythology of a network society as emancipatory project became for many in North America a widely accepted characteristic of everyday life—a characteristic that resonated in everyday experience through the use of commonly available technologies. Web 2.0 provided the symbolic resources normalizing and celebrating UC and related technologies as the next step in human progress. Consider that in 2006 several celebratory texts contributing to the intellectual development of web 2.0 were published including Jenkins' *Convergence Culture*, Tapscott and Williams' *Wikinomics*, Benkler's *Wealth of Networks*, and perhaps most emblematic, Toffler's *Revolutionary Wealth*— a follow-up to *The Third Wave* (1980) and a timely rehashing of his concept of the prosumer.

By 2006, Toffler could point to economic and technological developments that had made this emancipatory figure into an everyday reality. For Toffler, the prosumer

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[224] In a 2005 blog post O'Reilly offers this succinct distinction between web 1.0 and web 2.0 media:

> Web 2.0 is the network as platform, spanning all connected devices; web 2.0 applications are those that make the most of the intrinsic advantages of that platform; delivering software as a continually-updated service that gets better the more people use it, consuming and remixing data from multiple source, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an 'architecture of participation,' and going beyond the page metaphor of web 1.0 to deliver rich user experiences. (http://radar.oreilly.com/2005/10/web-20-compact-definition.html)

was more than just a step towards human emancipation: he/she was an economic dynamo essential to the creation of wealth itself. Consider, for example, this excerpt from *Revolutionary Wealth*:

> In *The Third Wave* (1980), we therefore invented the word prosumer for those of us who create goods, services or experiences for our own use or satisfaction, rather than for sale or exchange. When, as individuals or groups, we both produce and consume our own output, we are "prosuming."
>
> Once we take our eyes off the money economy and mute all the econo-babble, we discover surprising things. First, that this prosumer economy is huge; second, that it encompasses some of the most important things we do; and third, that even though it is given little attention by most economists, the $50 trillion money economy they monitor couldn't survive for ten minutes without it…Prosumer output is the subsidy on which the entire money system depends…Prosumers are the unsung heroes of the economy to come. (p. 153)

For Toffler, the prosumer economy is outside of, yet necessary to, the money economy—existing in symbiosis wherein the exploitation of free labour is of marginal consideration. In a section titled "The Coming Prosumer Explosion" he goes on to provide a variety of anecdotes demonstrating how the prosumer contributes freely to the money economy through their own self-fulfilling pursuits, concluding that the development of the world-wide web itself is one such example: "This ever-expanding Internet content results in part from one of the biggest volunteer projects in human history. Prosumers, through their contributions to its structure and content, accelerate innovation in the visible marketplace. They are partly responsible for changes in how, when and where we work, how companies are linked to customers and suppliers and just about every other aspect of the visible economy" (Toffler, 2006, p. 178). From Toffler's perspective, the Internet itself acts as a symbol of the virtues of the unpaid labour of users as well as a mechanism for expanding or redefining the accumulation of wealth with virtually no adverse effects for the labourers themselves.

Later in the text, Toffler distills what he considers to be the twelve most important functions that prosumers carry out *for* the money economy, including "performing unpaid work through 'third jobs' and self-service," "buy capital goods from the money economy," "marketize products, service and skills," "provide valuable free information to for-profit companies," "accelerate innovation," and "raise children and reproduce the labor force" (Toffler, 2006, p. 199-201). What Toffler unwittingly captures here, and what web 2.0 services and technologies make possible (according to proponents), is the mediation of cultural (re)production through ICTs directed to enhance the intellective (i.e., CCC) capacities of prosumers. As evidence of this, consider the centrality of the prosumer in Tapscott and Williams' influential and popular business manifesto called *Wikinomics*.[225]

Alongside the flood of intellectual and popular treatise fueling the web 2.0 euphoria, 2006 offered a number of important technological and commercial milestones.

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[225] *Wikinomics* is now in its third edition and spawned a sequel entitled *MacroWikinomics* (2010). Both Tapscott and Williams are highly sought speakers and consultants for both corporations and governments. Their appropriation of the prosumer is now widely integrated across a variety of global organizations, both public and private (see Tapscott & Williams, 2010).

It marked the year Google purchased YouTube for $1.65 billion USD and it was the year MySpace, one of the first major social networking site, reached 100 million users. Furthermore, 2006 was the year Twitter was founded; the year LinkedIn reached profitability; the year Facebook officially opened to the public (abandoning its requirements that users have some institutional affiliation); and it was also the year in which the three primary mobile advertising platforms—Quattro Wireless, Admob, and Millennial Media—were launched. As I will discuss later in this chapter, 2006 was the year that BlackBerry released its first truly global, consumer-based line of smartphones, marketed as lifestyle devices suited to the new web 2.0 era. It is also no coincidence that Apple unveiled the first iteration of the iPhone in January of 2007.

The period 2005-2007 marked the convergence of intellectual treatise, popular myths, and consumer technologies. While each of these components has important historical antecedents—for example, Toffler's prosumer was coined in 1980, the Internet was popularized in the middle of the 1990s, Apple and Palm offered personalized and portable devices in the early 1990s—these were updated and reconfigured during these three years, weaved together amidst the popularization of web 2.0 rhetoric and articulated in the development of new personalized devices and services. Indeed, the myth of UC was implicit in this process as the freedom and empowerment associated with web 2.0 and prosumption entailed an expansion of new points and possibilities for connectivity (entailing, of course, new products and services).

There is perhaps no better example of this techno-euphoric mood than *Time* magazine's 2006 person of the year: YOU. While it did serve to briefly boost sagging magazine sales (Ives, 2006; Granatstein & Moses, 2006), it also concisely illustrates how web 2.0 and UC converge from the perspective of “old media” (Time Warner) seeking to cash-in on the hype. Interestingly, the resulting issue serves almost as an ironic effigy for traditional mass media, now written off as both undemocratic and unnecessary by *Time’*s own editorial staff. Sadly, this irony seems to have been lost on them as the opening lines of the issue demonstrate:

> The ‘Great Man’ theory of history is usually attributed to the Scottish philosopher Thomas Carlyle, who wrote that ‘the history of the world is but the biography of great men.’ He believed that it is the few, the powerful and the famous who shape our collective destiny as a species. That theory took a serious beating this year. (Stengel, 2006, p. 9)

So began *Time* magazine's 2006 “Person of the Year” issue—which, to repeat, appointed (or anointed) “You” the “Person of the Year.” “Yes, you. You control the Information Age,” *Time* exclaimed. This singular message was re-phrased and reiterated throughout the issue as a way of celebrating the triumph of web 2.0 technologies and entrepreneurs over the economy and culture. In the feature article, Lev Grossman declares that 2006 was “about the many wresting power from the few and helping one another for nothing and how that will not only change the world, but change the way the world changes” (p.16). The narrative outlined by *Time* suggested that humanity has been freed from entrenched political-economic authority, hierarchy and oppression—as a “new digital democracy” has arrived (while, presumably, undermining the influence of mainstream media companies like owner and media conglomerate Time-Warner). According to this depiction, web 2.0 Internet tools have empowered individuals over the forces of history.

Time's editor, Richard Stengel writes that "individuals are changing the nature of the information age"— "they are the engaged citizens of a new digital democracy." "The creators and consumers of user-generated content are transforming art and politics and commerce," he suggests. This rhetoric is conflated with more democratic and populist strands of American history, which Stengel characterizes as a tradition of "amateur politicians." "Thomas Paine," he declares, "was in effect the first blogger, and Ben Franklin was essentially loading his persona into the MySpace of the 18th century, Poor Richard's Almanack." As he draws these comparisons with aspects of the American Revolution, Stengel claims that YouTube and other web 2.0 technologies are overturning dominant power structures. "The new media age," he declares, "is threatening only if you believe that an excess of democracy is the road to [chaos]. I don't" (2006, p. 9).

In keeping with such rhetoric, the cover features the trademark YouTube video interface framing a Mylar mirror acting as the monitor of an iMac desktop computer. These are important visual cues as to the content of the issue as they stress the (commercially and technologically-enabled) importance of "You." "We chose to put a mirror on the cover," the editor explained, "because it literally reflects the idea that you, not we, are transforming the information age" (2006, p. 9). Statements like this one frame the "web 2.0 era" as an unrivaled wellspring of individual liberation and autonomy.

The "end of" myths associating technological progress with some final state of human emancipation conceals a fundamental tension between technological change and the political economic structures of capitalism. As Vincent Mosco writes, "we need to understand political economic pressures within the cultural context of meaningful myths that lift us out of the day-to-day and designate us as a special, perhaps even a chosen, people" (Mosco, 2004, p. 118). Specifically, "It is only when we see cyberspace as mutually constituted out of a culture that creates meaning and a political economy that empowers it that we can fully understand why it is that over and over again, people have encountered and believed in a genuinely living end" (p. 118).

Time's version of a digital democracy—its "You-topia"—is built from the "work" that masses of "Yous" perform—invoking, symbolically, the rhetoric of the prosumer and prosumption. Lev Grossman writes, "And we didn't just watch, we also worked. Like crazy. We made Facebook profiles and Second Life avatars and reviewed books at Amazon and recorded podcasts. We blogged about our candidates losing and wrote songs about getting dumped. We camcorded bombing runs and built open-source software" (Grossman, 2006). Nowhere in this litany of activities are the identities or political economic contexts of the agents at issue. Like other myths that occlude their political economic precepts, *Time* ignores the fact that individuals are in any way connected to a broader material world beset by class, nationality, ethnic, and gender inequalities, often creating insurmountable barriers to full participation. These inequalities are summarized by the term "digital divide" (Norris, 2000). Instead, Grossman forwards the idea that everyone has the ability to contribute something substantive to *Time's* version of an online digital democracy.

Finally, no triumphal myth would be complete without some token heroes. *Time* focuses on the creators of YouTube whose rags to riches story epitomizes the entrepreneurial opportunities made available by fusing the concepts of democracy and technology with the *free* market. Like many of the success stories emerging from Silicon Valley, this one presents the neoliberal view that "technological change relies upon the coercive powers of competition to drive the search for new products, new production methods, and new organizational forms" (Harvey, 2005, p. 68). The story is particularly appropriate as the purchase of YouTube by Google (for, to repeat, $1.65 billion USD in 2006) was yet another step in an acquisition frenzy that saw corporations buy social networks in their quest to develop online advertisement revenue streams (News Corporation's ultimately ill fated acquisition of MySpace for $600 million in 2005 was a notable precursor).

The tacit claim here is that private control of the means of communication, in the form of vertically and horizontally integrated corporations—whether it be Apple, Google, Time Warner, or even RIM—leads to both market efficiency and technological innovation and these, in turn, ultimately yield greater freedom and democracy. The democratizing impulse said to adhere in web 2.0 stands in stark contrast to unprecedented levels of media concentration (Noam, 2009; Winseck & Jin, 2011; Wu, 2010). It is therefore in the interest of media capital to propagate myths that enable commercial technologies to increasingly mediate society's communicative capacities—a process now defining the development of IMDs as they become the primary Internet access point for users around the world (Smith, 2011; Wright, 2008). According to these myths, it is through the market that needs are most effectively registered and efficiently organized—that is, it is through the mediation of atomic-vested interests that collective good is attained; creating a high-tech version of Adam Smith's invisible hand perpetually summoned (and regularly caricatured) by free market economists (Friedman, 2007; Hayek et al., 1956; Von Mises, 1977).

Despite the rhetoric about individual freedom and economic prosperity, the era of UC entails greater competition by commercial media organizations for our attention. In so doing, commercial forces seek greater existential inseparability between users and commercial interests by assuming the role of key mediators in everyday life, particularly in their shaping of our sense of self and the norms of our social relations. Though such influence competes with many other powerful and important mediators—like the family, workplace, religion, and nation state—the commercial strategy is to colonize every aspect of daily existence. One of the most effective ways commercial interests have done this is through the dissemination of consumer technologies that have become communicative and cultural staples of everyday life. Thus the era of UC and IMDs offer up an ideal vehicle for the perhaps final and totalizing, process of colonization. So while communication is more ubiquitous it is also more highly concentrated by corporate power; while contemporary media appears more social, in fact the devices themselves are more personal and private, thereby making obsolete policies of universal access and considerations of communication as a public good. As substitution, we are left with the figure of the prosumer as a popular, yet thinly veiled, expression of the *sovereign consumer* (see Babe, 2006b, pp. 47-50; Manzerolle & Smeltzer, 2011).

7.2 BlackBerry 2.0

As I will outline in the remainder of this chapter, the popularization of web 2.0 also framed a particularly important transformation for the BlackBerry brand of devices and services. What began largely as a narrative shift in the identity of the Internet became a key part of RIM's brand messaging and product offerings embracing the prosumer as its ideal user. RIM's strategy involved re-conceptualizing UC—through its devices, services, marketing, and investor relations—into a fully connected lifestyle adapted to the new era of empowerment and freedom described by web 2.0 proponents. A central component of RIM's strategy involved positioning its brand in experiential terms to demonstrate the benefits, and indeed the necessity, of a fully connected lifestyle. RIM's specific goal was to generalize the significance of UC for all as a means of embracing and articulating the archetype of the prosumer (Hamblen, 2008).

To accomplish this, RIM began leveraging the iconic aspects of the BlackBerry's brand identity—captured by its first slogan "always on, always connected"—into a far-reaching message about a radically new social milieu accessible through its devices and services. Yet RIM was engaged in not only appealing to an expanded audience of potential BlackBerry users, but also in transforming its existing users into a targeted audience to which it could sell apps, advertisements, and other products. To do this, RIM developed a new marketing strategy and new consumer-friendly products that tied its identity to the most important elements of web 2.0. Always on, always connected became as much a social necessity for the web 2.0 prosumers as it was a business necessity for the virtual organization.

The intertwining of business and social necessity was a theme reiterated in a number of interviews with marketers and designers at RIM who repeatedly stressed that the BlackBerry no longer had a specific user type, but rather that it served a lifestyle in which virtually everyone was implicated. Consequently, RIM's plea to consumers was precisely a valorization of both ubiquity and immediacy as *the* dominant forms of social mediation. RIM's corporate narrative became one in which everyone and everything was to be made available everywhere and always. While this narrative resonated with the wireless enterprise market for the reasons discussed in chapter 6, the voluntary adoption of this far-reaching media condition by consumers was specifically related to both technical advancements as well as the popular myths about the necessity of UC in web 2.0. RIM hoped to communicate the belief that through the BlackBerry anyone could participate in this new lifestyle. In contrast to the bulk purchasing made by corporations (guided by their CIOs) seeking ever more efficient and productive ways of managing connected workers, the pitch to consumers rested on a narrative of "empowering" individual users in and over their social lives. In so doing, RIM was appealing to the You-topia consolidating around web 2.0. Indeed, web 2.0's valorization of the prosumer provided a ready template within which the BlackBerry could be re-cast.

To be sure, marketing to individual consumers was not entirely new for RIM; as described in chapter 4, individual users, particularly celebrities, high-profile entrepreneurs, politicians, corporate executives, and professionals like lawyers and stock traders were important to the early successes of the BlackBerry brand. What was new, however, was a broad strategy that connected the evolution of the BlackBerry brand with the changing nature of social mediation in everyday life in light of the growing importance of UC in both work and socialization. Consequently, the BlackBerry was to act as a general-purpose lifestyle device suited to this new world of social connectedness. While the BlackBerry may have altered the relations of production within enterprise and professional workforces in important ways, RIM's new strategy reflected how social networks (both online and offline) were ubiquitously mediated by technology.

To illustrate how web 2.0 influenced the evolution of the BlackBerry, and with it, the development and commercialization of UC, the remainder of this chapter is divided into four sections. The first examines the positioning of the BlackBerry in terms of a connected lifestyle focusing on the experiential and affective qualities of UC. The second outlines the marketing of new devices in which the prosumer was framed as a typical/ideal BlackBerry user. The third section looks at the specific incorporation of social media networks like Facebook and MySpace into the design and marketing of the BlackBerry. Fourth, it looks at the creation of the BlackBerry as a branded community and as a platform for creating targeted audiences of consumers for new products and services.

7.3 BlackBerry as Experience

At the height of the web 2.0 euphoria in 2006 RIM introduced what would become a multi-pronged strategy focusing on the affective qualities of the "BlackBerry experience." This new focus offered an evolved brand narrative bridging work and social life, new devices developed expressly for web 2.0 prosumers (including added or enhanced media functions), and an emphasis on social networking as a core capability. While appeals to business users focused primarily on access to time-sensitive email, beginning in 2006 a new narrative stressed the affective dimensions of UC: "Love what you do," "Take life with you," "Master your everyday," "Life on BlackBerry." The theme of "love" and "everyday life" are repeatedly deployed in RIM's marketing and advertising beginning at this time. On the scope of RIM's affective turn, McGuigan (2010) writes, Most striking about this campaign is its attempt to mobilize *affect*. The images characterize BlackBerry devices as an archive and conduit of ‘everything we love in life’. Ironically, the images remind us that what we really value – what gives meaning to our lives – are interactions with the *people* we love and care about. Perhaps this is meant to tap into guilt experienced by people forced to spend time apart from their families – as is common in the corporate world. In this sense, the products and their connective capabilities are reified, serving as proxies or facilitators for interactions that cannot occur in physical proximity, for whatever reason(s). (McGuigan, 2010, p. 20)

Figure 18: A typical ad for the BlackBerry Curve, highlighting both the emotional dimensions of UC, but also the native integration of web 2.0 apps like MySpace, Facebook, and Twitter (RIM, 2008). [226]

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[226] The caption reads:

> Meet the new BlackBerry Curve 8520 smartphone. How can you not love hanging out? Hanging out is for inside jokes, secrets, updates, BBM flirting and doing things you'll reminisce about the next time you hang out. We thought hey, even if you can't be in the same room, coffee shop or time zone, you can get together on Facebook, Twitter, BlackBerry Messenger or MySpace. That's why we loved building the new BlackBerry Curve. Just because you're not together, doesn't mean you can't hang out.

Figure 19: Print ad for BlackBerry featuring the "Love what you do" slogan. The image and text reinforces the experiential and affective dimensions of the brand (RIM, 2009).[227]

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[227] The caption reads:

> LIKE is watered-down love. Like is mediocre. Like is the wishy-washy emotion of the content. Athletes don't do it for the like of a sport. Artists don't suffer for the like of art. There is no I like NY T-shirt. And Romeo didn't just like Juliet. Love. Now that's powerful stuff. Love changes things. Upsets things. Love is at the root of everything good that has ever happened and will never happen.

Figure 20: Web ad used on the New York Times website (www.nytimes.com). Text emphasizes the integration of business and personal uses (RIM, 2008).

Figure 21: Still from interactive web ad featured on the New York Times website (www.nytimes.com) (RIM, 2009).

Figure 22: Web ad via Linkstrom.com (RIM, 2010).

This broadened narrative shift was also communicated to investors and business analysts in RIM's annual reports, and these constituted what is perhaps the most concise expression of the BlackBerry's expanded brand identity. For purposes of contrast, consider these relatively bland opening lines from the 2006 Annual Report (fiscal 2005), the year before the aforementioned transformation:

> **A world of Information**
>
> The flagship product of Research In Motion Limited, BlackBerry is a leading wireless connectivity solution, providing access to a wide range of applications on a variety of wireless devices around the world. It combines award winning devices, software and services to keep mobile professionals globally connected to the people, data and resources that drive their day. (RIM, 2006)

These lines are highly descriptive, factual, and explain clearly the "value proposition" for potential users and customers looking to implement RIM's devices and services as tools of productivity. The BlackBerry is described primarily as a practical wireless business "solution."

The 2007 annual report, however, opens with these telling lines:

> Wireless access to email and other information is no longer a luxury reserved for top executives. People everywhere are leading increasingly unwired lifestyles, dynamically balancing careers and rich personal lives. *They need to be able to go where life takes them without losing touch with the people and information that matter most. They need a mobility solution that can blend innovation, usability*

> *and style…Wireless connectivity is liberating and people who live busy lives want that freedom*. (emphasis added, RIM, 2007)

Extending the lifestyle narrative, the 2008 annual report emphasizes UC as a primary selling point to consumers, opening the report with the promise of connecting you to "everything you love in life" (RIM, 2009, p. 2) including social networks, entertainment, and leisure activities. The 2009 report goes on to innumerate the various ways the BlackBerry has intervened in everyday life as a necessity, delivering a crucial message to potential consumers and investors alike: RIM is not just about business users, but instead is about a radically new way of life premised on UC in which work life and social life are seamlessly interwoven. This is a particularly important component of the BlackBerry's new expanded identity as it attempts to overcome the potential work-related stigma typically associated with the brand. The 2009 report detailed sections outlining the lifestyle characteristics of the new devices and features, proclaiming that the BlackBerry would "connect to your favorite entertainment,"[228] "connect to your social networks,"[229] and "connect to your interests."[230]

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[228] Content under heading:

> "Your BlackBerry smartphone puts powerful audio, video and gaming capabilities at your fingertips. Listen to music or watch videos whenever you wish. Play mobile games when you have time on your hands. Take photos or shoot videos of friends. And use built-in GPS to ensure that you find that shop, restaurant or dinner party. Purchase a novel, order flowers, reserve concert tickets and book your next trip – all on your BlackBerry smartphone." (RIM, 2009)

[229] Content under heading:

> Keep tabs on your social circles. Share recent baby photos and make sure friends see your vacation video clips. Wish Uncle Stu "Happy Birthday," instant message Sophie about lunch, email the mechanic or call Grandma just to say hello. Stay linked to the office while in the field or traveling, send important files to your co-workers and edit documents on the spot. Plan a night out with the girls or a poker game with the guys. Connecting to your social networks has never been

For investors and consumers alike, RIM positioned the BlackBerry as an indispensable part of everyday life—a service significant not only for work but also for maintaining (if not enhancing) relationships with friends and families. Additionally, RIM pushed for the BlackBerry to be recognized as a device for consuming entertainment media. In sync with web 2.0, the overarching narrative was one of empowerment, of productive creativity, and of connectivity as freedom itself.

It is important to note that this marketing focus on the experiential and affective dimensions of the BlackBerry also fits a more general industry shift away from selling devices (products with relatively low profit margins) to selling services.[231] In this case, BlackBerry is offering its own branded connectivity, delivered through the handset, in

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> easier. (RIM, 2009)

[230] Content under heading:

> Catch up on the latest news while waiting for your flight. Review last night's sports scores. Review your stock portfolio's performance. Find a great bistro for next Thursday's business lunch. Check the weather before heading to the soccer game. Investigate the registry for gift ideas and get directions to the wedding. Make sure tomorrow's meeting is still on and review the big presentation. Connecting to all of your important information while on the go has never been easier. (RIM, 2009)

[231] From the earliest days, the commercial development of UC has been framed by the goal of selling services, not devices. From a 1993 *Forbes* article on wireless data:

> The real pot of gold in [wireless] is not in selling the devices, but in selling communication and information services to be consumed by those devices," according to Bill Ablondi, principal analyst for IS Strategic Decisions, in Norwell, Mass. Ablondi estimates that 7.7 million wireless devices will be running in the U.S. by the end of the decade. This would be a $1.6 billion hardware market, but it would be accompanied by $4.4 billion in annual network services. It's the knowledge workers who will be paying for all these services, simply because they are there. (Cringley, 1993)

order to expand the profitability of its services. Thus the emphasis on “everyday life” is crucial in this regard because it massively increases the range of services that can be offered through RIM’s network. The goal was to expand the usability/applicability of the BlackBerry beyond the, albeit increasingly fluid, boundaries of the working day. RIM was seeking an audience with more than just CIOs; instead, RIM wanted to connect with everyday consumers, albeit those willing to pay for a premium device.[232]

The focus on experiential and affective qualities is an essential part of contemporary marketing and advertising (Arvidsson, 2006) and has been a historically important part of wireless telecommunications marketing (Goggin, 2006). Focus on experience is arguably more important for wireless services in part because the key medium, the electro-magnetic spectrum, is itself experientially intangible. Branding mobile phones and devices as tools of everyday life requires a heavy dose of affect. As a basic human need, social connectedness is re-routed through personalized IMDs that allow us perpetual access to our specific network of friends and family. As Adam Arvidsson writes, “In the case of mobile phones, branding means first of all, the inclusion of customer’s everyday life” and in so doing “to construct various forms of branded communities” (Arvidsson, 2006, pp. 116, 118). The development of branded

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[232] This shift also reflected the growing “bring your own device” (BYOD) trend in many workplaces, spurred by the rapid adoption of both iPhone and Android IMDs (Rockel, 2012). In this trend, consumers pay for devices themselves, though they are required to synchronize them with their workplace’s IT department in order to gain access to secure email and other sensitive information. For employers, this shift was mixed in part because on the one hand it offloaded handset costs onto workers, but it also required new solutions to make sure these new devices met the security standards once only available through a total system like the BES. RIM has been attempting to keep a foothold by offering secure virtualization services that route BYOD devices through their secure servers. The service is called “Mobile Fusion.” Similarly, RIM has developed software that creates easy partitions on devices (both BlackBerry and BYOD) that separate work functions from social functions (Albanesius, 2012).

communities has important implications for the long-term development of wireless services in relation to the mediation of social life itself. Thus the emotional dimension of marketing communication devices and services shifts within the mobile market towards the provision of software, services, and content—rather than hardware—as the most significant revenue source (this relates to issues raised in chapter 3 regarding the shift away from hardware manufacturing). What is on offer is a service that provides us ubiquitous access to our social lives, positioning it as a basic necessity akin to food and shelter. There is also a political economic necessity for the wireless industry itself; "As a source of revenue thus shifts from network and call charges to the provision of services and 'content,' the brand also comes to function for investors as a direct indicator of potential future Customer Lifetime Value" (Arvidsson, 2006, p. 116).[233]

With this point in mind, RIM's emphasis on the BlackBerry as a lifestyle necessity refocuses the brand not simply as a specific device but towards the entire BlackBerry brand as an essential service. For RIM, the BlackBerry brand becomes a locus for emotional and affective labour associated with social connectivity. Consequently, the participation (prosumption) of users—particularly younger consumers—becomes a means of adding value to the brand itself as a function of the *network effects* (Benkler, 2006)—or perhaps network "affects"—that see the value increase as more people are added to such communities. The more users that are committed to the connectivity offered by BlackBerry, the greater its social and economic

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[233] Customer lifetime value (CLV) is an important part of corporate customer relationship management (CRM). It represents "the present value of all future profits obtained from a customer over his or her life of relationship with a firm" (Gupta et al., 2006, p. 141). CLV is particularly important for companies providing services, in this case wireless connectivity.

value. In this regard, the attraction of younger consumers becomes essential. As one marketer I interviewed explained, "the youth market fuels the coolness of the brand." Indeed, it is this affective component ("coolness") that is ultimately so important to the production of the mobile audience for BlackBerry. As people spend more time using their devices(s), the potential mobile audience becomes more valuable and, as a result, the BlackBerry brand becomes more valuable also.[234]

What these sample transformations illustrate is how the idea of ubiquitous connectivity has been redefined through the BlackBerry brand in an effort to create and reflect a branded experience of mobility, identity, and sociality. As an interview with the head of RIM's User Experience Research department revealed, the development of the BlackBerry platform in the post-web 2.0 period was precisely about cultivating affective

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[234] In an effort to expand both its potential audience and the affective dimensions of the brand, RIM sought out high profile endorsements from major stars and musicians, the biggest was a partnership with the band U2 that saw extensive marketing campaigns linking one of the biggest rock bands in the world and their love of BlackBerry to new product rollouts. This endorsement was particularly significant because U2 dropped its longstanding relationship with Apple in favour of BlackBerry (Spence, 2009). U2's 2009 360degree tour was sponsored exclusively by BlackBerry, reaching an estimated 7.2 million concert attendees (Reuters, 2009; Waddell, 2011). Later that year U2 released an exclusive "mobile album" available through the BlackBerry website (Zeis, 2009). These and other partnerships with musicians and celebrities for example, rapper Jermain Dupri and DJ Diplo) have focused on enriching the "coolness" factor in order to overcome the traditional identity of the BlackBerry in the youth market. The emphasis on music to enhance the coolness of mobile technologies has been well documented (Wang, 2005; Goggin, 2006) and it is therefore not surprising that RIM has turned to music celebrities to enrich the coolness factor, but also to position the BlackBerry as an important platform for music consumption itself (most recently evidenced by its BBM music service, released in 2011). RIM also began sponsoring fashion shows, concerts, and other cultural events in order to raise brand awareness among those outside of the business enterprise market (Guth & Vascellaro, 2007). More recently, this logic was expressed in RIM's choice of Alicia Keys as their "Global Creative Director," as well as sponsoring her world tour, in conjunction with the launch of their BB 10 line of devices (Lederman, 2013). Additionally, RIM (now known simply as BlackBerry) employed a variety of celebrities in their "Keep Moving" initiatives, which featured these celebrities (including director Robert Rodriguez and author Neil Gaiman) using the BB 10 platform to compose and create various media projects. See http://keepmoving.blackberry.com/desktop/en/us/home.html

and experiential attachments to the devices in ways that made the BlackBerry's social networking function "stickier" or more closely integrated across moments in everyday life. He describes the recent evolution of the device as being a negotiation between satisfying common needs and efforts to create a "hot" product that mobilizes the sublime and affective connections between the user, their device, and social setting:

> For me, the distinction between business user and general consumer never really existed. Two thoughts: first, there's been a natural trajectory from the smartphone as a tool to a necessity of everyday life. We're seeing the natural progression into the consumer market; second, my philosophy is always that you're not a businessman or a consumer, you're a human. At the end of the day even if you're 60 years old, you probably have some social interaction or personal hobby, that's not business, even though you're a business person. Even if you're a 20 something, you're probably going to load this up with movies or media, on your way to your first job. The lines are blurring, there are interesting places where you will have differentiation, like in industrial design, things like colors and aesthetics, but these are superficial. We think about the device as satisfying needs, not as a specific demographic, or consumer segment.
>
> Over and above those needs, consumers want a hot device, they don't want a bland device, they want something that feels good in their hand, something had makes them feel good; they want a hot device. You pick up the device you should be able to rock and roll. There's a certain level of efficiency around messaging, predictable, reliable, on time, certain element of that that is baseline, regardless if you are a business or a girl who sends hundreds/thousands of texts.

> But at the end of the day it's the emotional connection with the device that makes people want to have it, use it. (personal communication, February 9, 2011)

This focus on affective and experiential dimensions involved more than just new marketing slogans and advertising images. Rather, he describes his experience in creating tools and techniques for measuring affective responses to a variety of stimuli (tactile, visual, iconographic), and then using those measurements to guide research and device design. Emotional responses were incorporated as a central design principle for the BlackBerry:

> I have a long history of looking at products from the perspective of emotion. It started with a project to measure fun at Microsoft. It started off as an academic activity, but was something that had to be applied to a practical setting. So we set off on that, then it grew into assessing things like iconography and aesthetics. I talk a lot about what bubbles to the top—top of mind—I rail against Likert scales. I wanted to find a way to get out of participants what they would say at the water cooler. So we started working on methodologies that would elicit their visceral response. Why did it make you feel that way, using words and then attach that to the product. You've grabbed the visceral off the top and bring it back to the product. We did facial analysis focusing on the Zygomatic muscle; so what are the qualities in software that cause that kind of muscular activity. Emotion is not just the obvious. Yet a certain set of people with iPhone think that's awesome, and it will wear off, once the party is over. So what are the little things that will keep the pleasure going? And the people that never get excited, what are the things that bring them a connection? That's what we're interested in.

> From a design perspective, it’s a challenge. How do you get the devices to feel natural? We get analyses of people doing it in different ways, but it’s about the need, and how do we design it to be intuitive and natural, to anticipate the things that people can’t articulate. How do you just get it to just make sense? (personal communication, February 9, 2011)

The process of building this emotional experience also reconfigured the institutional components within RIM surrounding research, design, and engineering. As an employee at RIM’s user experience division stated:

> You need to build an experience around it. That’s what the user experience is about. It’s about building an emotional experience around something. You have to create a story about the object. User Design process: UX research activity and designers are partners through the process, designers are part of the research stage, and researchers are part of the design process.
>
> One element was the universal search function. Instead of bringing up a dedicated search tab, or app, it is built right into the OS so that you can just start typing right away. They had people keep a diary about what they were doing with the BlackBerry, about absolutely everything you search for on any device, and every tool that you use. They look at search as a holistic thing, what are the elements of design that we can take from the real world and inject into the design. Search has got to be front and centre, people don’t want to search and then commit, it brings back everything as you type in real time with a list of everything that starts with a letter, then adding another letter. Next, what is the most

> important thing first? Need to design an ordering of importance that lists things in order of importance.
>
> Screen interface is becoming more aesthetic and experiential, it is an interactive experience that can be customized for the user. What do we want to achieve in redesigning the aesthetic? We need to craft our own identity, not through emulation, but something that feels and is experienced like a BlackBerry, if we didn't go for this unique aesthetic and brand messaging we were going to lose.
>
> Make the tabs/icon have chrome, or chrome highlights, no chrome etc… how do we figure out what are the elements we need to craft an aesthetic? Took two designs and flashed them in alternating pattern for an audience, fast enough that they couldn't really reflect on which they liked, but try to determine which one had an effect on them at an impulsive level, emotional level. We did 100 something comparisons, and after going through these you get a picture of what people want from a BlackBerry experience at an emotional level. (personal communication, February 9, 2011)

These considerations regarding creating the BlackBerry *experience* was a large part of the redesigned BlackBerry OS 6 released in 2010. OS 6 was the first operating system released from RIM's integrated User Experience research department, launched specifically to evoke the experiential qualities alluded to earlier. Among its features were more lush graphics, icons with chrome highlights and shadows, giving the icons the appearance of three-dimensionality, a universal search for intuitive usage and access to information and services. In conjunction with the release of OS 6 RIM also released its hybrid device called the BlackBerry Torch, a device that featured both a physical keyboard and touch screen as a slider (Baig, 2010). It was the first device designed entirely under the new emphasis on user experience as a defining and unifying strategy. OS 6.0 constituted a key moment for implementing a new "experiential," "immersive," and "sticky" experience around the BlackBerry device.

While the practical use value elements of the BlackBerry had long been a defining component of its symbolic appreciation in the public eye, it was now crucial to turn BlackBerry into an experience in and of itself: a unique way to package ubiquitous connectivity and link it emotionally to a specific device and user experience.

7.4 New Devices

"One of the things we found was that the closer that these devices get to you physically, if it's something that you wear, like a watch or something you put in your pocket or hold in your hand, it takes on a whole different meaning. It becomes something that becomes a part of you. It reflects your character, your personality, and you take certain attributes from that device. There's a status involved. So what we found was that there's going to be a large amount of customization going forward. There are going to be different styles, different models." (Mike Lazaridis, 2008, p. 12)

The BlackBerry Pearl was RIM's most concerted attempt to cultivate a large-scale prosumer market through the development and sale of a new device. While it was preceded by the release of the 7100 in 2004 (the first candy bar shaped BlackBerry), the Pearl differed in its direct appeal to consumers. The Pearl was available in multiple colors and included a high quality glossy plastic casing. It featured smooth, rounded lines, rather than the bland and bulky enclosures of previous BlackBerrys. The Pearl offered GSM and GPSR/EDGE [2.5G] connectivity that allowed it to access wireless data and the Internet access on most national and international networks.[235]

Aside from the aesthetics of the device's outer design, it also featured a crucial upgrade to its thumb-based navigation—while the Pearl incorporated the compressed keyboard of the 7100 with RIM's patented SureType algorithm (an algorithm that learned to anticipate typed words before they were completed)—the Pearl offered something new: a scroll ball positioned in the middle of the device between the screen and keyboard. This new feature provided a clear link to the name of the device as it lit up and glowed white. Replacing the right-side scroll wheel of previous BlackBerrys (favouring the right-handed), the scroll ball was meant to emphasize fluid new ways to navigate the BlackBerry OS by emulating the function of a mouse on a desktop PC. This new thumb based interface enabled more dynamic interaction with social networks, websites, and applications in line with the expanding uses of IMDs for more than just communication (Austen, 2007). The scroll ball was positioned on the device, squarely in the middle, to reflect the increasing use and portability of such devices, particularly as they are held with one hand, rather than two, as most previous BlackBerrys had been.[236]

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[235] The Pearl was also designed as a multi-media device, enabling the user an expanded range of content production. The Pearl offered several upgrades in screen resolution (240 x 260 pixels), processing power, and multi-media features, consonant with the new expectations of a prosumer market spurred on to unleash their creativity through these devices. A 1.3 megapixel camera, Bluetooth connectivity, voice dialing, music and movie playback, flash memory card slot, and came with several instant messaging and social networking features (AOL, Yahoo, MSN, ICQ) built directly into the device (RIM, 2007b).

[236] On this note the press release for the Pearl reads:

> Images appear incredibly vivid and crisp on the BlackBerry Pearl's large, ultra-bright, high-resolution (240x260) display. Built-in light sensing technology automatically adjusts the screen

The Pearl was constructed and marketed as an object of fashion, much like Nokia's popular mid-1990s offerings (2100, 8200, 8800) that redefined cell phones for a mass consumer market (Goggin, 2006, p. 47). Nokia's products targeted younger consumers in the late 1990s and, in properly Sloanist fashion, offered different colors and changeable faceplates to personalize devices (p. 46).[237] Indeed, Nokia's strategy provided an important template for RIM's own expanded ambitions. *Wall Street Journal* technology reviewer Walt Mossberg described it as "All shiny black and silver, the slender Pearl looks more like a fashion phone than a keyboard-equipped smartphone" (Mossberg, 2006). The Pearl was meant to be seen in social settings, and be an object of conversation. In this regard, the Pearl offered RIM an opportunity to attract younger consumers and thus it contributed a crucial component of RIM's new strategy (Goggin, 2006, p. 47). As a RIM marketer explained in an interview, younger consumers are essential for the BlackBerry brand in part because they tend to be more brand aware and, as a result, brand loyal. Similarly, younger consumers are more prone to demonstrate and share their devices with friends and to talk about the brand in social settings. A fashionable, cutting-edge device is an important status symbol. It also fits into the

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> and keypad brightness for optimum viewing of emails and attachments, pictures, web pages, business applications and games in indoor, outdoor and dark environments. The BlackBerry Pearl also introduces an incredibly intuitive user interface with a supple, responsive trackball that makes vertical and lateral scrolling fast and easy. Dedicated 'menu' and 'escape' keys on either side of the trackball along with context sensitive menus make navigation instinctive, smooth, and true to the BlackBerry experience. (RIM, 2007b)

[237] Later RIM offered a modified Pearl named "Style" (released in 2008), also known as the Pearl flip phone, a device that included all of the functionality of the Pearl but mirrored the flip-phone style popular in North America following the success of Motorola's Razr line (Biggs, 2008).

broader experiential frame RIM sought to cultivate in its marketing and advertising initiatives.

The release of the Pearl in 2006 was accompanied by an extensive marketing campaign, the most extensive and, until that point, arguably the most important that RIM had undertaken. As several authors have noted (Reeves, 2007; Hamblen, 2008), the Pearl was conceived and positioned as a tool for the prosumer—not the prosumer of the business enterprise world, but of the web 2.0 era (an individual that needed to be connected at all times, that was producing and consuming data ubiquitously).

An early commercial for the Pearl, jointly produced with Virgin Mobile (a major telecom supporter of RIM's new strategy), sums up the new identity RIM was trying to cultivate. The commercial[238] is constructed as a day in the life of one of an ideal user. Following a young, female, urban professional, it begins in the morning and concludes in the evening. Over the course of two minutes the commercial illustrates the seamless integration of the Pearl device in work and social life and highlights the importance of ubiquitous connectivity in structuring the rhythms of the day. Equally on display are the new multi-media features that construct her as both a producer and consumer of content—she listens to music, communicates with friends using messaging and voice, finds a restaurant through GPS mapping, takes pictures of friends and quickly uploads them to Facebook, and so on. What is clear in this example is that the value of UC is intimately related to its role in mediating a desirable, if not essential, lifestyle. The device

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[238] Available at http://www.youtube.com/watch?v=fi5q_clYfIo&list=PL3DA10E41CB94324C

itself is prominent in moments of work productivity, socialization, and "unproductive" downtime.

A more recent commercial for the Pearl 3G mirrors a similar day in the life narrative, but tellingly ends with the tag: "Carry friends in your pocket." All pauses in daily life are eliminated by the BlackBerry's capability for UC in that every moment is an opportunity for communicative production where boredom loneliness, isolation, and seclusion are abolished. The message is clear: everyone is now part of the ubiquitous network.

The Pearl marketing campaign extended to other areas as well, including a dedicated website that provided important profiles of different types of Pearl users in the hopes of demonstrating the versatility of BlackBerry devices beyond business and corporate users. These profiles "offer the richest example of the prescriptive nature of the promotional materials for the BlackBerry and Pearl, as the profiles serve as scripts to viewers, notifying them of the potential uses and image that BlackBerry use signals to others" (Reeves, 2007).[239] Perhaps most tellingly, Reeves notes the astonishing claims made by unofficial Gen-X spokesman Douglas Coupland, who is quoted saying, "[The

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[239] While the original website has now since been changed, Reeves describes the range of profiles offered on the website when it launched in late 2006:

> Explore the lives of extraordinary people by looking inside their BlackBerry Pearl smartphones." The profiles include the following public figures: Martin Eberhard, the man who invented the world's first production electric sports car in Silicon Valley; Gretchen Bueiller, the 2006 Winter Olympics silver medal winner in snowboarding for Canada; Mariska Hargitay, an actress in the television show *Law & Order: SUV*; Richard Wright, an owner of a modern art auction house in Chicago; and Douglas Coupland, a Canadian writer and artist particularly known for his book *Generation X*…the combination of the personalities selected to profile represents an entrepreneurial, pseudo-celebrity, creative class. The stories presented purport to be tales of success that anyone could achieve with the right dedication, work ethic, and of course - technology product. (Reeves, 2007)

Pearl] is a transformer, it's a lens. It allows you to exercise your free will and your sense of time more creatively. And somehow humanize you and make you more humane. I mean that's a lot of thing(s) for a little guy to do."

The Pearl was designed to be used primarily by those *outside* of business and other such organizations. Reeves concludes her analysis of RIM's online promotional discourse concerning the Pearl noting that,

> The Pearl is pitched as an enrichment device that enables maximum pleasure and benefit in all areas of life, while projecting a persona of cool style through the sleek design, which is one of the primary features highlighted on the Pearl website. RIM has applied the business-originated productivity prerogative to concepts of family and leisure which have been included in the consumer messaging to create the context and need for its device in everyday life. (Reeves, 2007)

Overall, the reviews of the device were highly favourable and it was quickly deemed to be a success, demonstrating not only a new era for RIM but for the smartphone itself as a mass consumer device. *New York Times* reviewer David Pogue gave it a gushing review (Pogue, 2006) and the *Wall Street Journal* called it "a beautiful piece of work" and "a very nice combination of hard-core email capability and fun features" (Mossberg, 2006).

Following closely on the release of the Pearl, RIM released another smartphone called the Curve in early 2007. Unlike the Pearl, which was shaped like conventional cell phones, this new BlackBerry maintained the full QWERTY keyboard and it had a larger screen with more features including a better camera, faster processor, and high-resolution capabilities (RIM, 2007c).[240]

[240] The press release for the Curve outlines in detail its multi-media functionality to be a primary selling point: “The BlackBerry Curve features a liquid silver finish, chrome highlights, smooth edges and soft curves. It is a full-featured smartphone with a full QWERTY keyboard and large display and yet it boasts an impressively small and lightweight design at 4.2" x 2.4" x 0.6" and approximately 3.9 oz. The ultra-bright 320x240 display brings images and video to life and includes RIM's light sensing technology that automatically adjusts backlighting levels for indoor, outdoor and dark environments. The handset also features RIM's innovative trackball navigation system that makes scrolling and selecting fast and easy. The BlackBerry Curve comes with a 2 megapixel camera, complete with 5x digital zoom, built-in flash, self-portrait mirror and full screen viewfinder. The camera can capture images in up to three picture quality and size resolutions that can be shared instantly by email, MMS or BlackBerry Messenger and transferred over Bluetooth or USB cable. Photos can also be immediately set as a unique caller ID or Home Screen image. The audio system is crisp and clear, playing music and videos through the handset's integrated speaker or through the 3.5 mm stereo jack. The Bluetooth stereo audio profile (A2DP/AVRCP) is supported, and dedicated volume controls are conveniently located on the side of the handset. A powerful new desktop media manager is also included with the BlackBerry Curve. The Roxio Media Manager for BlackBerry, which was developed with Sonic and based on the award-winning Roxio Easy Media Creator 9, introduces a new level of simplicity, allowing users to easily search for media files on their computer, view and organize them, create MP3 music files from CDs, add audio tags, create playlists and automatically copy or convert pictures, music and videos for optimal playback on the BlackBerry Curve. The media manager also includes Roxio Photosuite 9 LE, a comprehensive tool that makes it easy to edit pictures and create photo albums. With PhotoSuite, pictures can be cropped, rotated and straightened, and flaws can be fixed by removing redeye or changing the brightness, contrast and saturation levels. Pictures can even be enhanced with color filters and special effects. The media player on the BlackBerry Curve has been refined, allowing users to search for music by simply typing the title, genre, artist or album name. Videos can also be played in full screen mode” (RIM, 2007c).

Figure 23: Print ad: "Your Connection to Everything that Matters." (RIM, 2007)

Figure 24: Interactive web ad for the Pearl featuring Douglas Coupland (RIM, 2006).

RIM's new devices were also priced slightly lower than previous ones. In comparison to other BlackBerrys, the Pearl and Curve had a relatively lower price point (starting at around $399 USD in 2007, or $200 with a three year contract with T-Mobile) that would appeal not only to a mass domestic market but also to consumers overseas (Long, 2010). For Europeans this was particularly important because unlike in North America, where the cost of devices is largely subsidized by wireless providers through multi-year contracts, users directly absorbed the bulk of handset costs. The Pearl bridged the divide between conventional cell phones (with the typical candy bar shape that emphasized voice) and smartphones (by offering an operating system and wireless data networking supporting mobile internet uses). Because of the full QWERTY keyboard, combined with general BlackBerry functionality, the Curve became one of the most popular smartphones in North America (Reuters, 2009). It also became a popular phone in non-North American markets like Europe and South-East Asia where texting was more commonplace and where various deals with local telecom providers made the device and data plans (because of RIM's integrated mobile virtual network capabilities) widely available even for customers with in lower incomes (Silver, 2009b).

Perhaps most significantly, RIM's prosumer devices brought smartphones to a mass international market, and with this expansion the marketing and advertising language valorized BlackBerry as a lifestyle device rather than one that primarily serves employees and business-related activities (Anonymous, 2007; Blakely, 2007; Malykhina, 2007; Moses, 2006). In so doing, the symbolic world created therein countered the perception of the BlackBerry as an invasive tool of labour control, or as a device for blurring the lines between work and leisure.[241] Instead, BlackBerry was re-designed and re-conceptualized as a brand embracing a lifestyle consonant with web 2.0.

RIM's prosumer strategy was successful in another sense. On a global level, RIM helped carriers make wireless data something everyday consumers were willing to pay for. Then co-CEO Jim Balsillie echoed the importance of constructing a consumer base for wireless data as a key selling point to wireless providers, as they were the crucial gatekeepers in making the device available to consumers. "'To sell data services to a consumer is far, far more difficult than selling enterprise data. It has been overwhelmingly difficult for the carriers,' confessed Mr. Balsillie. 'Carriers said, "If you can crack this code for us, we can push you into the bigger market." BlackBerry has proven that it is enormously profitable [for carriers]'" (quoted in Austen, 2006).[242]

While the Pearl and the Curve represented the vanguard of RIM's new mass market strategy, RIM also began harmonizing features across its smartphone products thus minimizing the differences between what constituted an enterprise level versus a "consumer" device. Indeed, all of RIM's BlackBerrys still maintained strong ties to the sphere of corporate/enterprise uses since all could easily be integrated using a BlackBerry Enterprise Server.

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[241] The term "crackberry" perhaps best captures the complicated relationship many users have with their BlackBerry. The term quickly passed from colloquialism to official terminology when in 2006 Webster's dictionary publisher John Wiley & Sons deemed "crackberry" winner of the "Word of the Year" contest (Wheaton, 2006).

[242] By the end of 2010 BlackBerry OS was responsible for most Internet usage among smartphones, accounting for 34.3% of the traffic, beating both Apple and Google (Anonymous, 2010). This advantage was short lived.

7.5 Going Social

A year after the launch of the Pearl, in October of 2007, RIM released an integrated Facebook app for its new generation of smartphones. Until this point if someone wanted to access Facebook on their smartphone they had to use a clumsy mobile web browser to log in. As such, social networks like Facebook and MySpace were not optimized for mobile use. Given the explosive growth of web 2.0 services, RIM began incorporating social networking as a core capacity of their new prosumer BlackBerrys in 2007. News reports alluded to a crucial evolutionary step for both the smartphone and social networks: “The Facebook-BlackBerry announcement is the latest evolution of smartphones into an all-in-one device for anyone, not just harried business execs addicted—if not tethered—to the office” (Cuneo, 2007). At the time of its launch Facebook was already one of the most popular web destinations for mobile users. What BlackBerry offered in partnering with Facebook the incorporation of push-based notifications into the mobile app. “The application leverages the push-based BlackBerry system architecture and Facebook Platform to create an unparalleled mobile experience for Facebook users” (RIM, 2007).[243]

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[243] RIM’s full press release explained how the BlackBerry/Facebook partnership would work:

> Research In Motion today launched Facebook for BlackBerry Smartphones, an exciting new BlackBerry software application that enables fast, streamlined and optimized mobile access to the popular Facebook social utility using a BlackBerry smartphone. The application leverages the push-based BlackBerry system architecture and Facebook Platform to create an unparalleled mobile experience for Facebook users.
>
> With the Facebook for BlackBerry Smartphones application, Facebook users can wirelessly send and view messages, photos, pokes and Wall posts. The rich, native application goes beyond browser-based access, automatically pushing notifications to the user’s BlackBerry smartphone as friends and colleagues send notes, Wall posts or pokes. The application allows users to take a

Figure 25: Web ad for Facebook for BlackBerry (RIM, 2007).

RIM's incorporation of Facebook into their devices also meant that the social network could become an integral part of the mobile workforce. By April of 2008, downloads of the Facebook for BlackBerry application exceeded 1 million (Gillin, 2007).

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photo, upload it to the site with captions and tags; quickly and easily invite friends; manage events; manage photo albums; and manage their status while on the go.

Facebook is one of the fastest growing web destinations among BlackBerry smartphone users and it has become an important element in the evolving fabric of personal communications," said Mike Lazaridis, President and Co-CEO at Research In Motion. "Facebook and RIM share a vision for enhanced mobile communications and social networking based on open, standards-based platforms and this has allowed us to produce a rich mobile application for Facebook users that leverages the push-based architecture, multimedia features and industry-leading usability of the BlackBerry solution." (RIM 2007)

In September of 2008 RIM announced a strategic partnership with MySpace (at the time a leading social network). In addition to mobilizing all of the networking and multi-media functions associated with social media sites, RIM's major emphasis was on the push-based qualities incorporated into MySpace's functionality.

> MySpace for BlackBerry smartphones integrates MySpace's main social networking components with the BlackBerry platform to provide instant, push-based messaging to BlackBerry and MySpace users. As part of this collaboration, RIM is also creating a BlackBerry community page on MySpace for users to access the latest BlackBerry smartphone news, content, videos, games, ringtones, skins and other unique and engaging features. (RIM, 2008b)[244]

In the week following the release of the MySpace integrated application it was downloaded more than 400,000 times, a record for both companies (RIM, 2008b). Jim Balsillie explained the success as follows: "This rapid adoption is a reflection of an evolving consumer lifestyle where social connectivity and information access are more

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[244] The full press release reads:

> MySpace, the world's premier social network, and Research In Motion (RIM) a global leader in wireless innovation, today announced they are joining forces to develop an integrated MySpace Mobile experience customized for BlackBerry smartphones. The new MySpace for BlackBerry smartphones application is fully optimized to deliver rich content and data to users on the go. MySpace for BlackBerry smartphones integrates MySpace's main social networking components with the BlackBerry platform to provide instant, push-based messaging to BlackBerry and MySpace users. As part of this collaboration, RIM is also creating a BlackBerry community page on MySpace for users to access the latest BlackBerry smartphone news, content, videos, games, ringtones, skins and other unique and engaging features.
>
> "MySpace and RIM are at the forefront of the mobile social networking evolution,: said Chris DeWolfe, chief executive officer of MySpace. "Our partnership enables millions of BlackBerry smartphone users to leverage MySpace on the go and access content, friend networks, and status and mood updates anywhere at any time." (RIM, 2008b)

important than ever. This powerful new mobile application combines social networking and mobility in a highly personalized and empowering manner and we are very excited to see such a positive response in the first week” (RIM, 2008b). RIM partnered with MySpace and Facebook early on as yet another component of their new strategy—later extending to social networks such as Twitter and LinkedIn (among others). These partnerships reflect and further the integration of hardware, software, and social networks directly in the devices themselves (and this took place *before* other smartphone providers had fully recognized web 2.0 as a mobile strategy (Facebook was not released as an app for the iPhone until July 2008, almost a year after the BlackBerry version). Central to each of these partnerships was the integration of the BlackBerry’s always on, always connected, push-based technical capabilities. What once was limited to emails and instant messaging, now became an integrated part of so-called “social media” itself.

Partnerships did not end there. As marketers working for RIM explained in interviews, such partnerships helped to create brand awareness for non-BlackBerry users of MySpace and Facebook; that is, these partnerships allowed for the extensive cross promotion of both devices and social networks.

> For us it was that we build products and we have partnerships with all these big brands, Yahoo, Google, Facebook, Microsoft, MySpace, Twitter, Youtube. We’re not just paying them to advertise, we’re not just paying for online marketing, or whatever, we’re actually partnering with these companies using their marketing engine to get the BlackBerry brand out. One example is the MySpace application, Tom, the MySpace creator, sent a blast to advertise the BB app to every MySpace user. You can’t even pay for that. If you want to have a product page you need to

> pay 350k. We don't pay for advertising because we have a partnership. With Facebook we can share information with them, to get site information on the back end to see how our page is doing and leverage that because of our partnership. Or Microsoft who's got a product partnership, they own 80% or Facebook's advertising, so we can use that channel. So it's this whole integrated thing that we can leverage that is different from typical media buying. (personal communication, June 23, 2010)

Released with the BlackBerry OS 6.0 in 2010, one of the important applications developed by RIM for its web 2.0 devices is called a "social feed" which functions as an aggregator of streaming data across social networks and news sites. Someone who uses Twitter, Facebook, LinkedIn, MySpace, or who subscribes to RSS feeds would find all of the relevant updates aggregated together in one application that sits on the BlackBerry home screen.

The importance of building these partnerships was not lost on the telecommunications carriers who recognized that these would generate more revenues through the use of wireless data. Social networking features were key ways of building audiences for their services. Furthermore, it was assumed that social networks would be a means of growing revenues generated through "premium" services.

Content creation was but one element of the overall political economy of web 2.0 as it linked the exploitation of unpaid user-generated content (UGC) (like that on Flickr, or Youtube) with marketing imperatives seeking to exploit the personalized data flows (both active and passive) of the new prosumers. Because of the nature of digital mediation, content also constitutes seemingly mundane activities like text messaging, multi-media messaging, emails, tweeting, or mobile-blogging ("mobloging"). In addition, the digital labour involved in producing this content (defined broadly) through the use of networked, personalized technologies like the BlackBerry exponentially heightened the profitability of wireless data services as socializing and content sharing required greater wireless data rates and bandwidth.[245] As elaborated in chapter 3, the commercialization of wireless data was a long process, taking decades for technology and consumer demand to reach profitability. In this process, wireless data itself became enthusiastically promoted by national and international telecommunications providers (see Foggin, 2005), culminating in the web 2.0 euphoria that not only valorized UGC but also positioned IMDs as the paradigmatic expression of individual empowerment since these devices incorporated the specific identity, social networks, and intellective capacities of users.

Moreover, it was believed that such networks would facilitate the sharing of pictures, songs, and video, thus converting such social functions into profitable wireless data capabilities. For RIM, the audience for smartphones was a combination of individual users and telecommunications carriers, both embracing the web 2.0 view of sociality as a highly technical endeavour, mediated not only by devices, but also by wireless data services hooked directly into popular social networking sites. Even though social networking sites may change with the times (as the failure of MySpace evidenced) the basic infrastructure, comprising handsets and networks, would remain profitable since it

[245] To illustrate the rapid growth of global mobile data usage, consider that Cisco estimates that the global mobile data usage in 2011 was eight times greater than the total global Internet traffic in 2000. Based on current trends, Cisco estimates global mobile data usage will increase 18-fold by 2016, for traffic of roughly 11 exabytes per month (Cisco, 2012).

was only through its development and use that the sociality of web 2.0 could be maintained. This is the key point: social networks, which have existed as long as human society has, are becoming increasingly dependent on a complex chain of private companies whose infrastructure and commodities are being (or have become) integrated into everyday life.

In addition to partnerships with social media, RIM began cultivating relationships with game developers to make the BlackBerry more desirable to consumers, and to highlight the capability of their devices as multi-media platforms (Guth and Vascellaro, 2007). One such partnership was with French video game maker Gameloft, creator of such as popular console-based games as *Prince of Persia* and *Assassin's Creed*. This early partnership, initiated in 2007, was one of the first to merge new smartphones with video game culture in the quest to expand the audience for both.[246]

Canadian game developer Magmic focused on bringing *connected* games to the BlackBerry platform. Games like Tetris, Scrabble, and Texas Hold'em poker became networked through the mobile device thus making them part of a community of gamers

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[246] Gameloft's justification for developing on a mobile platform is directly related to RIM's inclusion of technical features that support more advanced gaming:

> Gameloft, a leading maker of games for cellphones, plans to announce today that it is bringing its line of mobile games to the BlackBerry in hopes of grabbing a chunk of the device's expanding market. To date, Gameloft's titles have been available for download onto hundreds of models of cellphones, but the company did not see much point in bringing them to the boxy, drab devices used almost exclusively by business professionals. But with BlackBerry models now equipped with better graphics and multimedia features, and the sleek new Pearl available for about $200 with a service plan, the market is changing, and software companies like Gameloft and Magmic see an opportunity. (Flynn, 2007)

and friends that could compete, share scores, and generally interact through their mobile gaming platform. This “gamification” (see Bogost, 2011) of smartphones is now an important force driving mobile innovation (and exploitation), particularly with the introduction of the iPhone and iPad as gaming platforms. For RIM, games also were an important way of attracting a new consumer-base for the BlackBerry. In addition, the use of the BlackBerry as a means for consuming games anticipated the much broader app economy that would develop in the wake of the iPhone and this ultimately, would help transform of the BlackBerry from a primarily communication based device to one that became a platform for virtual consumption.

As part of expanding the entertainment usage of the BlackBerry, music consumption also was an important component of this development with RIM building partnership with Slacker radio which became its first music application designed specifically for BlackBerry that allowed personalized music streaming. “Slacker lets music fans ‘create’ their own stations by typing in the names of artists they like. Slacker's twist: It also offers DJ-programmed "genre" stations (rock, country, jazz, blues, etc.) and a bigger music library (nearly 3 million songs vs. 700,000 for Pandora [a rival music streaming service])” (Graham, 2009).

RIM’s embrace of social networks and networking offered a means to expand the audience for other services available on the BlackBerry platform. RIM brought UC to social networks in order to build new revenue streams beyond the simple utility of voice and email communication.

7.6 BBM and Apps

In 2009, RIM released what would be its most important post-web 2.0 innovation: its own social network fully integrated into each BlackBerry device (operating over RIM's global wireless network). In this move, the devices themselves were integrated into a RIM-hosted social network thus creating a BlackBerry branded community. The early development of the BlackBerry Messenger (or simply BBM) system was BlackBerry-specific instant messaging service that used the unique PINs assigned to each BlackBerry device to enable text communication between users. BBM was an Internet-based text messaging service that superseded traditional SMS/Text services which used the protocols of a specific network carrier and its wireless standard. In 2009, RIM released a crucial upgrade to this service with its release of BBM 5.0. This new iteration of BBM reflected the important role of social networking as a narrative defining the mass consumer market—it was social uses that people wanted and they wanted to remain connected to their respective social networks not only through voice, but text messaging, email, and instant messaging (like BBM). BBM 5.0 was a makeover that made the built-in messaging service more like a social network, with user profiles, avatars, friend lists, and multi-media functionality.

The "5.0" designation was primarily a marketing tool to synchronize this service with the rollout of its OS 5.0 rather than an actual generational descriptor. It allowed customers to add other BBM users and to add friends using quick-response (QR) codes or simply by touching the devices together. Indeed, one of the important innovations that BBM offered was that it was a network through which any BlackBerry user could belong, literally integrated both into the devices and the BlackBerry wireless network that spanned the world. BBM offered users an easy way to build social networks through their devices, swapping PINs or, increasingly, barcodes simply by bring individual devices together. Moreover, BBM could be integrated into working environments because it allowed scalable messaging groups and a feedback loop that informed messengers if a message had been delivered and whether it was read or not. This feedback loop put pressure on BBM users to make quick responses and, particularly in a work context, allowed managers to see how long response times would take between reading and responding to messages. BBM became a crucial selling point in international markets as a way of overcoming often-costly text messaging tariffs imposed by regional/local telecoms because BBM operated over the network that RIM created and that was routed through its specific servers. It made global and ubiquitous the messaging capabilities that had previously only been available through the BlackBerry Enterprise Server (BES), or by subscribing to telecommunications providers. This social function was one of the main reasons that BlackBerry became an international success, and continues to be one of the primary reasons why it is still being adopted in the face of direct competition from Apple and Google. Although both now offer similar services, neither one can offer the end-to-end integrated network that defines BBM.

BBM effectively created the world's largest dedicated mobile social network because it automatically linked any BlackBerry user together and allowed them to create groups, profiles, and share media in a similar fashion to Facebook but optimized for the BlackBerry platform. Moreover, it acted in concert with the BES because it allowed enterprise-wide, or institutional, text messaging that was often more convenient or faster than email. BBM became one of the most important selling points for BlackBerrys internationally, particularly among younger users and users in developing countries where texting costs were prohibitively high. It encouraged a mass uptake of BlackBerrys because each device was immediately integrated into a social network (Kiladze, 2010).

Figure 26: Print ad (RIM, 2010)

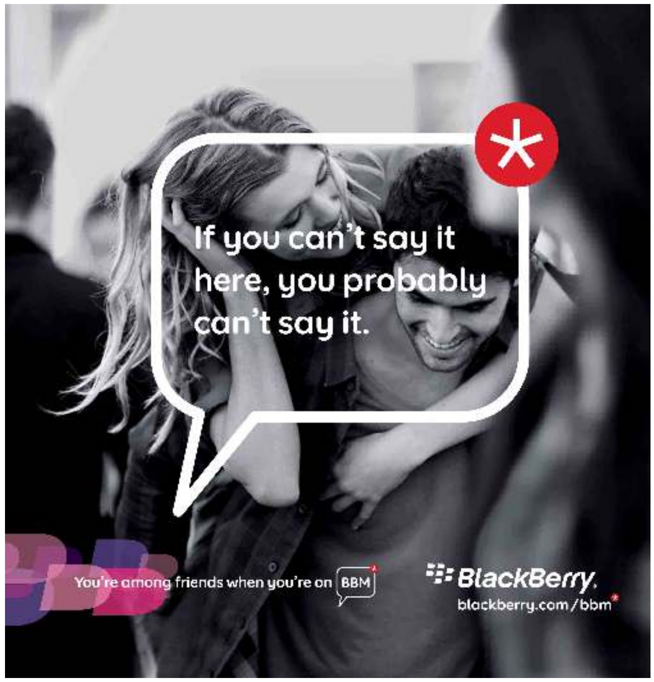

Figure 27: Print ad (RIM, 2010)

Figure 28: Print ad (RIM, 2010)

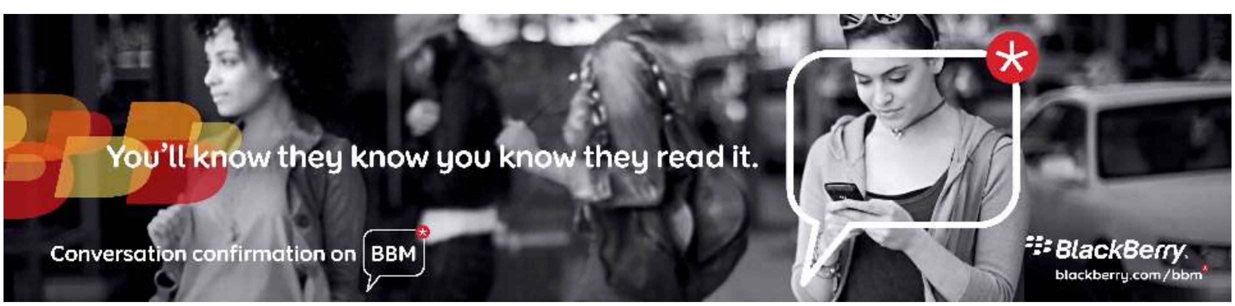

Figure 29: Print ad (RIM, 2010)

In 2010 RIM released a more "social" platform that allowed the direct integration of applications into BBM (RIM, 2010). This created an incentive for app developers because it offered them a massive and connected audience to create applications for—effectively opening up the BBM platform for an expansion of virtual consumption overlaid onto its social function.

By the end of 2010, BBM had roughly 30 million users globally and was hailed as one of the most important components of the BlackBerry's international success (Kiladze, 2010). By mid-2012 the number of worldwide BBM users stood at approximately 55 million (Connors, 2012). But this success also generated controversy. In 2010 there was a protracted dispute amongst a variety of countries regarding the encryption of BBM services, which were routed through Waterloo. Countries like India, Saudi Arabia, and others demanded that they be able to monitor or gain access of the data now flowing into and out of their country by BlackBerry users (Associated Press, 2010; Bajaj, 2010). Questions of national sovereignty were raised because BBM allowed data to be encrypted and decrypted only by RIM itself, leading many to make arguments about national security and surveillance since the devices could be used by terrorists or criminals to coordinate attacks or other illegal or politically threatening activities. Though resolved, the nature of the resolution has been highly secretive (Bajaj, 2010).[247]

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[247] More recently, the unexpected rioting in London, England was largely attributed in the media to the popularity of the BBM messaging service which is the most popular smartphone platform in the UK, in part because of its built-in nature and the relatively cheap and/or subsidized costs of BlackBerry handsets. It was argued that the combination of the social networking, instant messaging, and encrypted data capabilities allowed BBM to act as a force multiplier, giving the rioting and rioters the ability to coordinate looting and violence ahead of police intervention (Butcher, 2011). The term "flash mob" was often applied to this process, but the London rioting evidences a much more rational and sustained mob mentality, in part enabled by the mobility and ubiquity of BBM. While BBM may have played a role in intensifying rioting in London, the media narrative centered on the role of technology as a catalyst, and not on the growing

BBM was conceived as a central component of RIM's overall app strategy. Though RIM has long focused on turning its BlackBerry platform into an application ecosystem, the development of apps primarily focused on industry or specific organizational applications, thus limiting the range of potential applications available to consumers. BBM became a mechanism upon which to build the social dimensions of the BlackBerry's application ecosystem. BBM focused this strategy by offering an opportunity to leverage its branded community to seamlessly integrate more diverse "social" applications (Connors, 2011; RIM, 2012). BBM was crafted and used to make UC social in ways that were linked to the BlackBerry brand, but also providing the secondary goal of expanding the range of consumable applications for a diverse customer base (Cheng, 2009; RIM, 2012). With the launch of App World and the central focus on BBM, RIM used its UC capabilities to develop its own social networking platform.

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disparity amongst Londoner's, particularly the youth, in the wake of severe austerity measures of the past few years (Halliday, 2011).

Chapter 8 – Conclusion: Ubiquitous Connectivity as Media Environment

8 Postscript on the BlackBerry: From Ubiquity to Decline

Over the course of this dissertation I have mapped and historicized the rise of ubiquitous connectivity (UC) by looking specifically at the BlackBerry as a technological artifact. In doing so, I have demonstrated how the relative success of the BlackBerry in commercializing UC for both organizations and consumers has been the result of the convergence of political economic imperatives, technological innovations, and cultural myths. Throughout I have referenced the significance of ubiquity, immediacy, and personalization as key elements, not only of IMDs, but also for the study of contemporary digital media generally. I have focused on the BlackBerry precisely because its brand identity, political economic significance, and functional characteristics articulate these themes through the prism of UC as myth.

In 2009, the relative success of the BlackBerry as a global brand "ambassador" for UC was demonstrable, not only in RIM's devices, services, and marketing campaigns, but in the economic data summarized at the end of chapter 7. Indeed, 2009 was the tipping point for RIM and the BlackBerry as the IMD market came to be increasingly dominated by Apple's iPhone and the various Android-based handsets. This tipping point, however, is indicative of the broader maturation of UC as a basic staple of everyday life, even in places (like on the African continent) where traditional consumer technologies had been ignored due to insufficient demand, high cost, or lack of infrastructure (Arnquist, 2009; Evans, 2012; Wright, 2008).

RIM's prospective decline has fueled intense speculation since the launch of the iPhone. Rarely a day goes by without another obituary for RIM and the BlackBerry. The resignation of co-CEOs Mike Lazaridis and Jim Balsillie in 2012 further signalled the dramatic changes both in the company and its specific claim to a branded experience of UC. Whether these assessments are based on sound economic analysis, hysteria born from the "animal spirits" of a chaotic marketplace, or the need to provide regular content for business and technology blogs is debatable. Regardless of the reason, the signs of decline are palpable, though champions of the BlackBerry brand persist, and sales continue to grow in many developing markets (Africa, Latin America, and South-East Asia are still areas of growth for the BlackBerry). RIM, now rebranded as BlackBerry to create consistency between its product lines and corporate operations, is in the midst of re-booting its brand of devices by launching an entirely new operating system and app development platform. Whether it will be a success is still unclear.[248]

The question of RIM's decline is intimately tied its own role in the reification of UC as a now taken-for-granted expectation. Indeed, the success of the BlackBerry as a unique branded arguably has been occluded by its experiential universalization (at least in relatively "developed" political economies). Declining handset costs, increased processing power, and expanded mobile bandwidth capacity all have enabled IMDs to develop into ubiquitous platforms for the consumption of software and services. In this context the myth of UC, now "naturalized" through the forces and processes addressed in this dissertation, has become the context for a consumption-focused app economy. Thus

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[248] Jim Balsillie's recent sale of his remaining stock has been interpreted as a profound lack of confidence in this possibility (Hartley, 2013).

UC is no longer a selling point for RIM. Instead, its success has contributed to its demise as UC itself has become an expected technical and experiential characteristic of mobile media.

One way to think about the advantages that Google and Apple now have over RIM is to consider Moore's Law[249] regarding the exponential growth of micro-processing power; in this sense, it is much easier for the Google and Apple to scale down their software to mobile computing platforms than it is for RIM to scale up their software to fully take advantage of now more plentiful, cheaper and more powerful processing power. In part this is because the basic architecture for the BlackBerry was founded at a point in which wireless data capacity and spectrum efficiency was low and/or scarce. Given that such capacities have undergone significant developments, the growing infrastructure and transmission capabilities of wireless data networks (and their associated fixed capital expenditures) now constitute an economic incentive for telecoms to promote the data *intensive* applications of Google and Apple. In other words, the efficiencies that RIM's earlier products provided are no longer as important to telecommunications companies in relation to their current interest in maximizing the use of their wireless infrastructures. Support from telecommunications providers is crucially important because wireless carriers remain the so-called kingmakers for the success or failure of handsets (especially in North America where, to repeat, they subsidize the costs of handsets in exchange for multi-year contracts from consumers).

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[249] Moore's Law, named after Intel co-founder Gordon E. Moore, states that the processing power, of the microchip including the number of integrated transistors, doubles at least every 18 to 24 months. See ftp://download.intel.com/museum/Moores_Law/Video-Transcripts/Excepts_A_Conversation_with_Gordon_Moore.pdf

Although the ascent of Google and Apple took several years, the signs of this shift were imminent in Apple's initial iPhone release in 2007. While RIM was responding to and extending the fervor surrounding the development of web 2.0 by releasing new devices, Apple unveiled what would ultimately constitute a market-changing device that transformed the expectations of both consumers and telecommunications providers.[250] Assessing the iPhone's success offers an important postscript for understanding the transformation of UC and suggests a few reasons its ascent over the BlackBerry as a perceived market leader. Though not exhaustive I offer the following reasons:

1. The iPhone featured a sensitive touch screen (with a relatively intuitive user-interface) that increased the overall screen size of the device, thus allowing for greater visual graphics and a more interactive interface.[251]
2. The iPhone focused on high-end consumers, leaving Android-based phones (which mirrored the iPhone's aesthetics and functionality) to target more cost-conscious consumers, making it more difficult for the BlackBerry brand to retain its relatively high device and service costs.

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[250] By 2012 RIM's BlackBerry's had been relegated to a distant fourth place in global IMD market according to operating system (Gartner, 2012).

[251] Although somewhat delayed, RIM defensively responded to the new expectations of consumers and commercial interests within the mobile ecosystem. The first was the development of the Storm, including RIM's first all touch-screen based interface. Released in 2009, the Storm was somewhat disappointing, with several bad reviews and limited demand. It attempted to compete directly with the iPhone, and the multiplicity of other touch-screen based Android phones that were now emerging in the wake of the iPhone's popularity, and the profitability of the app ecosystem that had developed alongside the iPhone. More recent iterations of the BlackBerry Bold/Curve feature touchscreens, though they do not change the basic shape of the device. Commentators and analysts have argued that such adaptations to existing designs are too little too late, but they do illustrate RIM's desire to monopolize on changing user preferences and expectations; indeed, the touch screen is an important part of stimulating the app ecosystem because many of the most popular apps now are based around touch functionality.

3. Apple's iPhone was built on the success and familiarity of its iPod portable music devices that provided a wide range of consumers an introduction to the Apple device and software ecosystem.
4. The iPhone was fully integrated into iTunes, which provided an instant and straightforward way of selling iPhone-specific software or apps among other digital content like video and songs.
5. Through iTunes, Apple created an app ecosystem that allowed software developers a direct channel to monetize their software. This generated a virtuous cycle for the iPhone platform because it offered a clear monetary incentive to develop software. As a virtual storefront, iTunes was already familiar with many users who entrusted Apple with their credit card information thus for the easy purchase of applications. In so doing, iTunes helped rapidly expand the range of things the iPhone could do—from location-based services to video gaming—thereby increasing the appeal of the device and its ecosystem to consumers.

Among these reasons, perhaps the most important is the role of iTunes in stimulating what can be termed an app economy. A 2010 estimate projected that this "economy" will generate an estimated 77 billion downloads and $35 Billion USD in revenue by 2014 (Miller, 2010). This was an important step, as already noted, in creating a large audience of digital prosumers primarily because apps offered clear tools for the production of marketing data by offering a so-called "free lunch" (Smythe, 1981)—that is, free applications delivered in exchange for user data. The app economy, seemingly overnight, fundamentally changed the relationship between handset manufacturers, software developers, telecommunication providers, and users. As virtual storefront, iTunes offered a means of transforming mobile users into an active audience of potential consumers of devices, applications, and other virtual goods, while at the same time creating a highly personalized channel for generating marketing data and targeting advertising. This was a level of personalization that had never before been possible.

At present, RIM's future, and that of the BlackBerry brand, rests solely on the success of its BlackBerry 10 set of devices and software. This re-introduction of the BlackBerry brand is meant to rebuild the entire franchise involving new software and hardware crafted to compete directly with the IMDs offered by Google and Apple. Released in early 2013, RIM focused on enlisting app developers to ensure a suitable range of applications that would be available as soon as the devices are released. Despite RIM's promotional rhetoric, many analysts remain skeptical concerning the company's ability to salvage its brand, and many are predicting a buyout, either in part or whole, by a much larger company seeking to secure RIM's software, patents, and networking business.

8.1 Democracy in the Age of Personalized Media and "Present-Mindedness"

Arguably, to repeat, the Blackberry's rapid decline reflects, paradoxically, its successful mediation and actualization of the myth of ubiquitous connectivity. This success has indicated the pervasiveness of UC as an almost common sense way of life for a growing number of people around the world.

I close this dissertation with some relatively speculative observations regarding UC and questions concerning the ethics and democratic politics of the future. As suggested at the outset, one of the central obstacles facing conventional democratic institutions is precisely the condition of immediacy (Tomlinson, 2007) that increasingly defines daily life under UC. This is a condition working against the time-demanding nature of citizenship, the long-term and communal visions of a public good, and the shared investments that enable people to participate in civic and democratic processes. Sense of self and community now, however, are increasingly embedded in digital media, reproducing an existential entanglement with the general speed up of capitalist production perhaps epitomized by the seemingly ephemeral and speculative global flows of finance capital which seemingly are not hindered by time or space. As I have noted, mobile and ubiquitous media are increasingly tangible expressions of these phenomena. At the individual level, the rise of marketing as a social mode of production in which consumers participate in their own self-commodification and objectification as consumer identities is a central part of contemporary developments involving mobile media.

The appearance of empowerment and transcendence reinforced by the personalized nature of this media environment is totalizing and thus difficult to resist. While being immersed in the highly personalized condition of UC makes it appear as though "our nervous system" is extended into "a global embrace, abolishing both space and time as far as our planet is concerned" (McLuhan, 1964, p. 19), as Kittler (1999) notes, this condition is merely a surface effect (1)—the appearance that masks a deeper, ontological and political economic essence. It appears as though we are extending ourselves, just as it appears as though our media is more social. In reality our media becomes more intentional, more intensive, more personalized, anticipating our communicative needs and behaviors (mostly as consumers instead of citizens) within a continuous flow of self-commodification.

Thus, if McLuhan's extensions of man thesis suggests a theory of media similar to that of the optics of classical Greece, modelled on the projection of human senses—like the idea that vision itself produced light; "Were our eyes not like the sun, they could never see it" (Goethe quoted in Kittler, 2010, p. 50)—an inverse theory is modeled on the *camera obscura*. Like it, this personalized media ecology promulgates alienated or detached reflections much like the auto-amputated selves produced by the narcissistic gaze of McLuhan's "Gadget Lover" (McLuhan, 1964, p. 51-56). Despite their differing emphases, both McLuhan and Kittler have highlighted how dominant media become not only the reflecting pools of the self or soul, but also their constitutive articulation.[252] Might not the technologies of UC, like IMDs, offer a similar phenomena, albeit one consonant with the You-topian world of web 2.0 and the prosumer—both contributing to self-commodification as a general social practice?

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[252] Kittler (2010) offers two historically significant examples in this respect: 1) the wax tablet of the ancient Greeks, "All that remained for Socrates and his enthusiastic interlocutors was to explain what the soul itself was. And lo and behold: a definition of the soul was immediately offered by the wax slate, that tabula rasa upon which the Greeks etched their notes and correspondence with their slate pencils" (p. 34); and 2) the invention of film which reconfigured how people described near death experiences, "Instead, at the moment of imminent death a rapid time-lapse film of an entire former life is projected once again in the mind's eye...in 1900, the soul suddenly stopped being a memory in the form of wax slates or books, as Plato describes it; rather, it was technically advanced and transformed into a motion picture" (p. 35).

Perhaps in partial validation of McLuhan's thesis that we become what we behold (see McLuhan, 1962, p. 265-264),[253] the so-called "attention economy" (Davenport & Beck, 2001; Terranova, 2012) works bi-directionally by compelling individuals to become vigorous self-promoters, competing for jobs, status, and popularity through increasing forms of self-commodification. Commodity fetishism, as Zygmunt Bauman argues, is now subjectivity fetishism (Bauman, 2007, p. 14). This condition has real significance for constitution of the labour market. As Marwick (2011) explains, "The ability to position oneself successfully in a competitive attention economy becomes a marker of reputation and standing." Instead of an abstract category, the labour commodity becomes more personal, unique, and spectacular as it competes for a diminishing number of well paying or paid jobs. Thus, as noted above, the attention economy under web 2.0 is as much about production as it is consumption—as much about the personal brand as it is about the commercial brand. The relative market value of both personal and corporate brands is fundamentally tied to the transformation of attention (which comprises both social communication and affect) into money. In both cases, today, the most effective way of doing this is to use personalized media as channels for capturing and monetizing attention.

Although IMDs are the most clear and tangible representations of personalized media, they are dialectically linked to the evolution of the World Wide Web as it becomes a hybrid environment comprising human and non-human communication in a seamless and ubiquitous flow of data. Without getting into the seriousness of the title,

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[253] A sentiment that echoes something Nietzsche wrote almost a century before: "Our writing tools are also working on our thoughts" (quoted in Kittler, 1999, p. 200).

recent speculation about "web 3.0" has highlighted the technological foundations of a new era of personalization to take hold. With respect to the digital economy, the productive necessity of personalization (and the forms of paid and unpaid digital labour enabled by IMD) was recently raised in a TechCrunch interview with Tim O'Reilly (web 2.0 proponent) and Reid Hoffman (founder of LinkedIn). In it they were asked to theorize what web 3.0 might entail. While acknowledging the problems behind the characterization "3.0," they both claimed that the World Wide Web will be primarily powered by the explosion of personal data generated by IMDs. Reid Hoffman explains that web 3.0 comprises "a torrent of innovation that's going to be unleashed by all of this personal data being collected."[254] Moreover, they both note how web 3.0, in effect, does away with anonymity as a basic characteristic of the Web, once and for all, as online and offline identities are fused together. This is perhaps one of the most significant yet least understood transformations involving modern digital media. Unlike in previous years, in which personal data was segregated in silos by organization-specific databases, the era of UC not only provides exponential growth in the quality and quantity of personal data, it also allows that data to be automatically indexed by user and location through the universal use of mobile technologies.

The Web is already increasingly defined by user preferences and filtering services. Hunch, StumbleUpon, and Reddit are examples of services that filter content based on user preferences, employing an algorithm that "learns" over time and that will be able to anticipate or predict what might be interesting to the user. In doing so, they all

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[254] Available at http://techcrunch.com/2011/04/18/so-is-web-3-0-already-here-tctv/

harness the activities and free labour of users to rate, rank, and tag content in order to make personalization more commercially useful. As artificial intelligence becomes more sophisticated, this process will become increasingly automated (triggered through machine-to-machine communication).

Web 2.0 already has given rise to services like Klout or Empire Avenue that act as means of measuring online influence, creating markets of self-branded prosumers. Social networks therefore begin to resemble distribution networks—markets for exchanging status points. The growth of participatory marketing (Honea, 2010) likely will harness the filtering and targeting mechanisms of the web, enabling individual users to collaborate in the process of marketing to themselves (Zwick et al., 2009) and rewarding individuals who build their personal brands online—fulfilling ever more explicitly the qualities outlined by Smythe in his description of audience work (1981).

In the realm of the social, this commodified personalization contributes to a closed symbolic world; one in which the control and preferences of the user are embedded in the very software and algorithms themselves. In contrast to the embodied flesh and blood individual, the digital self becomes a self-propelling algorithm that, if left uncontrolled, will work to personalize the symbolic and communicative landscape. While our dominant technological milieu adapts to, and reinforces, the creation of small "monadic communication clusters" (Gergen, 2008), individuals are tacitly encouraged (or enabled) to disengage from the human beings around them, as they are committed to their respective social networks, rather than civil society.

Indeed, this is precisely what Huxley feared, and is the crux of his argument in

Brave New World, thus making regular references by journalists "covering" technology all the more ironic. In distinguishing between George Orwell's *1984* and Aldous Huxley's *Brave New World*, Neil Postman writes:

> Orwell warns that we will be overcome by an externally imposed oppression. But in Huxley's vision, no Big Brother is required to deprive people of their autonomy, maturity and history. As he saw it, people will come to love their oppression, *to adore the technologies that undo their capacities to think*. What Orwell feared were those who would ban books. What Huxley feared was that there would be no reason to ban a book, for there would be no one who wanted to read one. Orwell feared those who would deprive us of information. Huxley feared the *truth would be drowned in a sea of irrelevance*. (emphasis added, 1985, p.xix).

In this case, "irrelevance" is a highly iterative process, one generating an increasingly opaque "telecocoon" (Crawford & Goggin, 2008) that increasingly short-circuits the possibilities for the socially accepted practices and measures of truth necessary for democracy to survive.

The prospective degradation of democratic institutions in an era of personalized media is mirrored at the physiological level. Indeed, Nicholas Carr (2010), and others (Stiegler, 2012; Terranova, 2012), have suggested that this media condition may be altering the structures of the brain, thereby foreclosing the capacity to think in particular ways (i.e., "deep attention"). As Terranova argues, in a media environment defined by the personalization, information—conceptualized as the process of being *informed*—

describes the various techniques and technologies for "consuming attention" (Terranova, 2012, p. 4). Thus the perceived abundance of information—conceptualized as a non-scarce, non-depletable resource—is countered by a growing scarcity and fragmentation of attention itself. Terranova writes that, "By consuming attention and making it scarce, the wealth of information creates poverty that in its turn produces conditions for a new market to emerge. This new market requires specific techniques of evaluation and units of measurement (algorithms, clicks, impressions, tags, etc)" (2012, p. 4). As such, attention is made more scarce but is also "degraded" (p. 4). The personalization of our media environment epitomized by IMDs enables the regular intervention of a ubiquitously enabled siren's song competing for smaller and smaller slices of our attention.[255]

Similarly, the implications of personalization on politics and culture seems to reinforce a tendency towards fragmentation, the creation of parallel communicative universes defined by closed symbolic structures of circular affirmation and group polarization. This is the un-reflexive tendency Innis tried to warn us against, for it is in society's ability to self-reflect, self-critique, that it is able to self-correct. At the level of political economy, we might consider the processes of personalization as one of symbolic enclosures in which the structure of wealth and privilege are reproduced in separate social and financial networks in ways that exclude non-participants (creating the equivalent of online gated communities). Overall, personalization is merely a cover for

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[255] In this sense, Google's massive market capitalization ($271 billion USD as of March 2013), indeed its entire business model, can be related to the various ways by which it monopolizes and monetizes attention (Lee, 2011; Pasquinelli, 2009).

privatization, which in a post-Fordist neoliberal era means a growing precarity of labour, increasingly made replaceable or disposable by the automation enabled by personalized media.

We can think of the growth of personalization in the era of ubiquitous connectivity as a feedback mechanism that flows through our personalized media. Historian of technology Otto Mayr (1971a, 1971b) wrote two articles about Adam Smith and the debatable influence of feedback technologies (the steam engine in particular) on the intellectual genesis of liberal economic theory. According to Mayr, the concept of a self-correcting, self-regulating system was the paradigm, the chief metaphor of the free market, in which the flows of goods, money and prices would create a self-correcting system that could maximize social welfare for the most number of people. We are now seeing that personalization of this sort falls closely in line with the beliefs and values of typical liberal market theories, using personalization and ubiquitous connectivity as a means of efficiently and instantaneously matching services and products with consumers (Manzerolle & Kjosen, 2013).

In this, capitalism's cybernetic imagination (Webster and Robbins, 1999), we can find buried Shannon's mathematical formula of communication, described as a noise-reducing feedback system (1949). This cybernetic imagination is preoccupied with the search for perfect information—the elimination of noise—that constitutes a mathematically perfect communication system; yet one subservient to the expanding algorithm of capital circulation and accumulation (Manzerolle & Kjosen, 2012). It is no surprise then that our means of communication and our means of exchange, of payment, are converging together. While personalization creates nearly perfect information about users commodified or commodity-defined, in the context of technologically mediated "social networks," noise will increasingly constitute those voices, opinions, and messages which do not already conform to our personally cultivated algorithm—voices, opinions, and messages that are outside of our preference schema thereby reinforcing a *present-mindedness* (Innis, 1964, p. 76) suitable to the impulses and work routines mediated by a state of ubiquitous connectivity.

Bibliography

Abbate, Janet. (1999). *Inventing the Internet*. Cambridge, Mass.: MIT Press.

Adrian, Merv, Rasmus, Dan, & Zetie, Carl. (1999, June 22). Connections are everything. *Intelligent Enterprise, 2*.

Ahmed, P.K., & Simintiras, A.C. (1996). Conceptualizing business process re-engineering. *Business Process Re-Engineering & Management Journal, 2*(2), 73-92.

Albanesius, Chloe. (2012, April 3). BlackBerry mobile fusion lets it manage RIM, iOS, Android devices. *PC Magazine*.

Alster, Norm. (2008, January 13). 3 names put tech above the fray, *The New York Times*.

Amberg, Michael, & Zimmermann, Frank. (1998). Enabling virtual workplaces with advanced workflow management systems. In Magid Igbaria & Margaret Tan (Eds.), *The virtual workplace*. London: Idea Group Publishing.

Andrews, Edmund. (1993, March 3). Business technology; radio-frequencies bill advances, *The New York Times*. Retrieved from http://www.nytimes.com/1993/03/03/business/business-technology-radio-frequencies-bill-advances.html?n=Top%2fReference%2fTimes%20Topics%2fSubjects%2fT%2fTelephones%20and%20Telecommunications

Anonymous. (1987, May). The virtual workplace: Global connectivity with a laptop PC. *Telecommunications Americas, 21*.

Anonymous. (1993). Apple Computer lays off 2,500 workers. Washington, D.C., United States, Washington, D.C.: National Public Radio.

Anonymous. (1994, October). Making the case for cellular modems. *Managing Office Technology, 39*.

Anonymous. (1999a, April). Motorola introduces a generation of GSM solutions. *Microwave & RF, 38*.

Anonymous. (1999b, April 12). 3Com and Aether Team to bring enterprise wireless data solutions to the Palm computing platform. *Business Wire*.

Anonymous. (1999c, March 1999). Millennium year will be big for wireless data, projects Andrew Sybold's outlook. *Business Wire*.

Anonymous. (1999d, August 4). Siemens financially wired into Omnipoint technologies. *Communications Today*.

Anonymous. (1999e, June 23). Research in Motion reports record results for Q1, *Canada NewsWire*.

Anonymous. (1999f). Research in Motion signs agreement with leading law firm to supply BlackBerry wireless solution, *Canada NewsWire*.

Anonymous. (2001a). The new economy: Myth and reality. *Monthly Review, 52*(11), 1-15.

Anonymous. (2001b, March 4). RIM introduces java-based BlackBerry handheld with integrated phone for GSM/GPRS networks in North America, *PR Newswire*.

Anonymous. (2007, December 21). Smartphones like BlackBerry give rise to the "prosumer," *Mobile Marketer*.

Anonymous. (2010, December 2). BlackBerry overtakes Apple in mobile Internet usage in US, *Telecom Paper*.

Apple. (1994). *Annual report*. Washington, D.C.

Apple. (1998). *Annual report.* Washington, D.C.

Arminen, Ilkka. (2009). Intensification of time-space geography in the mobile era. In Richard

Seyler Ling & Scott W. Campbell (Eds.), *The reconstruction of space and time: Mobile communication practices* (pp. 89-108). New Brunswick, N.J.: Transaction Publishers.

Arnquist, Sarah. (2009, October 5). In rural Africa, a fertile market for mobile phones, *The New York Times*.

Aronowitz, Stanley. (2000). *The knowledge factory: Dismantling the corporate university and creating true higher learning*. Boston, Mass.: Beacon Press.

Arthur, Charles. (2006, February 9). Survival of the unfittest, *The Guardian*. Retrieved from http://www.guardian.co.uk/technology/2006/feb/09/guardianweeklytechnologysection

Arthur, Charles. (2011, July 1). Nortel patents sold for $4.5bn, *The Guardian*. Retrieved from http://www.guardian.co.uk/technology/2011/jul/01/nortel-patents-sold-apple-sony-microsoft

Arvidsson, Adam. (2006). *Brands: Meaning and value in media culture*. New York: Routledge.

Associated Press. (2009, September 24). RIM shares fall 11% on earning decline, *The New York Times*.

Associated Press. (2010, August 1). Two mideast states say they will block BlackBerry, *The New York Times*.

Atkinson, Robert D. (2000). Myths of the new economy getting the parameters of change right. *New Economy, 7*(1), 54-58.

Ausband, Stephen C. (1983). *Myth and meaning, myth and order*. Macon, Ga.: Mercer University Press.

Austen, Ian. (2000, April 13). A new BlackBerry pager allows longer e-mail, *New York Times*.

Austen, Ian. (2006, Septemer 18). BlackBerry adds diversions, counting on sales, *New York Times*. Retrieved from http://www.nytimes.com/2006/09/18/technology/18rim.html

Austen, Ian. (2007, February 13). Can executives find happiness with a BlackBerry minus its scroll wheel?, *The New York Times*.

Babe, Robert. (2006a). The political economy of knowledge: Neglecting political economy in the age of fast capitalism (as before). *Fast Capitalism, 2*(1).

Babe, Robert. (2006b). *Culture of ecology*. Toronto: University of Toronto Press.

Babe, Robert E. (1990). *Telecommunications in Canada: Technology, industry, and government*. Toronto: University of Toronto Press.

Bacon, Francis. (1620). The new organon. In Graham Rees (Ed.). *The Oxford Francis Bacon* (Vol. 11). Oxford: Clarendon Press. 2004.

Baig, Edward. (2010, August 5). Hottest part of Torch is BlackBerry 6 software; new operating system works out some of the kinks in RIM smartphones, *USA Today*.

Bajaj, Vikas. (2010, August 12). India warns it will block BlackBerry traffic that it can't monitor, *The New York Times*. Retrieved from http://www.nytimes.com/2010/08/13/technology/13rim.html

Baker, Fred. (2000, December 5). Let freedom ring, *Intelligent Enterprise, 3*(18).

Baker, Richard H. (1994). *Networking the enterprise: How to build client/server systems that work*. New York: McGraw-Hill.

Ball, Laurence, & Tchzaide, Robert. (2002). The Fed and the new economy. *American Economic Review, 92*, 108-114.

Bardini, Thierry. (2000). *Bootstrapping: Douglas Engelbart, coevolution, and the origins of personal computing*. Stanford, Calif.: Stanford University Press.

Barney, Darin. (2000). *Prometheus wired: The hope for democracy in the age of network technology*. Chicago: University of Chicago Press.

Barney, Darin (2004). *The network society*. Oxford: Polity Press.

Bathelt, Harald, Kogler, Dieter F., & Munro, Andrew K. (2010). A knowledge-based typology of university spin-offs in the context of regional economic development. *Technovation, 30*(1), 519-532.

Baugh, Elaine. (1993, June). An open letter to President Bill. *Communications*, 30(6), p. 6.

Bauman, Zygmunt. (2007). *Consuming life*. Cambridge, UK ; Malden, MA: Polity Press.

Beaudouin-Lafon, Michel. (1999). *Computer supported co-operative work*. New York: Wiley.

Bell, Andrew. (2000, September 26). RIM shares continue climb on pager popularity, *The Globe and Mail,* p. B20.

Bell, Daniel. (1976). *The coming of post-industrial society: A venture in social forecasting*. New York: Basic Books.

Beniger, James R. (1986). *The control revolution: Technological and economic origins of the information society*. Cambridge, Mass.: Harvard University Press.

Benkler, Yochai. (2006). *The wealth of networks: How social production transforms markets and freedom*. New Haven: Yale University Press.

Bernard, Andre. (2009). Trends in manufacturing employment. Ottawa: Statistics Canada.

Bernard, Tara Siegel, & Miller, Claire Cain. (2011, May 24). Swiping is the easy part, *The New York Times*.

Best, Beverley. (2010). *Marx and the dynamic of the capital formation: An aesthetics of political economy*. New York: Palgrave Macmillan.

Biggs, John. (2008, September 17). A BlackBerry for those who don't want to look like BlackBerry users, *The New York Times*.

Birchall, D. W., & Lyons, Laurence. (1995). *Creating tomorrow's organization: Unlocking the benefits of future work*. London: Pitman Pub.

Blake, Pat. (1993, October). Cellular delivers real-time tracking to ups. *Cellular Business, 10*.

Blakely, Rhys. (2007, May 3). New BlackBerry chases the 'prosumer' market. *The Times*.

Bock, Geoffrey, & Marca, David. (1995). *Designing groupware: A guidebook for designers, implementors, and users*. New York: McGraw Hill.

Bogost, Ian. (2011, August 9). Gamification is bullshit. *The Atlantic*.

Boltanski, Luc, & Chiapello, Eve. (2005). *The new spirit of capitalism*. New York: Verso.

Bonnington, Christina. (2012, March 23). Congress queries app developers on their data privacy practices. *Wired*.

Borghoff, Uwe M., & Schlichter, Johann H. (2000). *Computer-supported cooperative work: Introduction to distributed applications*. New York: Springer.

Boudette, Neal, & Cortese, Amy. (1993, March 1). Intel, Microsoft ramp up PDA design efforts: 'Winpad' hardware, software to challenge early mobile leaders. *PC Week, 10*.

Bourdieu, Pierre. (1990). *The logic of practice*. Cambridge: Polity.

boyd, danah, & Crawford, Kate. (2012). Critical questions for big data. *Information, Communication & Society, 15*(5), 662-679.

Bramwell, Allison, & Wolfe, David A. (2008). Universities and regional economic development: The entrepreneurial University of Waterloo. *Research Policy, 37*(8), 1175-1187.

Brander, James A., Egan, Edward, & Hellmann, Thomas F. (2008). Government sponsored versus private venture capital: Canadian evidence. Cambridge, Massachusetts: National Bureau of Economic Research.

Braverman, Harry. (1974). *Labor and monopoly capital: The degradation of work in the twentieth century*. New York: Monthly Review Press.

Breece, Marcia. (1999, November 1). A perfect blend. *Wireless Review*.

Bresnahan, Timothy F., & Gambardella, Alfonso. (2004). *Building high-tech clusters: Silicon Valley and beyond*. New York: Cambridge University Press.

Brodsky, Ira. (1990). Wireless data networks and the mobile workforce. *Telecommunications, 24*(12).

Brown, Jennifer. (2003). SMB a harder sell: Analyst says. *Computer Dealer News, 19*.

Buckley, Sandra. (2010). Intimate strangers: The *keitai* culture of 'belonging-without-being-with'. In Barbara Crow, Michael Longford & Kim Sawchuk (Eds.), *The wireless spectrum*. Toronto: University of Toronto Press.

Bulik, Beth. (2004, November 15). BlackBerry's latest offers taste to regular consumers: But must take care not to go sour on execs. *Advertising Age, 75,* 8.

Burnett, Judith, Senker, Peter, & Walker, Kathy. (2009). *The myths of technology: Innovation and inequality*. New York: Peter Lang.

Butcher, Mike. (2011, August 11). "Absolute explosion"--how BlackBerry BBM fed the riots, says contact. *TechCrunch.* Retrieved from http://techcrunch.com/2011/08/11/absolute-explosion-how-blackberry-bbm-fed-the-riots-says-contact/

Butter, Andrea, & Pogue, David. (2002). *Piloting Palm: The inside story of Palm, Handspring, and the birth of the billion-dollar handheld industry*. New York: John Wiley & Sons.

Caffentzis, George. (2011). A critique of "cognitive capitalism." *Unpublished*.

Calem, Robert E. (1992, November 8). Technology; look, no wires but pages fly, *The New York Times*. Retrieved from http://www.nytimes.com/1992/11/08/business/technology-look-no-wires-but-the-pages-fly.html?n=Top%2fReference%2fTimes%20Topics%2fSubjects%2fT%2fTelephones%20and%20Telecommunications

Campbell, Fred. (2012, July 26). Why conservatives must heed congressman Issa's call. *The Atlantic*.

Campbell, Joseph. (1990). *Transformations of myth through time*. New York: Harper & Row.

Canadian Labour Congress, & Social Economic Policy Department. (1993). The myth of the "new economy": "Positive restructuring" in manufacturing: A report: Social and Economic Policy Department, Canadian Labour Congress. Ottawa.

Canton, Alan N. (1994). BPR: The arguments every CIO hears. *Information Systems Management, 11*(2), 87-89.

Carayannopoulos, Sofy. (2005). Research in Motion: A small firm commercializing a new technology. *Entrepreneurship Theory and Practice* (March).

Carey, James W. (1992). *Communication as culture: Essays on media and society*. New York: Routledge.

Carlton, Jim. (1997). *Apple: The inside story of intrigue, egomania, and business blunders* (1st ed.). New York: Times Business/Random House.

Carr, Nicholas. (2008, July/August). Is Google making us stupid? *The Atlantic*.

Carr, Nicholas. (2010). *The shallows: What the Internet is doing to our brains*. New York: W. W. Norton Company.

Castells, Manuel. (1996). *The rise of the network society*. Cambridge, Mass.: Blackwell Publishers.

Castells, Manuel. (2004). *The network society: A cross-cultural perspective*. Northampton, MA: Edward Elgar Pub.

Castells, Manuel. (2007). *Mobile communication and society: A global perspective: A project of* *the Annenberg research network on international communication*. Cambridge, Mass.: MIT Press.

Castells, Manuel, Cardoso, Gustavo, & Paul H. Nitze School of Advanced International Studies. Center for Transatlantic Relations. (2006). *The network society: From knowledge to policy*. Washington, DC: Center for Transatlantic Relations, Paul H. Nitze School of Advanced International Studies, Johns Hopkins University.

Cavoukian, Ann. (2012). Privacy by design and the emerging personal data ecosystem *Privacy By Design*. Toronto, Ontario: Information and Privacy Commissioner.

Century, Douglas. (2001, January 14). A world divide into two-way pager camps, *New York Times*.

Cervenan, Amy. (2009). Service class prosperity in Ontario *Ontario in the Creative Age*. Toronto: Martin Prosperity Institute.

Chaffey, Dave. (1998). Groupware, workflow, and intranets reengineering the enterprise with collaborative software (pp. xiii, 264 p.).

Chamberlain, Woodrow W. (1993, Sep/Oct). CIO, reengineer thyself. *Chief Information Officer Journal, 5*.

Chandler, Alfred D., & Cortada, James W. (Eds.). (2000). *A nation transformed by information: How information has shaped the United States from colonial times to the present*. New York: Oxford University Press.

Chase, Steven. (2000). BlackBerry season, *The Globe and Mail,* p. T01.

Chen, Brian X. (2013, January 11). Smartphones becomes life's remote control, *The New York Times*. Retrieved from http://www.nytimes.com/2013/01/12/technology/smartphones-can-now-run-consumers-lives.html?smid=tw-share&_r=0

Chen, Brian X. (2013, January 11). Smartphones becomes life's remote control, *The New York Times*.

Cheney-Lippold, John. (2011). A new algorithmic identity: Soft biopolitics and the modulation of control. *Theory, Culture, Society, 28*(6), 164-181.

Cheng, Jacqui. (2011, July 18). iOS, Android catching buyers' eyes while BlackBerry suffers, *The Wall Street Journal*. Retrieved from http://arstechnica.com/apple/2011/07/ios-android-catching-buyers-eyes-while-blackberry-suffers/

Cheng, Jacqui. (2011, May 10). Senators press Apple, Google for answers about location tracking, *Ars Technica*. Retrieved from http://arstechnica.com/apple/2011/05/senators-press-apple-google-for-answers-about-location-tracking/

Cheng, Roger. (2009, April 1). RIM launches BlackBerry app store, *The Wall Street Journal*.

Chu, Showwei. (2000, November 28). Personal storage services will transform BlackBerry device, free users: Chairman, *The Globe and Mail,* p. B09.

Chu, Showwei. (2001a, July 12). RIM adopts Java for its handhelds, *The Globe and Mail,* p. B04.

Chu, Showwei. (2001b, January 16). RIM extends reach of market for BlackBerry devices, *The Globe and Mail,* p. B18.

Churchill, Jason Lemoine. (2006). *The limits to influence: The club of Rome and Canada, 1968 to 1988.* University of Waterloo, Waterloo. Retrieved from http://uwspace.uwaterloo.ca/bitstream/10012/747/1/jlchurch2006.pdf

Cisco. (2012). Cisco visual networking index: Global mobile data traffic forecast update, 2011-2016: Cisco.

Clemons, David, & Kroth, Michael S. (2011). *Managing the mobile workforce: Leading,*

building, and sustaining virtual teams. New York: McGraw-Hill.
Cohen, G.A. (1972). Karl Marx and the withering away of social science. *Philosophy & Public Affairs,* 1(2), 182-203.
Cohn, Michael. (2002, May). Like money in your hand. *Internet World, 8,* 54-55.
Colapinto, John. (2011, October 3). Famous names: Does it matter what a product is called? *The New Yorker*.
Cole, Trevor. (2000, March 31). The speed of light, *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/report-on-business/rob-magazine/the-speed-of-light/article4162246/?page=all
Coleman, David, & Khanna, Raman. (1995). *Groupware: Technologies and applications*. Upper Saddle River, NJ: Prentice Hall PTR.
Common Cause. (2005). The fallout from the Telecommunications Act of 1996: Unintended consequences and lessons learned. Washington, D.C.: Common Cause Education Fund.
Comor, Edward. (1998). *Communication, commerce, and power: The political economy of america and the direct broadcast satellite, 1960-2000*. Houndmills, Basingstoke, Hampshire: Macmillan.
Comor, Edward. (2001). Harold Innis and "the bias of communication." *Information, Communication, and Society, 4*(2), 274-294.
Comor, Edward. (2002). When more is less: Time, space and knowledge in information societies. In Robin Mansell, Rohan Samarajiva & Amy Mahan (Eds.), *Networking knowledge for information societies: Institutions and interventions*. The Netherlands: DUP Science.
Comor, Edward. (2011). Contextualizing and critiquing the fantastic prosumer: Power, alienation and hegemony. *Critical Sociology, 37*(3), 209-327.
Confederation, European Trade Union. (2002). Voluntary agreement on telework.
Conforti, Justin. (2009). Somebody's watching me: Workplace privacy interests, technology surveillance, and the ninth circuit's misapplication of the Ortega test in Quon v. Arch wireless. *Seton Hall Circuit Review, 5*(2), 1-36.
Connors, Will. (2011, October 25). RIM boosts drive to lure more BlackBerry apps, *The Wall Street Journal*. Retrieved from http://online.wsj.com/article/SB10001424052970203752604576645183134355622.html
Connors, Will. (2012, May 24). Fate of BlackBerry's popular messaging tool in doubt, *The Wall Street Journal*. Retrieved from http://online.wsj.com/article/SB10001424052702303505504577406342008454230.html
Cowhey, Peter F., Aronson, Jonathan D., & Richards, John E. (2008). The peculiar evolution of 3G wireless networks: Institutional logic, politics, and property rights In William J. Drake & Ernest J. Wilson III (Eds.), *Governing global electronic networks*. Cambridge, Mass.: MIT Press.
Crawford, Kate, & Goggin, Gerard. (2008). Handsome devils: Mobile imaginings of youth culture. *Global Media Journal: Australian Edition*, *1*(1), 1-12.
Cringley, Robert. (1993, September 13). Who, what and why of wireless. *Forbes*.
Crow, Barbara, Longford, Michael , & Sawchuk, Kim (Eds.). (2010). *The wireless spectrum: The politics, practices, and poetics of mobile media*. Toronto: University of Toronto.
Cuneo, Alice Z. (2007). Pimp your Facebook profile anytime, anywhere: Social net introduces new mobile software for BlackBerry. *Advertising Age*.
Davenport, Thomas H., & Beck, John C. (2001). *The attention economy: Understanding the new*

currency of business. Boston: Harvard Business School Press.
David, Peter. (1997). Inside the knowledge factory. *The Economist, 345,* S3-5.
David, P.A. (1985). Clio and the economics of QWERTY. *American Economic Review, 75*, 332-337.
Davidow, Bill. (2012, July 18). Exploiting the neuroscience of Internet addiction. *The Atlantic*.
Davidow, William H., & Malone, Michael S. (1992). *The virtual corporation: Structuring and revitalizing the corporation for the 21st century* (1st ed.). New York: Edward Burlingame Books/HarperBusiness.
Deloitte. (2006). Convergence conversations. Deloitte.
Deloitte. (2008). The promise of open mobile: Capturing value in a brave new world. Deloitte.
Depres, Remi. (2010). X.25 virtual circuits - Transpac in France - pre-Internet data networking [history of communications]. *Communications Magazine, IEEE, 48*(11), 40-46.
Dewar, Tammy. (2006). Virtual teams--virtually impossible? *Performance Improvement, 45*(5), 22-25.
Didner, Bengt. (1991). Data goes mobile. *Telephony, 220*(10).
Diercks, Rebecca. (2002, July 1). E-mail: Still the killer messaging app. *Wireless Internet Magazine,* 24.
Dmitrienko, Iain Alexander. (1999). *The Waterloo Plan: The University of Waterloo and the introduction of co-operative education in Canada*. Waterloo: University of Waterloo.
Donaldson, Rob. (1993). Paging explosion: Beeper industry reaps $2.2 billion in revenues. *St. Louis Business Journal,* 13.
Dresner, Howard. (2008). *The performance management revolution: Business results through insight and action*. Hoboken, N.J.: John Wiley & Sons.
Drucker, Peter F. (2010). *Toward the next economics and other essays*. Boston, Mass.: Harvard Business Press.
Drucker, Peter F., & Wartzman, Rick. (2010). *The Drucker lectures: Essential lessons on management, society and economy*. New York: McGraw-Hill Professional.
du Gay, Paul, Hall, Stuart , Janes, Linda, Mackay, Hugh, & Negus, Keith. (1997). *Doing cultural studies: The story of the Sony Walkman*: Sage.
Duhigg, Charles, & Barboza, David. (2012, January 25). In China, human costs are built into an iPad, *The New York Times*.
Duhigg, Charles, & Bradsher, Keith. (2012, January 21). How the U.S. Lost out on iPhone work, *The New York Times*. Retrieved from http://www.nytimes.com/2012/01/22/business/apple-america-and-a-squeezed-middle-class.html?pagewanted=all
Duhigg, Charles, & Lohr, Steve. (2012, October 7). The patent, used as a sword, *The New York Times*. Retrieved from http://www.nytimes.com/2012/10/08/technology/patent-wars-among-tech-giants-can-stifle-competition.html?pagewanted=all&_r=0
Dyer-Witheford, Nick. (1999). *Cyber-Marx: Cycles and circuits of struggle in high-technology capitalism*. Urbana: University of Illinois Press.
Dyson, Esther, Gilder, George, Keyworth, George, & Toffler, Alvin. (1994). Cyberspace and the American dream: A Magna Carta for the knowledge age. *Future Insight, 1*(2).
Eagleton, Terry. (2007). *Ideology: An introduction* ([2007 ed.). London, UK ; New York: Verso.
Easton, Jaclyn. (2002). *Going wireless: Transform your business with mobile technology*. New York: HarperBusiness.
Eavis, Peter. (2008, June 25). Rim enters risky arena---BlackBerrys move beyond business;

fickle consumers, *The Wall Street Journal*.
Ebrahim, Nader Ale, Ahmed, Shamasuddin, & Taha, Zahari. (2009). Virtual R&D teams in small and medium enterprises: A literature review. *Scientific Research and Essays, 4*(13), 1575-1590.
Eckersley, Peter. (2011). Some facts about Carrier IQ. Retrieved from https://www.eff.org/deeplinks/2011/12/carrier-iq-architecture
Eckerson, Wayne. (1992, April 6). Emerging wireless services promise to set workers free. *Network World, 9*.
Editors. (2001). The new economy: Myth and reality. *Monthly Review*.
Edward, Morris. (1993, July). Leaders vie for position in mobile computing. *Communications News, 30*.
Edwards, Morris. (1992, November). Industry prepares for global marketing. *Communications News, 29*.
Edwards, Morris. (1998, June). Wireless internet isn't here yet--but it's coming. *Communications News, 35*.
Elkin, Tobi. (2001). BlackBerry: Mark guibert. *Advertising Age, 72*(41).
Emmerson, Bob. (1996). Working from anywhere. *Communications International, 23*(2).
Enzensberger, Hans Magnus, & Roloff, Michael. (1974). *The consciousness industry: On literature, politics and the media*. New York: Seabury Press.
Ericsson. (2012). Traffic and market report: On the pulse of the networked society. Ericsson.
Evans, Dave. (2011). The Internet of things: How the next evolution of the Internet is changing everything: Cisco, Internet Business Solutions Group.
Evans, Jon. (2012, June 9). In five years, most Africans will have smartphones. *TechCrunch*. Retrieved from http://techcrunch.com/2012/06/09/feature-phones-are-not-the-future/
Fagerberg, Jan, Mowery, David C., & Verspagen, Bart. (2009). *Innovation, path dependency and policy: The Norwegian case*. New York: Oxford University Press.
Faigen, George S., Fridman, Boris, & Emmett, Arielle. (2002). *Wireless data for the enterprise: Making sense of wireless business*. New York: McGraw-Hill.
Fayle, Kevin. (2009, April 1). BlackBerry launches software store to compete with Apple's iPhone app store, *Thomson Reuters*.
FCC. (1997). The FCC report to congress on spectrum auctions. Washington, D.C.: Federal Communications Commission.
Featherstone, Mike. (2009). Ubiquitous media: An introduction. *Theory, Culture & Society, 26*(2-3), 1-22.
Fierheller, George A. (2010). *Wireless in wonderland: Canadians cut the cord: Cantel 1983-1993*. Markham, Ont.: Stewart Pub.
Firth, Lucy, & Mellor, David. (1999). The impact of regulation on innovation. *European Journal of Law and Economics, 8*, 199-205.
Fitchard, Kevin. (2012, March 20). Data now 85% of mobile traffic but 39% of revenue: What gives? Retrieved from http://gigaom.com/2012/03/20/data-now-85-of-mobile-traffic-but-39-of-revenue-what-gives/
Fitzpatrick, Tony. (2002). Critical theory, information society and surveillance technologies. *Information, Communication & Society, 5*(3), 357-378. doi: 10.1080/13691180210159300
Flichy, Patrice. (2007). *Understanding technological innovation: A socio-technical approach*. Cheltenham, UK ; Northampton, MA: Edward Elgar.

Florida, Richard L. (2004). *The rise of the creative class: And how it's transforming work, leisure, community and everyday life*. New York, NY: Basic Books.

Florida, Richard L., Gertler, Meric S., Gates, Gary, & Vinodrai, Tara. (2002). Competing on creativity: Placing Ontario's cities in North American context: Ontario Ministry of Enterprise, Opportunity and Innovation and the Institute for Competitiveness and Prosperity.

Florida, Richard L., & Martin, Roger. (2009). Ontario in the creative age. Toronto: Martin Prosperity Institute, University of Toronto.

Flynn, Laurie J. (2007, March 26). Maker of mobile games brings line to BlackBerry, *New York Times*. Retrieved from http://www.nytimes.com/2007/03/26/technology/26game.html

Foerst, Anne. (2005). Artificial intelligence and theology: From mythos to logos and back. In Stefano Franchi & Guven Guzeldere (Eds.), *Mechanical bodies, computational minds: Artifical intelligence from automata to cyborgs* (pp. 489-514). Cambridge, Mass.: The MIT Press.

Fogarty, Timothy, Magman, Michel, Markarian, Garen, & Bohdjalian, Serge. (2009). Inside agency: The rise and fall of Nortel. *Journal of Business Ethics, 84*(2), 165-187.

Foggin, Nick. (2005). Mythology and mobile data. In Peter Glotz, Stefan Bertschi & Chris Locke (Eds.), *Thumb culture: The meaning of mobile phones for society* (pp. 251-260). Bielefeld: Transcript.

Foresman, Chris. (2010). How Star Trek artists imagined the iPad... 23 years ago. *Ars Technica*. Retrieved from http://arstechnica.com/apple/news/2010/08/how-star-trek-artists-imagined-the-ipad-23-years-ago.ars/1

Fortunati, Leopoldina. (2002). The mobile phone: Towards new categories and social relations. *Information, Communication, and Society, 5*(4), 513-528.

Fortunati, Leopoldina. (2003). Mobile phone as technological artifact. *Information, Communication, and Society*.

Fortunati, Leopoldina. (2005). The mobile phone as technological artefact. In Peter Goltz, Stefan Bertschi & Chris Locke (Eds.), *Thumb culture: The meaning of mobile phones for society*. Piscataway, NJ: Transcript.

Foust, Dean. (1997, July 14). Alan Greenspan's brave new world. *BusinessWeek*.

Franklin, Seb. (2012). Cloud control, or the network as medium. *Cultural Politics, 8*(3), 442-464.

Fransman, Martin. (1986). *Technology and economic development*. Boulder, Colo.: Westview Press.

Fransman, Martin. (2002). *Telecoms in the Internet age: From boom to bust to...?* Oxford; New York: Oxford University Press.

Fransman, Martin. (2010). *The new ICT ecosystem: Implications for policy and regulation*. New York: Cambridge University Press.

Fraser, Robert. (1991, July). The Mobitex terminal specification. *Communications*.

Freeman, Harrell. (1992). Will paging survive? *Communications, 29*(9), 74-74.

Freeman, John. (2009). *The tyranny of e-mail: The four-thousand-year journey to your inbox* (1st Scribner hardcover ed.). New York: Scribner.

Friedman, Milton. (2007). *Price theory*. New Brunswick, NJ: Transaction Publishers.

Fuchs, Christian. (2009). Information and communication technologies and society: A contribution to the critique of the political economy of the Internet. *European Journal of Communication, 24*(69), 69-87.

Fuchs, Gerhard, & Shapiro, Philip (Eds.). (2005). *Rethinking regional innovation change: Path* *dependency or regional breakthrough?* New York: Springer.

Fukuyama, Francis. (1992). *The end of history and the last man*. Toronto: Free Press.

Fukuyama, Francis, Shulsky, Abram N., United States. Army., Arroyo Center., & Rand Corporation. (1997). *The "virtual corporation" and army organization*. Santa Monica, CA: Rand.

Gallagher, Julie. (2002, October). Road map to connectivity. *Insurance & Technology, 27*.

Gallagher, Leigh. (2000, November 27). Black berry-or black eye? *Forbes, 166,* 265-266.

Gandal, Neil, Salant, David, & Waverman, Leonard. (2003). Standards in wireless telephone networks. *Telecommunications Policy, 27*, 325-332.

Garnham, Nicholas. (1998). Information society theory as ideology. *Loisir et Societe, 21*(1), 97-120.

Gartner. (2012a). Gartner says worldwide smartphone sales soared in fourth quarter of 2011 with 47 percent growth: Gartner Research.

Gartner. (2012b). Gartner says worldwide it spending on pace to surpass $3.6 trillion in 2012. Stamford, Conn.: Gartner Research.

Gaudin, Sharon. (2011, July 26). Internet as hard to give up as cigarettes, liquor, study says. *Computerworld*.

Gaudin, Sharon. (2012, September 17). Smartphones and tablets may be making you sleepless, fat and sick. *Computerworld*.

Georgakopoulos, Dimitrios, Schuster, Hans, Cichocki, Andrzej, & Baker, Donald. (1999). Managing process and service fusion in virtual enterprises. *Information Systems, 24*(6), 429-456.

Georgetown University Law Center. (2010). Workplace flexibility 2010. Washington, D.C.: Georgetown University Law Center.

Gergen, Kenneth. (2008). Mobile communication and the transformation of democratic process. In James Katz (Ed.), *Handbook of mobile communications studies*. Cambridge, Massachusetts: The MIT Press.

Gibson, Ellen. (2011, July 26). Psychologists concerned about smartphone 'obsession'. *Huffington Post.* Retrieved from http://www.huffingtonpost.com/2011/07/26/smarpthone-obsession_n_909462.html

Gillin, Paul. (2008). Mobile social network: The new ecosystem *ComputerWorld Communications Brief*.

Gillott, Iain. (2002). The business case for wireless software applications in the enterprise. *Software Magazine,* 56-62.

Glotz, Peter, Bertschi, Stefan, & Locke, Chris. (2005). *Thumb culture: The meaning of mobile phones for society*. Bielefeld: Transcript.

Goggin, Gerard. (2006). *Cell phone culture: Mobile technology in everyday life*. New York, NY: Routledge.

Goggin, Gerard. (2008). *Mobile phone cultures*. London: Routledge.

Goggin, Gerard. (2011). *Global mobile media*. London ; New York: Routledge.

Goggin, Gerard, & Hjorth, Larissa. (2009). *Mobile technologies: From telecommunications to media*. New York: Routledge.

Goldberg, Aaron. (1993, May 31). Why you'll soon see more wireless LANs. *PC Week, 10*.

Goldman, Chris. (2000). The wireless workplace. *Wireless Review, 17,* 15-20.

Goldman, Robert, Papson, Stephen, & Kersey, Noah. (2006). Landscapes of the social relations of production in a networked society. *Fast Capitalism, 2*(1).

Gowdy, John M., & Walton, Marsha. (2003). Consumer sovereignty, economic efficiency and the trade liberalisation debate. *International Journal of Global Environmental Issues, 3*(1), 1-13.

GPO. (1993). Remarks at a communications technology demonstration. Washington, D.C.: Government Printing Office Retrieved from http://www.gpo.gov/fdsys/pkg/WCPD-1993-07-26/html/WCPD-1993-07-26-Pg1418.htm.

Graham, Jefferson. (2009, October 13). Slacker gets busy on BlackBerrys. *USA Today*.

Granatstein, Lisa, & Moses, Lucia. (2006). Time for letting go. *Media Week*, 16, 4-5.

Grantham, Charles, & Ware, Jim. (2009). Flexible work arrangements for nonexempt employees. Scottsdale, Arizona: WorldatWork Research.

Greenberg, Paul. (2001). *CRM at the speed of light: Capturing and keeping customers in internet real time*: McGraw-Hill Professional.

Grenier, Ray, & Metes, George. (1995). *Going virtual: Moving your organization into the 21st century*. Upper Saddle River, N.J.: Prentice Hall.

Grimshaw, David J., & Kwok, F.T. Sandy. (1998). The business benefits of the virtual organization. In Magid Igbaria & Margaret Tan (Eds.), *The virtual workplace*. London: Idea Group Publishing.

Grossman, Lev. (2006). Power to the people. *Time Magazine, 168*(26).

Gupta, Sunil, Hanssens, Dominique, Hardie, Bruce, Kahn, William, Kumar, V., Lin, Nathaniel, & Sriram, Nalini Ravishanker S. (2006). Modeling customer lifetime value. *Journal of Service Research, 9*(2), 139-155.

Gurstein, Penny. (2001). *Wired to the world, chained to the home: Telework in daily life*. Vancouver: UBC Press.

Guth, Robert A., & Vascellaro, Jessica E. (2007, October 23). Business technology: Why Microsoft, RIM fight is entering the consumer market, *The Wall Street Journal*.

Haigh, Thomas. (2003). *Technology, information and power: Managerial technicians in corporate America, 1917-2000.* Ph.D., University of Pennsylvania, Philadelphia.

Haigh, Tom. (2009). *How the computer became information technology: Constructing information in corporate America, 1950-2000*. University of Wisconsin - Milwaukee. Retrieved from www.tomandmaria.com/tom/writing/InfoFixDRAFT.pdf

Hall, James. (2010, August 3). Future is no longer so sweet for BlackBerry. *The Telegraph*. Retrieved from http://www.telegraph.co.uk/technology/blackberry/7922936/Future-is-no-longer-so-sweet-for-BlackBerry.html

Hall, Stuart (Ed.). (1991). *Culture, media, language: Working paper in cultural studies, 1972-1979*: Routledge.

Hallerman, David. (1993). Newton falls short. *Home Office Computing, 11*(11), 54-54.

Halliday, Josh. (2011, August 8). London riots: BlackBerry to help police probe messenger looting 'role', *The Guardian*. Retrieved from http://www.guardian.co.uk/uk/2011/aug/08/london-riots-blackberry-messenger-looting

Hamblen, Matt. (2008, May 14). The BlackBerry: In search of the 'prosumer'. *Computerworld*.

Hammer, Michael. (1990). Reengineering work: Don't automate, obliterate. *Harvard Business Review*(July-August), 104-112.

Handy, C. (1995). Trust and the virtual organization. *Harvard Business Review, May-June*, 40-50.

Hansell, Saul, & Austen, Ian. (2009, October 13). BlackBerry, upgraded, aims to suit every user, *The New York Times*.

Harmon, Amy. (2000, September 21). E-mail you can't outrun, *New York Times*.
Harvey, David. (1989). *The condition of postmodernity: An enquiry into the origins of cultural change*. New York, NY: Blackwell.
Harvey, David. (2005). *A brief history of neoliberalism*. Oxford ; New York: Oxford University Press.
Harvey, David. (2006). *The limits to capital* (New and fully updated ed.). London, UK ; New York: Verso.
Harvey, David. (2010). *The enigma of capital: And the crises of capitalism*. New York: Oxford University Press.
Hassan, Robert, & Purser, Ronald (Eds.). (2007). *24/7: Time and temporality in the network society*: Stanford University Press.
Hawryszkiewycz, I. T. (1997). *Designing the networked enterprise*. Boston: Artech House.
Hayek, Friedrich A., Pierson, N. G., Von Mises, Ludwig, Halm, George Nikolaus, & Barone, Enrico. (1956). *Collectivist economic planning; critical studies on the possibilities of socialism*. London: G. Routledge & Sons.
Healy, Beth. (2000, July 13). Entrepreneurs grab latest handheld technology, *The Globe and Mail,* p. T05.
Heidegger, Martin. (1977). *The question concerning technology, and other essays* (1st ed.). New York: Harper & Row.
Heinrich, Michael. (2012). *An introduction to the three volumes of Karl Marx's Capital* (Alexander Locascio, Trans.). New York: Monthly Review Press.
Heinzl, Mark. (2003, November 13). Growing BlackBerry's overseas--Research in Motion looks abroad to expand use of e-mail tool, *Wall Street Journal,* p. B3.
Helliwell, John. (1989, July 24). Wireless LANs: Coming to an office near you? *PC Week, 6*.
Hendricks, John Allen. (1999). The telecommunications act of 1996: Its impact on the electronic media of the 21st century[*]. [Article]. *Communications & the Law, 21*(2), 39.
Hengel, Gene. (1994, November 7). Cellular communication key to mobile workforce. *National Underwriter, 98*.
Hesselbein, Frances, Goldsmith, Marshall, Beckhard, Richard, & Peter F. Drucker Foundation for Nonprofit Management. (1997). *The organization of the future* (1st ed.). San Francisco, Calif.: Jossey-Bass Publishers.
Hirschheim, R. A. (1985). *Office automation: Concepts, technologies, and issues*. Wokingham, England ; Don Mills, Ont.: Addison-Wesley Pub. Co.
Hirschheim, R. A., Dibbern, Jens, Heinzl, Armin, & SpringerLink (Online service). (2009). Information systems outsourcing enduring themes, global challenges, and process opportunities   Retrieved from https://www.lib.uwo.ca/cgi-bin/ezpauthn.cgi?url=http://dx.doi.org/10.1007/978-3-540-88851-2
Hobijn, Bart, & Jovanovic, Boyan. (2000). The information technology revolution and the stock market: Evidence. Cambridge, MA: National Bureau of Economic Research.
Hofkirchner, Wolfgang. (2013). *Emergent information a unified theory of information framework.* London: World Scientific Publishing Company.
Horowitz, Alan S. (1998, June 15). PalmPilots break out. *InformationWeek.*
Howitt, Chuck. (2013, January 30). RIM adopts BlackBerry as official company name. *The Record.*
Hundt, Reed. (1997). *Spectrum policy and auctions: What's right, what's left*. Washington, D.C.: Retrieved from http://transition.fcc.gov/Speeches/Hundt/spreh734.html.

Hunter, Doug. (2002). *The bubble and the bear: How Nortel burst the Canadian dream*. Toronto: Doubleday Canada.
Huws, Ursula, Dahlmann, Simone, Flecker, Jorg, Ramioul, Monique, & Geurts, Karen. (2009). Value chain restructuring in Europe in a global economy. Leuven: Katholieke Universiteit Leuven.
Huws, Ursula, Korte, Werner B., Robinson, Simon, & Empirica Wirtschafts- und Sozialwissenschaftliche Forschungs- und Beratungsgesellschaft. (1990). *Telework: Towards the elusive office*. Chichester, England ; Toronto: Wiley.
Huws, Ursula, & Leys, Colin. (2003). *The making of a cybertariat: Virtual work in a real world*. London: Merlin.
IBM. (2009). Global businesses choosing lotus software; more than half of Fortune Global 100 now using Lotus Notes/Domino. Armonk, NY: IBM.
IDC. (2012a). Android expected to reach its peak this year as mobile phone shipments slow, according to IDC. Framingham, Mass.: IDC.
IDC. (2012b). IDC raises its worldwide tablet forecast on continued strong demand and forthcoming new product launches. Framingham, Mass.: IDC.
Igbaria, Magid, & Tan, Margaret. (1998). *The virtual workplace*. Hershey, PA: Idea Group Pub.
Illegems, Viviane, & Verbeke, Alain. (2003). *Moving towards the virtual workplace: Managerial and societal perspectives on telework*. Cheltenham, UK; Northhampton, MA: Edward Elgar Publishing.
Immen, Wallace. (2013, February 6). Mobile workers are the 'new norm,' *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/report-on-business/careers/the-future-of-work/mobile-workers-are-the-new-norm/article8295535/
Industry Canada. (2004). Canadian venture capital activity: An analysis of trends and gaps (Industry Canada, Trans.). Ottawa: Industry Canada.
Ingram, Mathew. (2000, March 4). Will competition clip RIM's wings? *The Globe and Mail,* p. N04.
Innis, Harold Adams. (1964). *The bias of communication*. Toronto: University of Toronto Press.
Innis, Harold Adams, & Drache, Daniel. (1995). *Staples, markets, and cultural change: Selected essays [of] Harold A. Innis* (Centenary ed.). Montreal: McGill-Queen's University Press.
Innis, Harold Adams, & Watson, A. John. (2007). *Empire and communications.* Toronto: University of Toronto.
Intel. (1998). Annual report: Intel.
Intel. (2000). Annual report: Intel.
Ip, Greg, & Schlesinger, Jacob. (2001, December 30). Did Greenspan push high-tech optimism on U.S. Growth a bit too far? *The WallStreet Journal,* p. 8. Retrieved from http://news.google.com/newspapers?nid=1915&dat=20011230&id=f_1GAAAAIBAJ&sjid=6fgMAAAAIBAJ&pg=1273,6173195
Ishii, Kenichi. (2006). Implications of mobility: The uses of personal communication media in everyday life. *Journal of Communication, 56*, 346-365.
ITU. (2011). The world in 2011: ICT facts and figures (ICT Data and Statistics Division, Trans.). Geneva: International Telecommunications Union.
Ives, Nat. (2006, November). Time alters its pitch. *Advertising Age*, *77*.
Jackson, Nicholas. (2011, August 9). Infographic: What would you give up to keep your smartphone? *The Atlantic*.
Jackson, Paul. (1999). *Virtual working: Social and organisational dynamics*: Taylor & Francis.

Jackson, Paul J., & Wielen, Jos van der. (1998). *Teleworking: International perspectives: From telecommuting to the virtual organisation*. London; New York: Routledge.

Jameson, Fredric. (1998). *The cultural turn: Selected writings on the postmodern, 1983-1998*. New York: Verso.

Johnston, Stuart J. (1998, November 16). Microsoft targets wireless. *InformationWeek*.

Jung, C. G., & Franz, Marie-Luise von. (1964). *Man and his symbols*. Garden City, N.Y., Doubleday.

Katz, James Everett. (2008). *Handbook of mobile communication studies*. Cambridge, Mass.: MIT Press.

Kenedy, Kristen. (2002, September 23). Wireless workflow extends the enterprise. *CRN,* 52.

Kennedy, Carol. (1989). The transformation of AT&T. *Long Range Planning, 22*(3), 10-17. doi: 10.1016/0024-6301(89)90002-2

Kenney, Martin, & Pon, Bryan. (2011). Structuring the smartphone industry. *BRIE Working Paper Series*: ETLA The Research Institute of the Finnish Economy.

Khan, Mickey Alam. (2008, April 22). BlackBerry posts fastest rise in brand value: Millward brown. *Mobile Marketer*.

Khermouch, Gerry. (1997, August 4). No pilot error here. *Brandweek*.

Khoshafian, Setrag, & Buckiewicz, Marek. (1995). *Introduction to groupware, workflow, and workgroup computing*. New York: Wiley.

Kildadze, Tim. (2010, July 19). Speed, privacy and price give BlackBerry's messenger an edge, *The Globe and Mail*.

Kittler, Friedrich. (1999). *Gramaphone, film, typewriter*. Stanford, CA: Stanford University Press.

Kittler, Friedrich. (2010). *Optical media.* Malden, MA: Polity.

Kline, Ronald R. (2006). Cybernetics, management science, and technology policy: The emergence of "information technology" as a keyword, 1948-1985. *Technology and Culture, 47*(3), 513-535.

Kotorov, Radoslav P. (2002). Ubiquitous organization: Organizational design for e-CRM. *Business Process Management Journal, 8*(3), 218-232.

Kramer, Matt. (1992, November 9). Wireless communication opens new doors; but technical hurdles remain for communications industry. *PC Week, 9*.

Krashinsky, Susan. (2013, January 31). BlackBerry’s brave new world. *The Globe and Mail.* Retrieved from http://www.theglobeandmail.com/report-on-business/industry-news/marketing/blackberrys-brave-new-world/article8087553/

Kratke, Stefan. (2010). 'Creative cities' and the rise of the dealer class: A critique of Richard Florida's approach to urban theory. *International Journal of Urban and Regional Research, 34*(4), 835-853.

Laberis, Bill. (2002). Black, white, red. *Adweek, 22*.

Lace, Susanne, & National Consumer Council. (2005). *The glass consumer: Life in a surveillance society*. Bristol: Policy.

Laziridis, Mike (2008, April 30). [Mike Lazaridis oral history].

Lederman, Marsha. (2013, March 8). How Alicia Keys is gearing up for a world tour (with toddler in tow), *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/arts/music/alicia-keys-singer-songwriter-smartphone-exec/article9474046/

Lee, Micky. (2011). Google ads and the blindspot debate. *Media, Culture & Society, 33*(3), 433-

447.
Leibovitz, Joseph. (2003). Institutional barriers to associative city-region governance: The politics of institution-building and economic governance in 'Canada's Technology Triangle'. *Urban Studies, 40*(13), 2613-2642.
Leitch, Carolyn. (2000, June 30). RIM profit plummets as marketing costs jump, *The Globe and Mail,* p. B12.
Lerner, Joshua. (2009). *Boulevard of broken dreams: Why public efforts to boost entrepreneurship and venture capital have failed, and what to do about it*. Princeton: Princeton University Press.
Lévi-Strauss, Claude. (1970). *The raw and the cooked*. London: J. Cape.
Lewis, Michael. (2011, July 01). Nortel gets $4.5 billion for its patents, *The Toronto Star*. Retrieved from http://www.thestar.com/business/article/1018124--nortel-gets-4-5-billion-for-its-patents
Lichtenberg, Frank R. (1989). The impact of the strategic defense initiative on US civilian R&D investment and industrial competitiveness. *Social Studies of Science, 19*, 265-282.
Liebowitz, S. J., & Margolis, Stephen E. (1995). Path dependence, lock-in, and history. *Journal of Law, Economics, & Organization, 11*(1), 205-226. doi: 10.2307/765077
Limburg, Diana, & Jackson, Paul J. (2007). Teleworkflow: Supporting remote control with workflow management systems. *New Technology, Work and Employment, 22*(2), 146-167.
Lincoln, Bruce. (1999). *Theorizing myth: Narrative, ideology, and scholarship*. Chicago: University of Chicago Press.
Lindmark, Sven, Andersson, Erik, Johansson, Mattias, & Bohlin, Erik. (2004). Telecom dynamics: History and state of the Swedish telecom sector and its innovation system 1970-2003. Goteborg, Seden: Department of Innovation Engineering and Management, Chalmers University of Technology.
Linzmayer, Owen W. (2004). *Apple confidential 2.0: The definitive history of the world's most colorful company* (2nd ed.). San Francisco: No Starch Press.
Live Nation. (2009). U2 360 tour presented by blackberry: Fastest sell out & largest concert attendance.
Livingston, Jessica. (2008). *Founders at work: Stories of startups' early days*. New York: Apress.
Lizardo, Omar. (2010). Beyond the antinomies of structure: Levi-strauss, Giddens, Bourdieu, and Sewell. *Theory and Society, 39*(6), 651-688.
Long, Mark. (2010, December 17). RIM reports record growth in international markets. *CIO*.
Longford. (2008).
Louderback, Jim. (1992, September 21). Wireless e-mail could cause a quiet revolution. *PC Week, 9*.
Loudermilk, Stephen. (1992, November 2). RAM Mobile Data partners to link programs over wireless network. *PC Week, 9*.
Loudermilk, Stephen. (1993, February 15). Wireless network providers gear up for mobile '93 show. *PC Week, 10*.
Lundvall, Bengt-Ake. (2004). *Why the new economy is a learning economy*. Copenhagen: Department of Business Studies, Aalborg University.
Lyon, David. (1994). *The electronic eye: The rise of surveillance society*. Minneapolis: University of Minnesota Press.

MacDonald, Larry. (2000). *Nortel Networks: How innovation and vision created a network giant*. Toronto: J. Wiley & Sons Canada.

Machlup, Fritz. (1962). *The production and distribution of knowledge in the United States*. Princeton, N. J.: Princeton University Press.

MacNamara, William. (2012, June 6). Why the BlackBerry wasn't a strawberry, *The Times*. Retrieved from http://www.thetimes.co.uk/tto/business/industries/supportservices/article3436690.ece

Macpherson, C. B. (1964). *The political theory of possessive individualism: Hobbes to Locke*. London: Oxford University Press.

Madden, Mary, & Jones, Sydney. (2008). Networked workers. Washington D.C.: Pew Research Center's Internet & American Life Project.

Mager, Astrid. (2012). Algorithmic ideology: How capitalist society shapes search engines. *Information, Communication and Society, 15*(5), 769-787.

Magliocca, Gerard, N. (2007). Blackberries and barnyards: Patent trolls and the perils of innovation. *Law and Technology Scholarship*.

Malone, Michael S. (1999). *Infinite loop: How the world's most insanely great computer company went insane* (1st ed.). New York: Currency/Doubleday.

Malykhina, Elena. (2007, October 10). Sprint adding BlackBerry Pearl 8130 to prosumer lineup, *Information Week*.

Maney, Kevin. (2001, May 7). BlackBerry: The heroin of mobile computing, *USA Today*.

Manovich, Lev. (2001). *The language of new media*. Cambridge, Mass. ; London: MIT Press.

Manpower. (2010). World of work insight: Putting flexible work arrangements into practice: Manpower.

Mantelman, Lee. (1992). Workflow: Improving the flow of corporate data. *InfoWorld, 14*.

Manzerolle, Vincent. (2010). Mobilizing the audience commodity: Digital labour in a wireless world, *Ephemera, 10*(3/4), 455-469.

Manzerolle, Vincent, & Smeltzer, Sandra. (2011). Consumer databases and the commercial mediation of identity: A medium theory analysis. *Surveillance and Society, 8*(3), 323-337.

Manzerolle, Vincent, & Kjosen, Atle. (2012). The communication of capital: Digital media and the logic of acceleration, *Triple C: Cognition, Communication, Co-operation,* 10(2), 214-229.

Manzerolle, Vincent, & Kjosen, Atle. (2013). Dare et capere: Virtuous mesh / targeting diagram. In Svitlana Matviyenko and Paul D. Miller (Eds.), *The Imaginary App*. Cambridge, Mass.: MIT Press. Forthcoming.

Manzerolle, Vincent, & McGuigan, Lee (Eds.). (2013). *The audience commodity in a digital age: Revisiting a theory of commercial media*. New York: Peter Lang. Forthcoming.

Martin, Michele. (1991). Communication and social forms: The development of the telephone, 1876-1920. *Antipode, 23*(3), 307-333.

Marwick, Alice E. (2010). *Status update: Celebrity, publicity and self-branding in web 2.0*. Doctor of Philosophy New York University, New York.

Marx, Karl. (1973). *Grundrisse: Foundations of the critique of political economy* ([1st American ed.). New York: Random House.

Marx, Karl. (1981). *Capital: Volume III* (David Fernbach, Trans.). London: Penguin Classics.

Marx, Karl. (1984). *The poverty of philosophy* (Harry Quelch, Trans.). Moscow: Progress.

Marx, Karl, & Fowkes, Ben. (1976). *Capital: A critique of political economy*. Harmondsworth,

Eng.: Penguin.
Marx, Karl, & Krader, Lawrence. (1972). *The ethnological notebooks of Karl Marx. (studies of Morgan, Phear, Maine, Lubbock)*. Assen: Van Gorcum.
Marx, Leo. (1964). *The machine in the garden: Technology and the pastoral ideal in America*. New York: Oxford University Press.
Masuda, Yoneji. (1981). *The information society: As post-industrial society*. Washington, D.C.: World Future Society.
Masuda, Yoneji. (1990). *Managing in the information society: Releasing synergy Japanese style* (2nd ed.). Oxford, OX, UK ; Cambridge, Mass., USA: Basil Blackwell.
Mathison, S. L., Roberts, L. G., & Walker, P. M. (2012). The history of Telenet and the commercialization of packet switching in the T.S. *Communications Magazine, IEEE, 50*(5), 28-45.
Mattelart, Armand. (1996). *The invention of communication*. Minneapolis, Minn.: University of Minnesota Press.
Mattelart, Armand. (2000). *Networking the world, 1794-2000*. Minneapolis, Mn.: University of Minnesota Press.
Mattelart, Armand. (2003). *The information society: An introduction*. London: Sage Publication.
Mayr, Otto. (1971a). Adam Smith and the concept of the feedback system: Economic thought and technology in 18th-century Britain. *Technology and Culture, 12*(1), 1-22.
Mayr, Otto. (1971b). Maxwell and the origins of cybernetics. *Isis, 62*, 425-444.
McAteer, Seamus. (2001). Wireless in the enterprise. New York, NY: Jupiter Media Metris.
McCall, Margo. (2001). Paging companies face delisting threat. [Article]. *Wireless Week, 7*(3), 23.
McGuigan, Jim. (2000). Sovereign consumption. In Martyn J. Lee (Ed.), *The consumer society reader* (pp. 294-299). Malden, MA: Blackwell Publishing.
McGuigan, Lee. (2010). *Ubiquitous and loving it*. Unpublished. University of Western Ontario. London, Ontario.
McLean, Robert I. G., Ontario. Premier's Council., & Canadian Institute of Chartered Accountants. (1995). *Performance measures in the new economy: A report commissioned by the premier's council with support from the Canadian institute of chartered accountants*. Toronto: The Council.
McLoughlin, I., & Jackson, P. (1996). *Organisational learning and virtual technologies: Towards a research agenda.* Paper presented at the Proceedings of the Second International Workshop on Telework: 'Building Actions on Ideas', Tilburg University.
McLuhan, Marshall. (1964). *Understanding media: The extensions of man*. New York: McGraw-Hill.
McLuhan, Marshall, & Nevitt, Barrington. (1972). *Take today: The executive as dropout* (1st ed.). Don Mills, Ont.: Longman Canada.
McNally, David. (2011). *Global slump: The economics and politics of crisis and resistance*. Winnipeg: PM Press.
McNally, Michael B. (2010). Enterprise content management systems and the application of Taylorism and Fordism to intellectual labour. *Ephemera, 10*(3/4), 357-373.
McQueen, Rod. (2010). *BlackBerry: The inside story of Research in Motion*. Toronto: Key Porter.
Melody, William. (2007). Cultivating knowledge for knowledge societies at the intersections of economic and cultural analysis. *International Journal of Communication 1*, 70-78.

Menzies, Heather. (1996). *Whose brave new world? The information highway and the new economy*. Toronto: Between the lines.
Menzies, Heather. (1997). Telework, shadow work: The privatization of work in the new digital economy. *Studies in Political Economy, 53*(Summer), 103-124.
Merrill, Michael. (1994, February). Wireless data comes of age. *Cellular Business, 11*.
Messmer, Ellen. (1993, December 6). Motorola asserts patent claims on CDPD service. *Network World, 10*.
Metselaar, Carolien, & van Dael, Ruud. (1999). Organisations going virtual. *AI & Society, 13*, 200-209.
Meyers, Jason. (1998, March 23). Future shock. *Telephony, 234*.
Michaluk, Kevin, Trautschold, Martin, Mazo, Gary, Markham, James, Andres, Clay, Anglin, Steve. (2011). *Crackberry true tales of BlackBerry use and abuse.* SpringerLink
Mickelson, Aleah. (2002, March 11). BlackBerry steals the show. *Wireless Week,* 54.
Micklethwait, John, & Wooldridge, Adrian. (1996). *The witch doctors: Making sense of the management gurus*. New York: Times Books.
Middleton, Catherine. (2007). Illusions of balance and control in an always-on environment: A case study of BlackBerry users. *Continuum Journal of Media & Cultural Studies, 21*(2), 165-178.
Middleton, James. (2009, August 2009). Apple, RIM poised to lead smartphone market. *Telecoms*.
Miller, Hugo. (2010, December 13). Mobile applications sales to reach $35 billion by 2014, *Bloomberg*.
Miller, Joseph Scott. (2007). Standard setting, patents, and access lock-in: Rand licensing and the theory of the firm. *Indiana Law Review, 40*(351), 351-395.
Mitchell, Lori, & Railsback, Kevin. (2000, December 25). Wireless LANs and Internet access free workers from their desks. *InfoWorld, 22*.
Mittal, Kunal, Gupta, Shikha. (2010). *BlackBerry for work productivity for professionals.* SpringerLink.
Miyamoto, Michiko, Kudo, Shuhei, & Iizuka, Kayo. (2011). Measuring business and information technology value in BPR: An empirical study in the Japanese enterprises. *World Academy of Science, Engineering and Technology, 59*, 1756-1760.
Mock, Dave. (2005). *The Qualcomm equation: How a fledgling telecom company forged a new path to big profits and market dominance*. New York: AMACOM, American Management Association.
Molisch, Andreas F. (2011). *Wireless communications* (2nd ed.). Hoboken, NJ: Wiley
Moore, Geoffrey A. (1995). *Inside the tornado: Marketing strategies from silicon valley's cutting edge* (1st ed.). New York: HarperBusiness.
Morgan, Gareth. (1993). *Imaginization: The art of creative management*. Newbury Park, Calif.: Sage Publications.
Morgenson, Gretchen. (2000, April 16). At Waterloo, a technology stock's retreat, *New York Times*.
Mosco, Vincent. (1998). Myth-ing links: Power and community on the information highway. *The Information Society, 14*, 57-62.
Mosco, Vincent. (2004). *The digital sublime: Myth, power, and cyberspace*. Cambridge, Mass.; London: MIT Press.
Moses, Asher. (2006, May 18). RIM CEO reveals upcoming BlackBerry feature-set. *CNET*.

Mossberg, Walter S. (1996, March 28). Finally, a palm-size computer that's easy to use and cheap, *The Wall Street Journal*. Retrieved from http://online.wsj.com/article/SB830280991889606500-search.html

Mossberg, Walter S. (2006, September 7). Pearl BlackBerry offers video, camera, music, as well as great email, *Wall Street Journal*.

Mowery, David C., & Langlois, Richard N. (1996). Spinning off and spinning on(?): The federal government role in the development of the US computer software industry. *Research Policy, 25*, 947-966.

Mowshowitz, Abbe. (1994). Virtual organization: A vision of management in the information age. *The Information Society, 10*(4), 267-288.

Mumford, Lewis. (1970). *The myth of the machine: The pentagon of power*. New York,: Harcourt, Brace.

Mumford, Lewis, & Winner, Langdon. (2010). *Technics and civilization* (University of Chicago Press ed.). Chicago ; London: The University of Chicago Press.

Murphy, Victoria. (2005, March 28). BlackBerry jam. *Forbes, 175,* 52-53.

NCFH. (2012). Facts about farmworkers: National Center for Farmworker Health.

Neill, Robin. (1972). *A new theory of value; the Canadian economics of H. A. Innis*. [Toronto, Buffalo]: University of Toronto Press.

Nelles, Jen, Bramwell, Allison, & Woldfe, David A. (2005). History, culture and path dependency: Origins of the Waterloo ICT cluster. In David A. Wolfe & Matthew Lucas (Eds.), *Global networks and local linkages: The paradox of cluster development in an open economy* (pp. 227-252). Montreal and Kingston: McGill-Queens University PRess.

Newitz, Annalee. (2006). The boss is watching your every click. *New Scientist, 191,* 30-31.

Nietzsche, Friedrich Wilhelm. (1956). *The birth of tragedy and the genealogy of morals* ([1st ed.). Garden City, N.Y.: Doubleday.

Niosi, Jorge, Manseau, André, & Godin, Benoit. (2000). *Canada's national system of innovation*. Montreal: McGill-Queen's University Press.

NDP Intellect. (2000). Data show holiday sales growth at retail across many information technology categories: NPD Intellect.

Noble, David F. (1977). *America by design: Science, technology, and the rise of corporate capitalism* (1st ed.). New York: Knopf.

Nora, Simon, & Minc, Alain. (1980). *The computerization of society: A report to the president of France*. Cambridge, Mass.: MIT Press.

Norris, Pippa. (2000). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. New York: Cambridge University Press.

Nye, David E. (2007). *Technology matters questions to live with.* Cambridge, Mass.: MIT Press.

OECD. (1995). Communications outlook. Paris: Organisation for Economic Co-Operation and Development.

OECD. (2001). The new economy: Beyond the hype - final report on the OECD growth project. Paris: Organisation for Economic Co-Operation and Development.

OECD. (2004a). Patents and innovation: Trends and policy challenges. Paris: Organisation for Economic Co-Operation and Development.

OECD. (2004b). Trade and migration building bridges for global labour mobility: Building bridges for global labour mobility. Paris: Organisation for Economic Co-Operation and Development; World Bank; International Organisation for Migration.

Okin, J. R. (2005). *The Internet revolution: The not-for-dummies guide to the history,* *technology, and use of the Internet* (1st Ironbound Press ed.). Winter Harbor, Maine: Ironbound Press.

Ontario Liberal Party. (2011). Forward. Together. The Ontario liberal plan 2011-2015. Toronto: Ontario Liberal Party.

Ontario Ministry of Finance. (2012). Ontario fact sheet. Toronto: Ontario Ministry of Finance.

Ontario Ministry of Tourism and Culture. (2010). Ontario's entertainment & creative cluster: A framework for growth. Toronto: Ontario Ministry of Tourism and Culture.

Ontario Technology Corridor. (2009). Research in Motion's BlackBerry smartphone provides on-the-go email, text messaging and Internet access. Waterloo, Ontario: Ontario Technology Corridor.

Osterland, Andrew W. (1994, October 25). Cable's other Ted. *Financial World*.

Overbeek, Henk. (2002). Neoliberalism and the regulation of global labor mobility. *Annals of the American Academy of Political and Social Science, 581*(1), 74-90.

Ovide, SHira. (2011, July 12). R.I.P., Palm, *Wall Street Journal*. Retrieved from http://blogs.wsj.com/deals/2011/07/12/r-i-p-palm/

Ovum. (2012). Ovum predicts that smartphones to hit 1.7 billion in 2017: Ovum.

Owram, Kristine. (2009, August 17). Fortune names RIM world's fastest-growing firm, *The Toronto Star*.

Palley, Thomas. (2005). The questionable legacy of Alan Greenspan. *Challenge, 48*(6), 5-19.

Pariser, Eli. (2011). *The filter bubble: What the Internet is hiding from you*. London ; New York: Viking.

Parker, Ian. (1985). Staples, communications, and the economics of capacity, overhead costs, rigidity, and bias. In Duncan Cameron (Ed.), *Explorations in Canadian economic history: Essays in honour of Irene M. Spry* (pp. 73-94). Ottawa: University of Ottawa Press.

Pasquinelli, Matteo. (2009). Google PageRank algorithm: A diagram of cognitive capitalism and the rentier of the common intellect. Paper presented at the Society of the Query Conference, Amsterdam, The Netherlands. http://matteopasquinelli.com/society-of-the-query/

Peck, Jamie. (2005). Struggling with the creative class. *International Journal of Urban and Regional Research, 29*(4), 740-770.

Peladeau, Pierre, Friedrich, Roman, Toumi, Mohssen, & Acker, Olaf. (2012). *Mobile app stores for telecom operators the next battlefield*. New York: Booz & Co.

Pender, Lee, & Ware, Lorraine Cosgrove. (2001, March 15). Decidedly not gee whiz. *CIO, 14,* 130-131.

PEPSO. (2013). It's more than poverty: Employment precarity and household well-being. Toronto, Hamilton: Poverty and Employment Precarity in Southern Ontario, McMaster University Social Sciences.

Peters, John Durham. (1999). *Speaking into the air: A history of the idea of communication*. Chicago: University of Chicago Press.

Pfanner, Eric. (2013, January 20). France proposes an Internet tax, *The New York Times*. Retrieved from http://www.nytimes.com/2013/01/21/business/global/21iht-datatax21.html?pagewanted=all&_r=0&_r=0

Plewa, Jeffrey, & Pliskin, Steven. (1995, July). Client/server everything. *CIO, 8*.

Pogue, David. (2002, May 9). Cultivating the BlackBerry as a hybrid, *New York Times*.

Pogue, David. (2005, November 3). Corporate tool, yes, but bright and handy, *New York times*.

Postman, Neil. (1985). *Amusing ourselves to death: Public discourse in the age of show*

business. New York, NY: Penguin.
Pratt, Joanne H. (1997). Counting the new mobile workforce. Washington, D.C.: U.S. Department of Transportation, Bureau of Transportation Statistics.
Pruijt, Hans. (1998). Multiple personalities: The case of business process reengineering. *Journal of Organizational Change Management, 11*(3), 260-268.
Quinn, James Brian. (1992). *Intelligent enterprise: A knowledge and service based paradigm for industry*. Toronto: Free Press.
Rash, Wayne. (1999, August 23). Get out of denial: Plan for enterprise wireless. *InternetWeek*.
Reeve, Rebecca. (2007). *Constant connectivity in a wireless age: The discursive promotional strategies of the blackberry.* Masters of Arts (Media Studies), Concordia University, Montreal, Quebec, Canada. Retrieved from http://rebecca-reeve.com/constant-connectivity/
Reuters. (2009, May 4). Blackberry curve seen better than iphone, *The New York Times*.
RIM. (1998). Annual report 1998. Waterloo: Research in Motion.
RIM. (1999). Annual report 1999. Waterloo: Research in Motion.
RIM. (2000). Annual report 2001. Waterloo: Research in Motion.
RIM. (2001). Annual report 2001. Waterloo: Research in Motion.
RIM. (2003). Annual report 2003. Waterloo: Research in Motion.
RIM. (2006). Annual report 2006. Waterloo: Research in Motion.
RIM. (2007a). Annual report 2007. Waterloo: Research in Motion.
RIM. (2007b). RIM introduces the BlackBerry Pearl. Waterloo: Research in Motion.
RIM. (2007c). RIM introduces the BlackBerry Curve smartphone. Waterloo: Research in Motion.
RIM. (2008a). Annual report 2008. Waterloo: Research in Motion.
RIM. (2008b). MySpace and RIM usher in new era of mobile social networking. Waterloo: Research in Motion.
RIM. (2010). RIM announces BBM social platform. Waterloo: Research in Motion.
RIM. (2011). Annual report 2010. Waterloo: Research in Motion.
RIM. (2012). More BBM-connected apps set to launch. Waterloo: Research in Motion.
Robertson, Grant. (2011, September 6). Rogers sets sites on banking business, *The Globe and Mail*.
Robin, Francesca. (2012, August 1). The emerging market that could kill the iPhone. *CNN Money*.
Robins, Kevin, & Webster, Frank. (1999). *Times of the technoculture: From the information society to the virtual life*. New York: Routledge.
Robinson, Nicholas, Ensign, Prescott C., & University of Ottawa. School of Management. (2006). *BlackBerry in red China: Research in Motion navigates institutional barriers in an emerging market*. Ottawa: School of Management, University of Ottawa.
Robson, Mike, & Ullah, Philip. (1996). *A practical guide to business process re-engineering*. Brookfield, Vt., USA: Gower.
Rockel, Nick. (2012, February 8). 'Bring your own device to work' more than a trend, *The Globe and Mail*. Retrieved from http://www.theglobeandmail.com/technology/bring-your-own-device-to-work-more-than-a-trend/article544805/
Rogers Cantel. (1991). Annual report 1991. Toronto: Rogers Cantel.
Rogers Cantel. (1993). Annual report 1993. Toronto: Rogers Cantel.
Rogers, Ted, & Brehl, Robert. (2008). *Relentless: The true story of the man behind Rogers*

Communications (1st ed.). Toronto, Ont.: HarperCollins.

Romero, Simon. (2000, July 10). Untangling the wireless web - cellular Internet is a format war for carriers, *New York Times*. Retrieved from http://www.nytimes.com/2000/07/10/business/untangling-the-wireless-web-cellular-internet-is-a-format-war-for-the-carriers.html?pagewanted=all&src=pm

Romero, Simon. (2001, September 20). The right connections; the simple BlackBerry allowed contact when phones failed, *The New York Times*. Retrieved from http://www.nytimes.com/2001/09/20/technology/the-right-connections-the-simple-blackberry-allowed-contact-when-phones-failed.html?src=pm

Rooney, Paula. (1993, May 10). Lotus adds Notes allies, wireless gateway. *PC Week*.

Ross, Jeanne W., & Feeny, David F. (1999). The evolving role of the CIO. Cambridge, Mass.: Center for Information Systems Research, Massachusetts Institute of Technology.

Ryan, Alan J. (1991). The whole world in your hand? *Computerworld, 25*(20).

Rybczynski, T. (2009). Commercialization of packet switching (1975-1985): A Canadian perspective [history of communications]. *Communications Magazine, IEEE, 47*(12), 26-31. doi: 10.1109/mcom.2009.5350364

Santos, Adelino. (1995). *Multimedia and groupware for editing*. New York: Springer.

Sargent, Rose-Mary. (2012). From Bacon to Banks: The vision and the realities of pursuing science for the common good. *Studies in History and Philosophy of Science,* 43, 82-90.

Saveri, Gabrielle. (1997, August 25). Geoffrey A. Moore—marketing consultant and author. *Businessweek*.

Sbihli, Scott. (2002). *Developing a successful wireless enterprise strategy a manager's guide.* New York, NY: Wiley.

Schienstock, Gerd. (2011). Path dependency and path creation: Continuity vs. fundamental change in national economies. *Journal of Futures Studies, 15*(4), 63-76.

Scholz, Trebor. (2008). Market ideology and the myths of web 2.0. *First Monday, 13*(3).

Scott, Suzanne. (2009). Repackaging fan culture: The regifting economy of ancillary content models. *Transformative Works and Cultures, 3*.

SDI. (1992). Technology applications report 1992. Washington, D.C.: Strategic Defense Initiative, Office of Technology Applications.

Seidenberg, Steven. (2012). A bigger, meaner patent war. *IPWatch.org* Retrieved from http://www.ip-watch.org/2012/06/25/a-bigger-meaner-patent-war/

Shaffer, Richard A. (1993, January 4). The new data on cellular. *Forbes, 151*.

Shannon, Claude Elwood, & Weaver, Warren. (1949). *The mathematical theory of communication*. Urbana: University of Illinois Press.

Sharma, Chetan. (2000). *Wireless Internet enterprise applications* (1st ed.). Hoboken, NJ: Wiley.

Sharpe, Richard. (2007). Brains, generations and one last push: Myths used to establish and sustain the computer industry. In Judith Burnett, Peter Senker & Kathy Walker (Eds.), *Myths of technology: Innovation and inequality* (pp. 69-82). New York: Peter Lang.

Shirky, Clay. (2008). *Here comes everybody: The power of organizing without organizations*. New York: Penguin Press.

Silver, Sara. (2009a, March 30). BlackBerry's consumer push is coming at a price for RIM, *The Wall Street Journal*.

Silver, Sara. (2009b, June 19). Consumers drive bulk of BlackBerry growth, *The Wall Street Journal*.

Simon, Bernard. (2002, April 29). Losses persist as BlackBerry gains rivals, *New York Times*.

Simondon, Gilbert, Hart, John Francis, & Mellamphy, Ninian. (1980). *On the mode of existence of technical objects*. [London, Ont.]: University of Western Ontario.
Simone, Rose. (2012, January 30). RIM's co-founder on the BlackBerry-maker's past, future and its new CEO Thorsten Heins, *Toronto Star*. Retrieved from http://www.thestar.com/business/2012/01/30/rims_cofounder_on_the_blackberrymakers_past_future_and_its_new_ceo_thorsten_heins.html
Slater, Derek. (1997, November 15). Wary of groupware? *CIO, 11*.
Smith, Aaron. (2012). The best (and worst) of mobile connectivity: Pew Research Center.
Smith, Adam D., & Faley, Robert A. (2001). E-mail workplace privacy issues in an information and knowledge-based environment. *Southern Business Review, 27*(1), 8-23.
Smith, Brad. (2004, August 15). RIM co-founder seeks simplicity. *Wireless Week*.
Smith, Larry. (1993). Regional municipality of Waterloo: Dynamic profile of the economy of waterloo region. Waterloo.
Smythe, Dallas Walker. (1981). *Dependency road: Communications, capitalism, consciousness and Canada*. Norwood, NJ: Ablex Pub.
Snickars, Pelle, & Vonderau, Patrick (Eds.). (2012). *Moving data: The iPhone and the future of media*: Columbia University Press.
Solano, Liza A. (1998, November 17). Ericsson launches strategy for new world of telecommunications technology. *Business World*.
Sorensen, Carsten, & Gibson, David. (2003). Ubiquitous visions and opaque realities: Professionals talking about mobile technologies. *info, 6*(3), 188-196.
Sorensen, Chris, Gulli, Cathy, & Warnica, Richard. (2012, January 27). The fall of the BlackBerry titans. *Macleans*. Retrieved from http://www2.macleans.ca/2012/01/27/the-fall-of-the-blackberry-titans/
Southworth, Natalie. (2001, July 27). B2E pays off for workers, employers, *The Globe and Mail,* p. E07.
Spence, Nick. (2009, March 11). U2 dumps Apple for RIM. Retrieved from http://www.networkworld.com/news/2009/031109-u2-dumps-apple-for-rim.html
Srivatsan, Nagaraja. (2001). Making wireless work. *CIO, 14,* 42.
Statistics Canada, & Finance, Ontario Ministry of. (2009). 2009 Ontario economic outlook and fiscal review. Toronto: Ontario Ministry of Finance.
Steinbock, Dan. (2003). Two drivers and irrational exuberance: Markets, the Internet and mobility. *The International Journal on Media Management, 5*(2), 109-126.
Stenzel, Joe. (2011). *CIO best practices: Enabling strategic value with information technology* (2nd ed.). Hoboken, N.J.: Wiley.
Stiegler, Bernard. (2012). Relational ecology and the digital pharmakon. *Culture Machine, 13*, 1-19.
Stodder, David. (2000, June 5). The pervasive invasion. *Intelligent Enterprise, 3*.
Strategy Analytics. (2013). Apple becomes largest mobile phone vendor in United States in q4 2012.
Stengel, Richard. (2006). Person of the year. *Time Magazine, 168* (26), 9.
Strenski, Ivan. (1987). *Four theories of myth in twentieth-century history: Cassirer, Eliade, Lévi-Strauss, and Malinowski* (1st ed.). London: Macmillan Press.
Strom, David. (1993, August 23). Wireless networking. *Infoworld, 15*.
Subhash. (2007). Geography of venture capital financing in Canada. *Journal of Private Equity*.
Sunstein, Cass. (2004). Democracy and filtering. *Communications of the ACM, 47*(12), 57-59.

Suppa, Carly. (2002, June 14). Canadian wireless makers leap onto Sun's chugging J2ME train. *Network World, 12*.

Sutton, Neil. (2001, October 19). RIM wants 2.5G, Java for BlackBerry. *Computer Dealer News, 17*.

Sweeny, Alastair. (2011). *BlackBerry planet: The story of Research in Motion and the little device that took the world by storm*: John Wiley & Sons.

Sweeny, Dan. (1997). Wireless data's magic bullet? *Cellular Business, 14*.

Tabuchi, Hiroko, & Wingfield, Nick. (2012, August 31). Tokyo court hands win to Samsung, *The New York Times*. Retrieved from http://www.nytimes.com/2012/09/01/technology/in-japan-a-setback-for-apples-patent-fight.html?_r=1&ref=technology

Tapscott, Don. (1996). *The digital economy: Promise and peril in the age of networked intelligence*. New York: McGraw-Hill.

Tapscott, Don. (1999). *Creating value in the network economy*. Boston, MA: Harvard Business School Press.

Tapscott, Don, Lowy, Alex, & Ticoll, David. (2000). *Digital capital: Harnessing the power of business webs*. Boston, Mass.: Harvard Business School Press.

Task Force to Review the Ontario Technology Fund in the Context of an Innovation-Based Society., & Ontario. Premier's Council on Economic Renewal. (1993). Ontario 2002 a report [microform :]. Toronto: The Task Force,.

Taussig, Michael T. (1980). *The devil and commodity fetishism in South America*. Chapel Hill: University of North Carolina Press.

Taylor, Paul. (2012, February 27). Mobility ushers in a brave new world. *Financial Times*.

Terranova, Tizianna. (2012). Attention, economy and the brain. *Culture Machine*, *13*, 1-19.

Thompson, Eric C. (2009). Mobile phones, communities and social networks among foreign workers in singapore. *Global Networks, 9*(3), 359-380.

Tinnila, Markku. (1995). Strategic perspective to business process redesign. *Business Process Re-Engineering & Management, 1*(1), 44-59.

Toffler, Alvin. (1970). *Future shock*. New York: Random House.

Toffler, Alvin. (1980). *The third wave* (1st ed.). New York: Morrow.

Toffler, Alvin. (2006). *Revolutionary Wealth.* New York: Knopf.

Tomlinson, John. (2007). *The culture of speed: The coming of immediacy*. Los Angeles; London: SAGE.

Tournemille, Dale. (2004, January 16). SMB markets on the rise. *Computer Dealer News, 20*(6).

Trowbridge, Dave. (1992). Wireless WANs, SCSI, Windows star at Comdex. *Computer Technology Review, 12*.

Trowbridge, Dave. (1993, September). It's time to jump on the wireless WAN. *Computer Technology Review, 13*.

Tubbs, Graham, & Gillett, Terry. (2011). *Harvesting the BlackBerry: An insider's perspective*. Tuscon, Arizona: Wheatmark.

Turkle, Sherry. (2012). *Alone together: Why we expect more from technology and less from each other* (Paperback ed.): Basic Books.

Turow, Joseph. (2006). *Niche envy: Marketing discrimination in the digital age*. Cambridge, Mass.: MIT Press.

Turow, Joseph. (2011). *The daily you: How the new advertising industry is defining your identity and your worth*. New Haven: Yale University Press.

Turow, Joseph, & Tsui, Lokman. (2008). *The hyperlinked society: Questioning connections in the digital age*. Ann Arbor: University of Michigan Press: University of Michigan Library.
UFCW. (2011). The status of migrant farm workers in Canada 2010-2011: United Food and Commercial Workers.
United States Office of Personal Management. (2012). 2012 status of telework in the federal government report: Report to Congress: United States Office of Personnel Management.
Unknown. (2000, April 20). Microsoft in handheld battle, *The Globe and Mail,* p. B01/B08.
Ure, John. (2002). 3G auctions. In Robin Mansell, Rohan Smarajiva & Amy Mahan (Eds.), *Networking knowledge for information societies: Institutions and intervention*. Delft, The Netherlands: DUP Science.
U.S. Congress. (2010). Telework enhancement act. H.R. 1722. 111th Congress of the United States of America. Washington, D.C.
Uy-Tioco, Cecilia. (2007). Overseas Filipino workers and text messaging: Reinventing transnational mothering. *Continuum, 21*(2), 253-265.
Vanderburg, Willem H. (2004). The intellectual assembly line is already here. *Bulletin of Science, Technology & Society, 24*(4), 331-341.
Veblen, Thorstein. (1904). *The theory of business enterprise*. New York: C. Scribner's sons.
Veblen, Thorstein. (1921). *The engineers and the price system*. New York,: B. W. Huebush, inc.
Verespej, Michael A. (1994). The anytime, anyplace workplace. *Industry Week, 243*.
Vermono, Kira. (2001, May 16). BlackBerry sends laptops packing, *The Globe and Mail,* p. M01.
Vollmer, Christopher, & Precourt, Geoffrey. (2008). *Always on: Advertising, marketing, and media in an era of consumer control*. New York: McGraw-Hill.
Von Mises, Ludwig. (1977). *A critique of interventionism*. New Rochelle, N.Y.: Arlington House.
Waddell, Ray. (2011, July 29). U2 set to wrap biggest concert tour ever. *Billboard*.
Wajcman, Judy, & Bittman, Michael. (2009). Intimate connections: The impact of the mobile phone on work/life boundaries. In Gerard Goggin & Larissa Hjorth (Eds.), *Mobile technologies: From telecommunications to media* (pp. 9-22). New York: Routledge.
Wang, Jing. (2005). Youth culture, music, and cell phone branding in China. *Global Media and Communication, 1*(2), 185-201.
Wasserman, Todd. (2001). The fruits of his labor. *Brandweek, 42,* 44-48.
Wasserman, Todd. (2004, June 15). BBDO reaches out to BlackBerry 'prosumers,' *Adweek*.
Watson Fritz, Mary Beth, Sridhar, Narasimhan, & Rhee, Hyeun-Suk. (1998). Communication and coordination in the virtual office. *Journal of Management Information Systems, 14*(4), 7-28.
Watson-Manheim, Mary Beth, Chudoba, Katherine M., & Crowston, Kevin. (2002). Discontinuities and continuities: A new way to understand virtual work. *Information Technology & People, 15*(3), 191-209.
Weinberg, Stuart. (2011, June 16). RIM to face a reckoning on BlackBerry's appeal, *Wall Street Journal*.
Welz, Christian, & Wolf, Felix. (2010). Telework in the European Union. Brussels: Eurofound.
Weston, David, & Lim, Kwanghui. (2007). BlackBerry: A teaching case for WIPO. Melbourne, Australia: Intellectual Property Research Institute of Australia.
Wheaton, Ken. (2006, November 1). Dubious distinction: Crackberry is word of the year.

Advertising Age.
Wheeler, William. (2004). *Integrating wireless technology in the enterprise*. Boston; Oxford: Elsevier/Digital Press.
Whyte, William Hollingsworth. (1956). *The organization man*. Garden City, N.Y.,: Doubleday.
Wiener, Norbert. (1948). *Cybernetics: Or control and communication in the animal and the machine.* Cambridge, Mass.: MIT Press.
Williams, Raymond. (1961). *The long revolution*. London: Chatto & Windus.
Williams, Raymond. (1976). *Keywords: A vocabulary of culture and society*. New York: Oxford University Press.
Williams, Raymond. (1977). *Marxism and literature*. Oxford [Eng.]: Oxford University Press.
Williams, Raymond. (2000). Advertising: The magic system. In Raymond Williams (Ed.), *Problems in materialism and culture* (pp. 170-195). London: Verso.
Wilson, Carol, & Mason, Charles. (1993, May 8). Data services, cancer scare play heavily at wireless '93. *Telephony, 224*.
Wilson, Walt, & Hoffman, Sue. (1992, March 16). Soft-switch and ARDIS to integrate wireless and enterprise messaging technologies. *Business Wire*.
Winner, Langdon. (1978). *Autonomous technology: Technics-out-of-control as a theme in political thought* (1st pbk. ed.). Cambridge, Mass.: MIT Press.
Winner, Langdon. (1996). Who will be in cyberspace? *The Information Society*, 12, 63-72.
Winner, Langdon. (1999). Do artifacts have politics? In Donald MacKenzie & Judy Wajcman (Eds.), *The social shaping of technology* (second ed., pp. 28-40). Philadelphia: Open University Press.
Winseck, Dwayne Roy, & Jin, Dal Yong. (2011). *The political economies of media: The transformation of the global media industries.* London: Bloomsbury Academic.
Wintrob, Suzanne. (2001). Wireless firms eye growing small-business market, *The Globe and Mail,* p. W04.
Wolfe, David, & Gertler, Meric. (2001). Globalization and economic restructuring in Ontario: From industrial heartland to learning region? *European Planning Studies, 9*(5), 575-592.
World Economic Forum. (2011). Personal data: The emergence of a new asset class - opportunities for the telecommunications industry. World Economic Forum
World Economic Forum. (2012). Rethinking personal data: Strengthening trust. World Economic Forum.
Wortham, Jenna. (2012, November 3). How New Yorkers adjusted to sudden smartphone withdrawal, *The New York Times*.
Wortham, Jenna, & Rusli, Evelyn M. (2010, December 3). A silicon bubble shows signs of reinflating, *New York Times*. Retrieved from http://dealbook.nytimes.com/2010/12/03/a-silicon-bubble-shows-signs-of-reinflating/
Worthen, Ben. (2004, February 1). Wireless finally connects. *CIO*.
Woyke, Elizabeth. (2009, August 17). A brief history of the BlackBerry. *Forbes*.
Wright, Tom. (2008, December 5). Poorer nations go online on cellphones, *Wall Street Journal*.
Wu, Tim. (2006, Feb. 6, 2006). Weapons of destruction: How a tiny little “patent troll” got BlackBerry in a headlock. *Slate.* Retrieved from http://www.slate.com/id/2135559/
Wu, Tim. (2010). *The master switch: The rise and fall of information empires* (1st ed.). New York: Alfred A. Knopf.
Yakabuski, Konrad. (2009, September 9). Manufacturing: Make or break, *Globe and Mail*.
Yang, Ke. (2008). A preliminary study on the use of mobile phones amongst migrant workers in

Beijing. *Knowledge, Technology & Policy, 21*(2).
Yee, Lee Chyen, & Jim, Clare. (2011, August 1). Foxconn to rely more on robots; could use 1 million in 3 years, *Reuters*. Retrieved from http://www.reuters.com/article/2011/08/01/us-foxconn-robots-idUSTRE77016B20110801
Young, Lesley. (2000, August 28). BlackBerry connects via its partners. *Marketing Magazine, 105*.
Zagorin, Perez. (2001). Francis Bacon's concept of objectivity and the idols of the mind. *The British Journal for the History of Science*, 34, 379-393.
Zeidenberg, Jerry. (1992). The office of 2001 makes all the right connections. *Computing Canada,* 3-3.
Zeis, Adam. (2009, July 1). BlackBerry loves U2 - mobile album on the way. *Crackberry.com.* Retrieved from http://crackberry.com/blackberry-loves-u2
Ziedenberg, Jason. (1995). Lost in the technology triangle: If southwestern Ontario's "new economy" is a bowl of high-tech cherries, what is a fifth of the workforce doing in the pits? *This Magazine,* 33-37.
Ziegler, Chris. (2009, December 28). Ten years of BlackBerry. *Engadget*. Retrieved from http://www.engadget.com/2009/12/28/ten-years-of-blackberry/
Zwick, Detlev, & Knott, Janice Denegri. (2009). Manufacturing customers: The database as new means of production. *Journal of Consumer Culture, 9*(2), 221-247.
Zygmont, Jeffrey. (2003). *Microchip: An idea, its genesis, and the revolution it created*. Cambridge, MA: Perseus.
Zysman, George. (1995, Summer). Personal communications and instant networks. *AT&T Technology, 10*.

Interviews (I/…)

I/Smith, David. (2010, June 24). Interview by author. Waterloo, On.

I/Benedek, Joey. (2010, February 9). Interview by author. Waterloo, On.

I/Koen, Trudy. (2010, June 23). Interview by author. Waterloo, On..

I/Computer engineer at RIM. (2010, May 15). Interview by author. Phone conversation.

I/Marketing and advertising specialist at RIM. (2010, June 1). Interview by author. Phone conversation.

Appendix A: Letter of Information and Consent

[Name of participant]

[Position, Division, Company]

[City, Country]

Re: Academic research project, "A political economy of ubiquitous connectivity: myths, markets, and the Blackberry"

Dear [name of interview participant]:

Please accept this letter of information about our upcoming interview, as per our previous conversation(s). As previously noted, your participation will contribute to PhD dissertation research on recent changes in the mobile communication industry, and on changing conceptualizations of the end-user as they are reflected in the technical design and marketing of the Blackberry. Specifically, this research will explore how the convergence of work and leisure are reshaping the market for mobile communication devices and will focus on smartphones as they are being adapted for seamless and ubiquitous Internet connectivity. It will involve interviews with you and other individuals who work for Research In Motion (RIM) and are involved in the technical design and marketing of the Blackberry.

Our interview will be a private, one-on-one conversation at your office or another location at [date and time]. An audio-recorder will be used to record the discussion for my later consultation. Tapes and written transcripts of our conversation—transcribed by me—will be securely stored within a locked filing cabinet during the writing and analysis of this study, and will be destroyed within five years of this research project's completion, if you so request.

Throughout the interview process, your participation remains entirely voluntary. Be assured that you have the right to refuse to participate, to refuse to answer any questions, and to withdraw from the study at any time with no consequences. The results of my interview with you will be kept confidential and your identity will be kept anonymous, unless you offer written permission to disclose your identity via a separate waiver/letter, which I will make available to you. The nature of your comments, however, may reveal your identity or the identity of your organization—a matter I will work with you to address if you express concern or hesitation. If you would like to change or amend your responses prior to project finalization, this can be arranged. If you choose to grant permission to disclose your identity, you will retain the authority to indicate which (if any) information you would feel more comfortable keeping off the record.

There are no known risks involved with participating in this research. In fact, research participants may find gratification in being involved in a project that is anticipated to be of interest to both an academic and professional/industry readership.. If you have any questions about your rights as a research participant or the conduct of the study you may contact the Office of Research Ethics by telephone at 519.661.3036 or by email at ethics@uwo.ca.

By signing this document, you consent to the conditions and outcomes of the interview as described above. I appreciate your participation in this research and would be happy to provide you with further information. I look forward to our meeting.

____________________________ ________

Researcher's Signature Date

Vincent Manzerolle

PhD Candidate, Media Studies

University of Western Ontario

____________________________________ __________

Participant's Signature Date

Appendix B: Ethics Approval

Ethical Review of Research Involving Human Subjects

All non-medical research involving human subjects at the University of Western Ontario is carried out in compliance with the Social Sciences and Humanities Research Council Guidelines (2002). The Faculty of Information Media Studies (FIMS) Research Committee has the mandate to review FIMS student research proposals for adherence to these guidelines.

2009 – 2010 FIMS Research Committee Membership

1. K. Asquith
2. G. Campbell
3. H. Hill
4. P. McKenzie (Chair)*
5. D. Neal*
6. A. Quan-Haase
7. J. Ripley (alt)
8. D. Robinson (alt)
9. S. Smeltzer
10. L. Vaughan (alt)

Research Committee members marked with * have examined the research project FIMS 2010-006 entitled:

The Political Economy of Ubiquitous Connectivity: Myths, Markets, and the Blackberry

as submitted by: Sandy Smeltzer (PI) and Vince Manzerolle (student)

and consider it to be acceptable on ethical grounds for research involving human subjects under the conditions of the University's Policy on Research Involving Human Subjects. Approval is given for the period April 13, 2010 to August 30, 2010.

Approval Date: April 13, 2010

Curriculum Vitae

Name:	Vincent R. Manzerolle
Post-secondary Education and Degrees:	University of Windsor Windsor, Ontario, Canada 1999-2004 B.A.
	The University of Western Ontario London, Ontario, Canada 2004-2006 M.A.
	The University of Western Ontario London, Ontario, Canada 2006-2013 Ph.D.
Honours and Awards:	Province of Ontario Graduate Scholarship 2004-2005, 2005-2006
Related Work Experience	Sessional Instructor The University of Western Ontario 2009-2013
	Research Assistant OCAD University 2011-2012
	Research Assistant Mobile Experience Innovation Centre 2011-2012
	Teaching Assistant The University of Western Ontario 2004-2010
	Teaching Assistant University of Windsor 2002-2004

Publications:

McGuigan, Lee, & Manzerolle, Vincent. (Eds.) (2013). *The Audience Commodity in a Digital Age*. Peter Lang. Forthcoming.

Manzerolle, Vincent, & Kjosen, Atle. (2013). “Dare et Capere: Virtuous mesh / Targeting Diagram” in Svitlana Matviyenko and Paul D. Miller eds, *The Imaginary App*. MIT Press. Forthcoming,

Manzerolle, Vincent. (2013). “Technologies of Immediacy / Economies of Attention: On the Evolution of Mobile Media and Wireless Connectivity” in V. Manzerolle and L. McGuigan eds. *The Audience Commodity in a Digital Era*. Peter Lang. Forthcoming.

Manzerolle, Vincent, & Kjosen, Atle. (2012). “The Communication of Capital: Digital Media and the Logic of Acceleration” *Triple C: Cognition, Communication, Co-Operation.* Volume 10, Issue 2.

Manzerolle, Vincent. (2011). **“**Mobilizing the Audience Commodity: Digital Labour in a Wireless World” *Ephemera*, Volume 10, Issue 3/4.

Manzerolle, Vincent, & Smeltzer, Sandra. (2011). “Consumer Databases and the Commercial Mediation of Identity: A Medium Theory Analysis”, *Surveillance and Society*, special issue on Consumption and Surveillance, Volume 8, Issue 3.

Manzerolle, Vincent. (2010). **“**The Virtual Debt Factory: Towards an Analysis of Debt and Abstraction in the American Credit Crisis” *Triple C: Cognition, Communication, Co-Operation*, special issue on Crisis and Communication, Volume 8, Issue 2.