

Enterprise mobility: Researching a new paradigm

Rahul C. Basole

Tennenbaum Institute, Georgia Institute of Technology, 760 Spring Street NW, Atlanta, GA 30332, USA

E-mail: rahul.basole@ti.gatech.edu

Abstract: The proliferation of mobile information and communication technologies has led to a profound change in the way people work, communicate, and collaborate and conduct business. However, businesses today are just beginning to recognize the importance and potentially transformative impact of enterprise mobility. While the concept of enterprise mobility continues to emerge in the management and technology literatures, it is still not well understood. This special issue brings together global, multi-disciplinary perspectives from leading scholars and practitioners on the value and transformative impact of enterprise mobility on work, technology, and organizations, discusses critical enablers and strategies, and provides case study insights.

1. Introduction

The logic for enterprise adoption and use of mobile information and communication technologies (ICT), such as laptops, smart phones and other handheld devices, is well recognized. Any technology that can deliver tangible business benefits, by making information more accessible, is generally considered a good thing. Initial case studies have supported these propositions; commonly observed benefits of enterprise mobility include higher levels of end-user convenience, efficiency, productivity, decision-speed, and process improvement [8].

However, this was not always the case. When enterprises first began to evaluate and adopt mobile ICT, the underlying technology enablers were still fairly immature and often failed to deliver on the expected benefits. Similarly, enterprises were not adequately “ready” to embrace mobile ICT; they often lacked a technological infrastructure, business processes, human resources, leadership, and organizational culture that could facilitate and accelerate enterprise mobility implementations [9]. The predictable outcome was widespread disappointment. Many considered mobile ICT to be another hyped up technology with only little enterprise value.

Today, much has changed. The underlying technology has improved significantly. The central pieces of the mobile data equation, which we refer to as the mobile *DNA* (devices, networks and infrastructure, and applications), are all falling into place: devices are becoming more suited for mobile data use, wireless networks are maturing and becoming increasingly ubiquitous and capable of handling higher data throughput, and value-added mobile applications are rapidly emerging. Likewise, enterprises are realizing the long-term, strategic benefits that enterprise mobility can deliver: efficiencies, cost savings, new competitive advantages and core competencies – all capable of fundamentally transforming existing organizational, business model and strategy paradigms [5,13]. With these opportunities in mind, many enterprises are preparing for a mobile future.

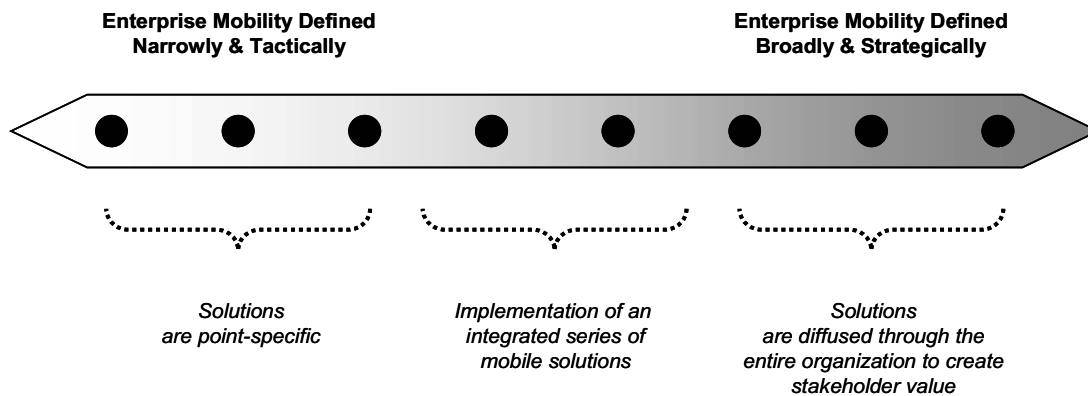


Fig. 1. The Enterprise Mobility Continuum.

The perfect storm of technology enablers and increasing levels of enterprise readiness has led to a growing number of organizations adopting, implementing and using mobile ICT in a wide variety of industries and contexts to varying extents [10]. The differences in these implementation levels can be generally attributed to where organizations place their view of enterprise mobility on the continuum (see Fig. 1) [3].

Some define enterprise mobility narrowly and tactically. In this view, point-solutions, such as mobile e-mail, dominate. These implementations tend to primarily focus on basic communication and productivity improvements. Others define enterprise mobility more broadly and strategically. In this instance, the focus is on strategic and large-scale enterprise wide implementations (e.g. mobile CRM) that enable organizations to create new core competencies, gain and sustain competitive advantages, and define new markets.

As the number of enterprises using mobile ICT increases, it becomes imperative to have a more complete understanding of what value and impact it has, what drives and enables it, and in what ways it can and will transform the nature and practices of work, organizational cultures, business processes, supply chains, enterprises, and potentially entire markets [4]. Enterprise mobility is therefore a topic of great interest to both scholars and practitioners [2].

Despite the importance of enterprise mobility as a topic area, the literature to date is relatively sparse [14]. Few papers have been published in premier management, information systems, engineering, and organization science journals. However, there are signs that this is changing. An online bibliographical database dedicated to the mobile business literature has emerged (www.m-lit.org) and some mobile communications journals (e.g. International Journal of Mobile Communications) have shifted their focus to include enterprise mobility related topics. An IEEE conference dedicated to mobile business was established in 2002 and has produced several research articles exploring issues related to enterprise mobility. In 2007, a research track on Mobile Enterprise and Workforce support attracted numerous papers that investigated technical, economic, and social issues of mobile ICT in enterprises. In summary, these activities provide an indication that there is a growing interest in the study of enterprise mobility by a broad community of scholars [11].

This volume aims to contribute to and extend both our *theoretical* and *practical* understanding of *enterprise mobility* by exploring the necessary strategic, technological, and economic considerations, adoption and implementation motivators and inhibitors, usage contexts, social implications, human-centered design issues, support requirements, and transformative impacts. The main objective of this

special issue is to discuss applications, technologies, strategies, theories, frameworks, contexts, case studies, and analyses that provide insights into the growing reality of enterprise mobility for scholars and practicing managers.

2. Papers in this issue

This volume contains thirteen articles from leading scholars and practitioners and can be broadly categorized into five sections. The first section provides an introductory view to the evolution of enterprise mobility; the second section examines the changing nature of work, work practices, and the work environment; in the third section of this special issue, critical enablers of enterprise mobility are discussed; in the fourth section, authors explore strategic considerations; the last section provides insightful case studies of enterprise mobility across multiple domains. Together, the articles explore enterprise mobility across the entire continuum.

2.1. *The evolution of enterprise mobility*

The first paper, “*The Convergence of Wireless, Mobility, and the Internet and its Relevance to Enterprises*” by Andrew Seybold of Seybold Consulting, provides an introductory perspective on the historical evolution of mobile ICT, how mobile ICT have traditionally entered the workplace, and how this process is changing. In particular, Seybold describes the implications of converged communications for enterprises and provides suggestions on how to manage new communication requirements in the age of mobility.

The mobile telecommunications industry is characterized by a complex value network of incumbent and emerging players [6]. The second paper, “*Business Mobility: A Changing Ecosystem*” by Mary McDowell of Nokia, provides a catalyst’s perspective on enterprise mobility solutions by exploring the structure and dynamics of the underlying business ecosystem, discussing the changing roles and relationships of key players, and projecting potential market growth opportunities. McDowell’s observations suggest that a number of changes are occurring and even more are necessary in order for enterprise mobility to evolve to the point of fruition, where companies consider mobile solutions as key strategic investments. McDowell concludes with several insightful vignettes of large companies that have made significant steps toward strategic and holistic adoption of enterprise mobility.

2.2. *The changing nature of work, work practices, and the work environment*

Recent research has called for a re-emphasis on the nature of work [1]. The introduction of emerging and potentially disruptive ICT, such as mobile ICT, into organizations particularly raises the question of its transformative impact on work, work practices, and the work environment [7,12].

In their paper “*A Socio-Technical Perspective of Mobile Work*”, Leida Chen and Ravi Nath from Creighton University explore the salient characteristics of an effective mobile work environment by applying a socio-technical perspective to the study of mobile work. Through a structured interview approach with chief information officers, Chen and Nath identify the primary elements of the social and technical subsystems related to mobile work. They conclude that both social and technical systems are highly interdependent and must be jointly optimized to create effective mobile work environments.

Camille Venezia, formerly with Knoll Workforce Research, and Verna Allee and Oliver Schwabe of Value Networks investigate the challenges of workspace design for evolving mobile workers needs

in the paper entitled “*Designing Productive Spaces for Mobile Workers: Role Insights from Network Analysis*.” The authors argue that only a few companies have developed strategies for mobile work that take physical space, mobile devices, and office equipment requirements into consideration. In many cases, costly mistakes in design and implementation have been made. Using value network analysis, Venezia and her colleagues define the specific roles mobile workers play, map the ways they interact with others and explore how this interaction impacts technology and workspace needs. Their study sheds light on popular “myths” of mobile work and provides valuable insight for technology providers, workplace designers, and managers.

The paper “*Telecommuting and Corporate Culture: Implications for the Mobile Enterprise*” authored by Anthony Hoang, Robert Nickerson, Paul Beckman, and Jamie Eng from the San Francisco State University re-examines the impact of corporate culture on telecommuting and explores its implications for the mobile enterprise. The study presents findings from a survey with managers and business professionals. Specifically, Hoang and his colleagues find that corporate culture is still a strong deterrent to telecommuting in many organizations. Their results have important implications for organizations moving towards enterprise mobility.

2.3. Critical enablers of enterprise mobility

As work spaces and settings change, technologies enabling enterprise mobility must take changing user requirements and evolving use contexts into consideration. Judith Gebauer from the University of Illinois, Urbana-Champaign, addresses this issue by investigating the salient functional and non-functional technology requirements of mobile professionals that lead to increased adoption, use and user performance in her paper “*User Requirements of Mobile Technology: A Summary of Research Results*.” Based on results of a series of research studies, the author concludes that (i) user-perceived technology maturity is a critical factor to explain and predict mobile technology use, (ii) users require basic communication and productivity-related functionality for particular tasks, and (iii) mobile technology has a considerable impact on job performance and personal life.

Given the unique characteristics of mobile devices, many design and use issues emerge that do not exist in traditional desktop systems. In the paper, entitled “*Mobile Interaction Design: Integrating Individual and Organizational Perspectives*”, Peter Tarasewich from Suffolk University, Jun Gong from Google, and Fiona Fui-Hoon Nah, and David DeWester from the University of Nebraska identify potential issues and problems with the design and use of mobile information systems by examining both personal and organizational perspectives of two critical enterprise mobility enablers, namely mobile devices and applications. Their study concludes with a set of guidelines that can assist organizations in making decisions about the design and implementation of mobile technologies and applications in organizations while taking user, data, security, and other contextual issues into consideration.

Mobile applications are one of the key enablers of enterprise mobility. In many instances, enterprises have simply extended their existing business applications to the mobile domain. More recently, mobile work specific applications have emerged. The paper, “*A Comparative Anatomy of Mobile Enterprise Applications: Towards a Framework of Software Reuse*” by Patrick Brans, formerly with Sybase, and Rahul Basole of the Tennenbaum Institute at the Georgia Institute of Technology, explores the rapidly evolving domain of mobile enterprise applications. The authors discuss how mobile applications have traditionally been developed and in what ways established software reuse principles can facilitate and enhance development. Brans and Basole suggest a methodology for identifying reusable mobile application components and develop a taxonomy of mobile applications, with a particular focus on field office applications.

In contrast to individual consumers, enterprises are much more concerned about the security of sensitive and critical corporate data. Given the inherent vulnerability of mobile devices and the data that resides on them, the success of enterprise mobility is largely dependent on providing adequate security levels. The paper “*Protecting Data on Mobile Devices: A Taxonomy of Security Threats to Mobile Computing and Review of Applicable Defenses*,” by Jon Friedman and Daniel Hoffman of Fiberlink, provides a broad overview of mobile device security, develops a multi-categorical threat taxonomy and discusses technologies and methods that can be applied against each threat type.

2.4. Strategic considerations

The mobile ICT landscape is complex, characterized by continuously evolving technologies and emerging standards. Organizations often face tremendous challenges when making strategic decisions in this uncertain environment [4]. Thus, a third theme that is important in understanding enterprise mobility relates to the plethora of strategic considerations firms and solution providers must take into account in order to successfully operate in this complex and dynamic environment.

Christina Loh, Andrew Stadlen, John Moses, and Conor Tuohy from Palm Enterprise and Rahul Basole from the Tennenbaum Institute at the Georgia Institute of Technology provide a unique empirical study on the determinants and challenges of enterprise mobility support in their paper “*Enterprise Mobility and Support Outsourcing: A Research Model and Initial Findings*.” The authors argue that the evolution of the wireless industry and the rapid proliferation of a mobile workforce has left many businesses at a disadvantage. Mobility support is highly complex and often given only little attention. Mobile network operators often tend to act as the primary point of support contact for enterprises. However, the support received is often below expectations and leaves businesses searching for alternate sources. Using a large-scale survey of executives and IT managers, Loh and her colleagues provide insight into what types of support strategies companies are pursuing and organizational receptiveness towards mobility support outsourcing.

The paper “*Enterprise Mobile Product Strategy using Scenario Planning*” by Sami Muneer and Chetan Sharma of SAP and Sharma Consulting, respectively, investigates the challenges companies face when evaluating enterprise mobility technologies. Muneer and Sharma argue that when planning for a long-term product roadmap, companies have to consider a myriad of evolutionary trends and forecasts to determine the probable list of product functionalities and their introduction timing in the lifecycle of the product. Drawing on the scenario-planning methodology, their paper suggests how to formulate a product strategy and roadmap.

2.5. Case studies

Eusebio Scornavacca and Stuart Barnes of the University of Wellington, New Zealand, and Norwich Business School at the University of East Anglia, respectively, examine “*The Strategic Value of Enterprise Mobility: Case Study Insights*.” Using the Mobile Enterprise Model, a framework for understanding the potential of mobile applications in organizations, Scornavacca and Barnes find that most organizations focus on process and mobility, rather than overall market impact. The primary benefits organizations gained included efficiency and effectiveness. Scornavacca and Barnes conclude that most organizations are merely in the empowerment phase and that there are significant opportunities for mobile enterprise applications to provide considerably more benefit for their organizations.

Carsten Sørensen, Jan Kietzmann, Gamel Wiredu, Silvia Elaluf-Calderwood, Kofi Boateng, and David Gibson from the London School of Economics conclude this volume with an excellent summary of lessons

learned through multiple case studies on the use of mobile ICT in enterprises in their paper “*Exploring Enterprise Mobility: Lessons From the Field.*” Sørensen and colleagues explore key challenges in the application of mobile information technology to improve organizational efficiency based on findings from 11 empirical studies. Their results indicate that there is not a clear linear relationship between the introduction of mobile ICT and the consequences in terms of increased organizational agility through enterprise mobility. Sørensen and colleagues also argue that the resulting benefits of mobile ICT are context-dependent and that organizations must carefully experiment to investigate how to yield the most benefit. The practical examples presented in the vignettes and discussed in the analysis provide management with excellent tangible examples of enterprise mobility placed in a theoretical context.

3. Conclusions

The emergence of mobile ICT within the enterprise has resulted in a paradigm shift of how business is conducted now and in the future. Business professionals, mobile workers, and field staff can now remain as productive outside the office as they are within the office. Mobile ICT provide workers the means to access and utilize work-critical data and information wherever and whenever they need it. However, these benefits represent only the tip of the iceberg. Enterprise mobility solutions have the potential to fundamentally transform organizations, supply chains, and markets.

As mentioned at the outset of this article, the literature on enterprise mobility is relatively sparse when related to the breadth and importance of the area. In order to address this gap, the material that follows purposely includes both practitioner and academic perspectives. Taken together, the thirteen articles in this special issue represent a significant step forward in our collective theoretical and practical understanding of enterprise mobility and set the stage for numerous future research opportunities.

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Rahul C. Basole is a Research Scientist in the Tennenbaum Institute at the Georgia Institute of Technology. His research focuses on modeling, visualization, and analysis of complex systems, innovation strategy and management, emerging IT, and applied decision analysis. In his current role, Dr. Basole conducts research on the complexity of value networks and eco-systems with a particular focus on the mobile business, healthcare, biotech, and services domain. Dr. Basole has received several best paper awards and his work has been extensively published in books, prestigious research journals, and conference proceedings. In previous roles, he was the CEO, Founder, and VP Research of a Silicon Valley-based wireless research and consulting firm, the Director of Research and Development at a leading software firm, and a Senior Analyst at a leading IT management consulting firm. Dr. Basole is a member of the Institute for Operations Research and Management Sciences, the Decision Sciences Institute, and the Association for Information Systems. He currently serves as a director or advisor for several technology

firms. He received a B.S. degree in industrial and systems engineering from Virginia Tech, has completed graduate studies in engineering-economic systems, operations research, and management information systems at Stanford University and the University of Michigan, and received a Ph.D. degree in industrial and systems engineering from the Georgia Institute of Technology, concentrating in IT and operations management.

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