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A Business Model Research Schema

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Abstract

This paper suggests a schema for business model research that has the potential to progress the research, in a structured manner, from conceptual to theoretical. It draws on the scientific and business research literature to identify the types of research necessary to further knowledge and promotes the inductive-deductive model of research. The importance of conducting empirical research to evaluate current conceptualisations of business models and developing a theory of business models is stressed.

An important aspect of any research agenda is the creation of a general classification of domain objects that can serve a wide range of current and future uses. Classification literature relating to the biological, behavioural, organisational and social sciences has been referenced in this paper in support of this claim. Existing classifications of business models are evaluated, determining that the only classifications that have been proposed to date are typologies and that no general taxonomy of business models currently exists.

1 Current Business Model Research

Consistent with the objectives of scientific research, the overall objective of business model research is to develop a theory of business models that can aid researchers and practitioners in explaining phenomena and making predictions. Theory development is an ongoing process that occurs over long periods of time, however business model research is in its very early days. The term itself only emerged towards the end of the twentieth century and the focus has been on defining business models and identifying the elements of business models (Pateli 2002; Pateli and Giaglis 2004; Osterwalder, Pigneur et al. 2005). What has emerged is an array of conceptualisations of business models that have been conceived from differing views of the problem domain and that are rarely grounded in existing theory (Porter 2001; Hedman and Kalling 2003).

Some definitions are quite abstract and outward looking (Timmers 1998; Hamel 2000; Weill and Vitale 2001; Hawkins 2002; Rappa 2006) whilst others are detailed and all encompassing of business functions (Chesbrough and Rosenbloom 2000; Mahadevan 2000; Dubosson-Torbay, Osterwalder et al. 2002). One of the explanations for this is that the definitions and the attributes of the business model are established according to the

business model's intended use and that they are not sufficiently grounded in theory (Hedman and Kalling 2003). Some researchers require the business model to form the basis of enterprise models and therefore include the internal workings of the organisation whereas others require the business model to focus on the relationships with external entities within their domain (Lambert 2003) . Pateli and Giaglis (2004 p 308) conclude that:

> …while some researchers perceive the business model as a purely business concept that explains the logic of doing business for a firm (Timmers 1998; Linder and Cantrell 2000; Petrovic, Kittl et al. 2001; Rappa 2003), others consider it as a link between strategy, business processes, and information systems (Nilsson, Tolis et al. 1999; Osterwalder and Pigneur 2002)

Progessing from research directed purely at defining business models and listing their components, some researchers have proposed conceptual models that illustrate the composition of business models and relationships between components (Alt and Zimmermann 2001; Amit and Zott 2001; Gordijn and Akkermans 2001; Osterwalder and Pigneur 2002; Hedman and Kalling 2003; Osterwalder, Pigneur et al. 2005).

Osterwalder, Pigneur et al. (2005), propose a business model ontology that draws extensively and systematically on the foregoing research. The ontology consists of four business model 'pillars' represented by nine business model elements. (See Osterwalder (2004) for a detailed discussion of the process.) This ontology was conceived with a view to creating 'concepts and tools that help [the] manager to capture, understand, communicate, design, analyze, and change the business logic of their firm' (Osterwalder, Pigneur et al. 2005 p.19) . The need for implementation tools such as this is recognised by Pateli and Giaglis (2004).

2 Overview of the Research Problem and the Business Model Research Schema (BMRS)

Business model research has been dominated by studies that propose business model definitions and components however "the research community is yet to invent a common language, in terms not only of terminology but basically in terms of conceptualization, for discussing and analyzing business models" (Pateli and Giaglis 2004 p.312). The conceptual nature of the research has resulted in there being a myriad of concepts, ontologies and frameworks of business models all of which have merit, but none of which have been universally accepted.

Hanks, Watson et al. (1993 p.11) recognised a similar problem in relation to research into organisational life cycle models. They concluded that due to 'the absence of careful empirical analysis, a plethora of conceptually based models have emerged', and that evaluation of the models can only be achieved through systematic empirical research.

Small enterprise and accounting researchers found themselves in a similar position a decade or so ago and recognised that progress would only be made through exploratory, inductive, empirical research (McMahon 1998).

In this paper a distinction is made between concepts and theories. 'Concepts are the building blocks of theory. A concept is an idea expressed as a symbol or in words' (Neuman 2003 p.44). '[Concepts] are used to communicate the essence of an observation' (Cavana, Delahaye et al. 2003 p33). A theory is 'a set of systematically interrelated concepts, definitions, and propositions that are advanced to explain and predict phenomena (facts)' (Cooper and Schindler 2000 p.51).

The objective of this paper is to propose a schema for research into business models that has the potential to progress future research towards a theory that can assist in explaining

and predicting phenomena in relation to business models. An important aspect of that schema is the creation of a general taxonomy of business models. In the following section the relevance of scientific research methods for business model research is discussed along with the role that classification plays in theorising. The differences between the specific and general classification schemes and between typologies and taxonomies are then explored along with an analysis of current business model classifications.

It is important to keep moving the research from conceptual frameworks to theoretical frameworks so that explanatory and predictive research, including the 'integrative challenges' proposed by Pateli and Giaglis (2004), can be undertaken. For this to occur an understanding of business model variables and their relationships with each other is required. The source of this understanding lies with the gathering and analysis of empirical data, specifically through the construction of a general taxonomy. Figure 1 illustrates a research schema that has been designed to incorporate both deductive and inductive research methods and depicts the overall goal of developing theories about business models.

Figure 1 depicts the six phases of business model research beginning with simple conceptualisations about business models and culminating in the development of theories of business models. Each phase is a necessary step in the progression of research and contributes something to the following steps. It is important to note that the steps are iterative; empirical findings cause a return to conceptualisations and inductive research feeds into future deductive research.

Phase 1: Early Conceptualisation of Business Models

Existing research into business models falls predominantly in this phase of research. The research consists of simple conceptualisations of business models including definitions, the identification of business model elements and typologies of business models.

Phase 2: Deductive Empirical Research

Very little empirical research has been conducted into business models. There have been small amounts of case study research and some application of typologies that represent deductive research. The conceptualisations have been used as the basis for classifying the data.

Phase 3: Developed Conceptualisations of Business Models

As a result of the deductive empirical research and new contributions to business research literature, the original concepts are developed and refined. Two types of research emerge from these developed concepts; further deductive research can be conducted (back to Phase 2) or inductive empirical research can be undertaken (Phase 4). It will be argued throughout this paper that it is necessary to undertake inductive empirical research in order to progress from conceptualisation and towards theories of business models. Deductive research serves to improve the business model concepts but cannot provide the basis for theory development.

Phase 4: Inductive Empirical Research

This phase consists of taxonomic research. The selection of variables for which data will be collected needs to be all encompassing. All relevant business model variables need to be identified thereby reducing the chance of omitting important data. Selection of the variables is based on the foregoing research, in particular the business model elements identified in the research conducted at Phase 3.

The data are analysed using quantitative data analysis techniques including multivariate analysis and a taxonomy is produced. The taxonomy will provide the means by which business models can be classified and named and relationships between variables can be

measured. The taxonomy will generate knowledge that can be used to refine the existing conceptualisations of business models (Phase 3) and to provide the basis of the next phase, namely Generalisations.

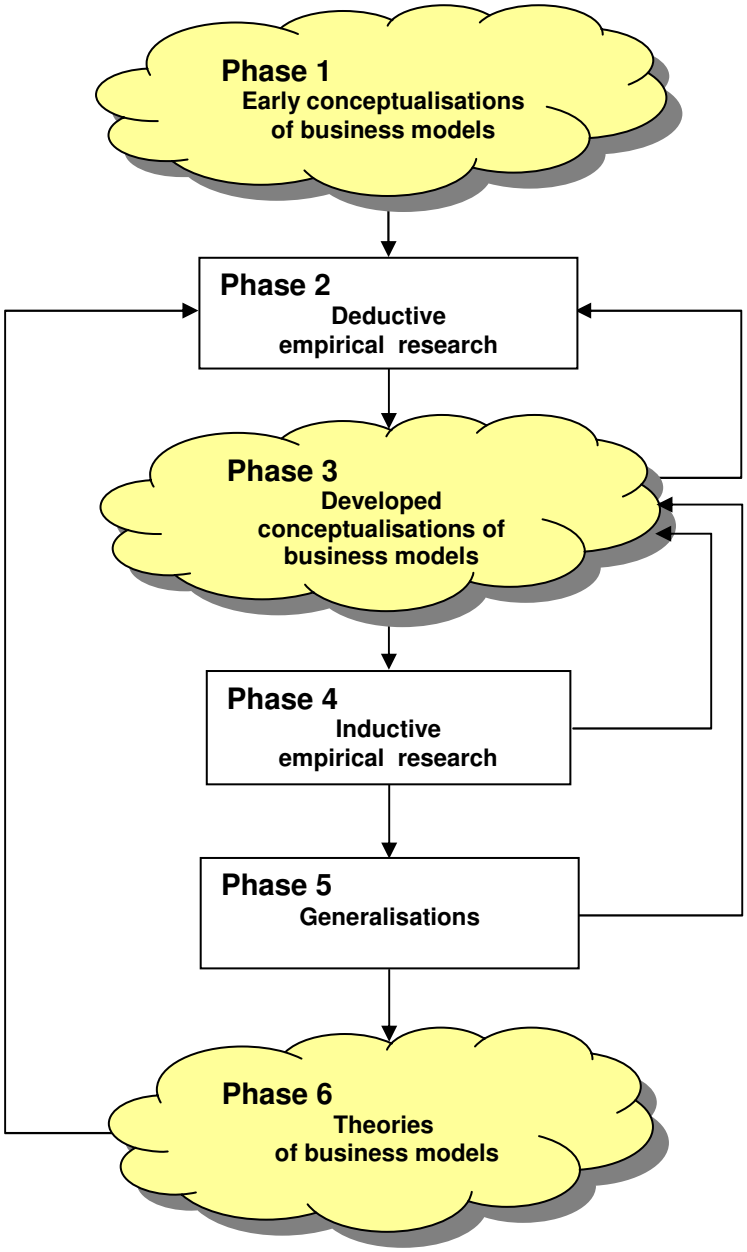

Figure 1: Business Model Research Schema

Phase 5: Generalisations

General patterns of configurations of business model variables can be inferred from the taxonomy. Simple relationships between variables can be hypothesised and tested. The generalisations will feed into Phase 6 forming the basis of a theory of business models.

Phase 6: Develop Business Model Theory

The aim of a theory is to 'present a systematic view of phenomena by specifying relations among the variables with the purpose of explaining and predicting the phenomena.' (Kerlinger 1974 p.11).

This research schema supports the notion that that theory development can only be achieved through sound inductive research. '…it is the intimate connection with empirical reality that permits the development of a testable, relevant, and valid theory' (Eisenhardt 1989 p.532). An inductively generated taxonomy of business models will provide the basis of theory generation. The following sections explain the roles of inductive and deductive research and the significance of the distinction between typologies and taxonomies.

3 The Inductive-Deductive Research Cycle

Research methods can be categorised in many ways but one that appears important in analyzing business model research is according to the direction of the reasoning process. Deductive reasoning begins with an abstract concept and then tests that concept with empirical evidence. Support for the concept is achieved if data collected from observations are consistent with the proposed concept.

An example of deductive research into business models is Weill and Vitale's (2002) study of IT infrastructure focus in each of their atomic business model classes. In prior research, Weill and Vitale conceptualised eight different business model types which they called 'atomic business models'. They then hypothesised that the IT requirements of each atomic business model would be different. To test this concept they conducted empirical research in the form of interviews with senior managers to ascertain the atomic business models being implemented and the IT infrastructure focus. The data were analysed, and it was deduced that each atomic business model had a different IT infrastructure focus.

Inductive research on the other hand creates grounded theory by beginning with data collection and then making generalisations and inferring theories based on the observations (Cavana, Delahaye et al. 2003; Neuman 2003). Inductive research should begin with no preconceived ideas of what will be found.

> …theory-building research is begun as close as possible to the ideal of no theory under consideration and no hypotheses to test…investigators should formulate a research problem and possibly specify some potentially important variables, with some reference to extant literature. However, they should avoid thinking about specific relationships between variables and theories as much as possible, especially at the outset of the process (Eisenhardt 1989 p.536).

An inductive research question might be, 'What business model attributes are associated with various IT infrastructure foci?'

Sound scientific research requires a combination of inductive and deductive methods to advance knowledge. The Scientific Revolution, that took place around the end of the fifteenth century, 'linked the rational and the empirical, thought and fact, theory and practical experiment.' (Bronowski 1951 p.31). What this means is that knowledge is advanced by performing deductive research based on the results of the inductive research and that these steps require iteration.

Ghent (1966) suggests that experimental design in the biological sciences begins with 'guesswork' or a concept based on existing knowledge of the researcher. This concept forms the basis of the design of empirical experiments from which the original concept

can be modified (deductive research). The modified concept (the result of deductive research) should be more realistic than the original concept and will form the basis of inductive research.

This inductive-deductive cycle provides the means by which concepts can be developed into theories. To be of value, research must progress from being descriptive and conceptual to being explanatory and predictive. It must move from conceptual frameworks towards theoretical frameworks. The goal of natural science, according to March and Smith (1995 p.253), is to develop theories that 'provide deeper, more encompassing, and more accurate explanations [of reality]'. This goal is equally relevant to the social sciences and to business model research.

The Business Model Research Schema (BMRS) incorporates both deductive and inductive research methods and reflects the iterative nature of the process and the progression towards theory development.

4 The Need for a Business Model Classification Scheme

To advance from concept to theory, it is necessary to order or classify the objects within the domain. 'Classifications are partway between a simple concept and a theory. They help to organise abstract, complex concepts' (Neuman 2003 p.46). Business models are abstract, complex concepts of which understanding can be enhanced through the development of a general classification scheme.

Classification involves the ordering of objects into groups or classes on the basis of their similarity (Bailey 1994). This ordering of objects into classes provides meaning to reality (Simpson 1961). It also aids our understanding of a domain as '…we do not perceive, remember and talk about each object and event as unique, but rather an instance of a class or concept that we already know something about' (Smith and Medin 1981 p.1).

Just as recognition of similarities and differences among objects and classification of objects are fundamental steps in the development of childhood reasoning (Piaget 1973) the recognition of similarities and differences between business models and the development of classes of business models are fundamental to business model research.

In all forms of scientific research, including social science research, classification of objects within the domain is an important step towards other research (Mezzich and Solomon 1980; McKelvey 1982). A good classification scheme forms the foundation of theory development. 'Theory cannot explain much if it is based on an inadequate system of classification' (Bailey 1994 p.15).

Bailey (1994) identifies ten advantages of a good classification scheme:

1. Provides an exhaustive and perhaps even definitive array of types or taxa.
2. Reduces complexity and achieves parsimony.
3. Identifies similarities among objects and allows a group of objects to be analysed at the exclusion of other, more diverse objects.
4. Identifies differences so that dissimilar objects can be separated for analysis.
5. Presents an exhaustive list of dimensions or characteristics.
6. Allows types of objects to be compared.
7. Manages and takes stock of types of objects.
8. Enables the specification of hypotheses concerning relationships between classes of objects through the creation of typologies and then identification of empirical cases.

9. Types can be used as criterion for measurement. One type can be used as the reference point and others can be measured relative to that criterion.

10. Provides versatility, i.e. suits many needs and can display different aspects of the data.

A good classification scheme organises objects according to their place within the problem domain and depicts relationships between objects. Gilmour is of the belief that 'The primary function of classification is to construct classes about which we make inductive generalisations' (Gilmour 1951 p. 401).

5 Typologies and Taxonomies

Classifications may be designed to serve multiple purposes or very specific purposes. Those that serve many purposes and provide more meaningful generalisations are referred to as natural or general classifications and those that serve specific or few purposes are referred to as artificial or arbitrary classifications (Simpson 1961; Sokal and Sneath 1963).

McKelvey (1982) in discussing organisational systematics, recognises two basic classification schemes; special classifications and general classifications. Special classifications focus on only one or a few attributes of interest. They are developed with a special purpose in mind and therefore have limited utility. In contrast, general classification schemes attempt to group objects based on all of their attributes.

Another important distinction in classification schemes is between typologies and taxonomies although many researchers use the terms interchangeably. Understanding the differences between taxonomic research and typological research is important because it will be seen that they serve different purposes and have their own limitations and strengths.

5.1 Typologies

Typologies are a product of deductive research. The researcher conceptualises the types that are relevant to the research. These types form the cells of the classification scheme and each cell is labeled (named). The researcher then identifies cases that possess the characteristics deemed essential to fit the cells.

The great advantage of typologies is their ability to simplify complex concepts by classifying objects according to a few, often two, criteria at a time. Furthermore '[a] sound typology forms a solid foundation for both theorising and empirical research' (Bailey 1994 p 33).

Typological research does however have its limitations. Hambrick (1984 p.28) points out that:

> typologies represent a theorist's attempt to make sense out of non-quantifiable observations…they are largely the product of rather personal insight, they may not accurately reflect reality. Or more likely they may serve well for descriptive purposes but have limited explanatory or predictive power.

Typologies are specific classifications rather than general classifications. They serve limited purposes, therefore it is conceivable that over time a large number of typologies will be developed, each capable of serving a specific purpose.

Typologies are mostly generated through qualitative classification rather than quantitative or statistical analysis (Bailey 1994). Bailey (1994) points out however that typologies

can be formed through conceptualising the types and then using cluster analysis to quantify the empirical findings.

5.2 Taxonomies

Taxonomies, in contrast to typologies, are generated from inductive research, derived empirically (Sokal and Sneath 1963) through multivariate analysis (Hanks, Watson et al. 1993). The researcher creates grounded theory by first collecting the data and then generalising to the abstract or conceptual. 'A taxonomy begins empirically, rather than conceptually, with the goal of classifying cases according to their measured similarity on observed variables.' (M S Lewis-Beck, Series Editor in Bailey 1994 p.v). Unlike typologies whereby the categories are derived conceptually, taxonomic categories are derived through cluster analysis.

The term taxonomy, like classification, can be used to refer to a process and the end result. 'Taxonomy [the process] is the theoretical study of classification, including its bases, principles, procedures and rules' (Simpson 1961 p. 11).

Taxonomic research involves the identification of a large number of variables on which to gather data. Determination of these variables must be based on existing domain knowledge that has been generated through deductive research. The data are analysed using multivariate analysis to identify the natural groupings (classes). The aim is to minimise within group variance and maximise between group variance thereby creating homogeneous groups. Once these homogeneous groups are created they can be used for a multitude of research applications; within group behaviour can be studied as well as inter-group behaviour.

5.3 The Role of Typologies and Taxonomies in the BMRS

Both typologies and taxonomies have a role to play in the BMRS but it is important that their output is applied appropriately. Table 1 summarises the differences between typologies and taxonomies and their role in the BMRS.

Table 1: Summary of differences between Typologies and Taxonomies

Typologies	**Taxonomies**
Falls within Phase 2 on the BMRS	Falls within Phase 4 of the BMRS
Specific/arbitrary/artificial classification	General/natural classification
Derived conceptually	Derived empirically
Form of deductive research	Form of inductive research
Reasoning by deduction	Reasoning by inference
Few characteristics considered	Many characteristics considered
Mostly qualitative classifications	Quantitative classifications
Provides a basis for only limited generalisations	Provides a basis for generalisation

In terms of the BMRS, typologies are produced at Phase 2 providing input to refine conceptualisations of business models and as foundations for identifying relevant business model variables for future inductive research. Each typology will add something to the business model knowledge base however, because they are specific classifications (as opposed to general classifications), consolidation of the research findings will be difficult, if not impossible.

The generation of a business model taxonomy through inductive research falls within Phase 4 of the BMRS. The taxonomy would provide a basis for classifying business models according to their degree of affinity; in other words, according to the extent of similarity of all their characteristics. As new instances of business models are incorporated into the database the taxonomy can be updated. This classification scheme will be self-adjusting over time. As the data is added to or changed and the analysis reperformed, the resulting classes will change.

6 An Analysis of Existing Business Model Research Using the BMRS

It was recognised by early business model researchers (Bambury 1998; Timmers 1998; Rappa 2006) that an understanding of business models requires some form of classification. The problem is that the early classifications were based on nothing more than anecdotal evidence and conceptualisations of business models (Hawkins 2002).

More recently case study research has been undertaken in an attempt to support conceptualisations of business models (Osterwalder, Pigneur et al. 2005). Typological research across industries (Weill and Vitale 2002; Weill, Malone et al. 2005) and within industries (Ballon 2004; Leem, Suh et al. 2004) add to the body of knowledge and assist in the identification of potential variables for future data collection. Currently there exists no taxonomy of business models (Osterwalder, Pigneur et al. 2005; Weill, Malone et al. 2005).

Pateli and Giaglis (2004) provide a comprehensive analysis of the business model literature classifying it into the following eight 'sub-domains of research'.

- Definitions
- Components
- Conceptual Models
- Design Methods and Tools
- Taxonomies
- Change Methodologies
- Evaluation Models
- Adoption Factors

In terms of the BMRS proposed in this paper the 'Definitions' and 'Components' research clearly fall into the Early Conceptualisations Phase (Phase1) of the BMRS. It could be argued that the remaining sub-domains fall into Phase 3 since they are built on the earlier research, however some of this research could be classified as early conceptualisations and also form part of Phase 1. Although Pateli and Giaglis (2004) call one of their sub-domains 'Taxonomies' they state in the description of the sub-domain that it consists of various typologies of business models. The research referred to consists of conceptualisations of typologies which therefore fall into Phase 1 of the BMRS. Pateli and Giaglis (2004) acknowledge the need for, but the lack of, a general taxonomy of business models.

Like Pateli and Giaglis (2004), Osterwalder et al. (2005) have provided a detailed analysis of existing business model research. Three categories of business model research are presented in a hierarchy referred to as a Business Model Concept Hierarchy. It describes the relationships between business model definitions and meta-models, the classifications of the meta-models into business model types, and the identification of existing instances of the business model types.

Depending on the level of concept development, the definitions of business models and the creation of meta-models represent Phase 1 or Phase 3 research of the BMRS. Osterwalder et al. (2005) use the term 'taxonomy' to refer to different meta-models, however it is in fact a typology of meta-models and therefore forms part of Phase 3 of the BMRS.

The third level of Osterwalder et al.'s (2005) Business Model Concept Hierarchy consists of identifying instances of business models types. This is a form of empirical research that aims to support the conceptualised meta-model types and is therefore deductive research and an example of Phase 2 of the BMRS.

Osterwalder et al. (2005) also provide a five phase evolution of business model research. The first three phases, being business model definitions, classifications, component identification and description, are all part of the BMRS Phase 1, early conceptualisations of business models. The fourth phase of Ostwalder et al.'s (2005) evolution model represents developed conceptualisations (Phase 3 of the BMRS). Osterwalder et al. (2005) state that some empirical testing was carried out during this phase. This testing is considered to be deductive rather than inductive and is therefore equivalent to Phase 2 of the BMRS. Osterwalder et al.'s (2005) fifth phase is the application of the research to IS and management applications. This phase does not form part of the BMRS since it does not represent scientific research, rather it is the application of the research.

The only evidence of inductive research (Phase 4 research) uncovered in the literature is the case study research conducted by Amit an Zott (2001). Amit and Zott (2001) proposed an e-business model grounded in entrepreneurship and strategic management theory. Through inductive, empirical case study research Amit an Zott (2001) mapped their business model components of structure, content and governance, against their proposed sources of value creation (efficiency, complementarities, lock-in and novelty). This empirical research is a useful contribution to the development of theories of business models although it does not contribute to the creation of a business model taxonomy.

7 Summary

The BMRS presented in this paper captures the essence of the Scientific Revolution. Essentially it suggests a combination of deductive and inductive research methods be employed to build empirically on existing concepts of business models and progressively refining those concepts to the point where theories of business models can be proposed.

To date, research into business models has been conceptual and any empirical research has been deductive. On close examination it has been established that the existing 'taxonomies' of business models are in fact typologies and are of limited and very specific use. There exists no general taxonomy of business models largely because there is no widely agreed upon concept of a business model. However this should not act as a barrier to the process and at some point the conceptualising must give way to inductive research.

The inductive research will give rise to new conceptualisations and eventually to theories of business models. The BMRS emphasises that the research phases need to be iterated, each iteration providing more knowledge to improve the next. It is not expected that the first taxonomy of business models will be complete, but it will add to the existing body of

knowledge and improve conceptualisations of business models through inference. 'A classification scheme, like a good theory, is seldom finished. It is only given interim acceptance with the understanding that further studies will tend to elaborate and refine it, or disconfirm it' (McKelvey 1982 p.30).

This paper suggests a structured research agenda to take the current deductive research efforts towards theories of business models by developing a general taxonomy of business models. It is only through sound, grounded theory development that explanatory and predictive questions can be answered.

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