



Assessing business model concepts with taxonomical research criteria

A preliminary study

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Assessing
business model
concepts

735

Abstract

Purpose – The purpose of this paper is to synthesize taxonomical criteria that can be used for assessing research constructs and assess current business model conceptualizations. The paper attempts to show how the criticism plaguing current business model conceptualizations could be removed with future conceptual development against these taxonomical criteria.

Design/methodology/approach – The paper synthesizes taxonomical criteria and assesses current business model conceptualizations.

Findings – The results of the paper revealed that the current business model concepts comply poorly with the taxonomical criteria. The assessment of taxonomical compliance in this paper exposed major opportunities for enhancements in the existing conceptualizations of business model.

Research limitations/implications – The findings of the paper outline novel avenues for future research in developing more coherent and rigorous business model conceptualizations.

Practical implications – The practical implications of the paper are that current conceptualizations of a business model are at best incommensurate and at worst even misleading. This paper presents criteria that may be used in guiding the necessary caution and careful deliberation when practical application of the current business model conceptualizations is enforced.

Originality/value – The paper is original in that it establishes the taxonomical criteria, which may be used in research seeking to develop more sound and rigorous business model conceptualizations. To advance this new field the paper concludes that the taxonomical criteria can aid in the future research endeavors to design relevant business model conceptualizations.

Keywords General management, Business development, Business enterprise

Paper type Research paper

Introduction

In the generation of above industry norm economic returns, ventures arising from technological potential through development activities must assemble the necessary resources for capitalizing on the created business opportunity. In addition, ventures need to find means also to appropriate at least some of the economic returns generated in the ventures (Alvarez and Barney, 2004). The combination of the above tasks of assembling and appropriating, required the linking of operations and venture strategy to one-another. Therefore, the question of how to organize for the creation, capturing and appropriation of the economic returns in ventures is of crucial importance in current business research.

Business model concepts have been proposed to provide a link between strategy and operations. As aids in combining value creation from business potential through research and development (R&D) and operations with value appropriation through strategic maneuvering, business models have attracted a significant amount of attention in practice and an increasing interest in various research disciplines in the



recent years. The purpose of the business model concept has been defined by emphasizing value creation as a part of managing technology development as:

The business model... is thus conceived as a focusing device that mediates between technology development and economic value creation (Chesbrough and Rosenbloom, 2002).

Similarly, the business model concept has been positioned between inputs used by a firm or venture to gain economic outputs in current research (Afuah, 2004; Davenport *et al.*, 2006; Osterwalder and Pigneur, 2004). The concept of a business model attracted significant attention in the late 1990s as part of e-commerce and the closely associated Internet bubble.

Business models gained reputation especially as a part of venture creation literature of the 1990s. These models were designed to be used as aids in utilising an opportunity. With the bursting of the dot.com bubble in 2000, the business model concept suffered from a short period of inflation but has since maintained its use among practitioners and gained increased academic attention (Magretta, 2002). In order to briefly test the current state of the business model concept and therefore, its relevance for both practitioners and researchers, we conducted key word searches for the exact term "business model" on January 16, 2007. The yearly amount of articles citing "business model" in the web-sites of the popular press and in the ABI/INFORM are presented in Table I.

Previous studies suggest that the business model concept could serve as an intermediate object of analysis between the resource configuration and strategy in venture creation. This provides the missing link between strategy and operations in exploiting entrepreneurial opportunities (Amit and Zott, 2001; Hedman and Kalling, 2003; Shafer *et al.*, 2005). Venture creation necessarily creates a need to build, arrange and configure resources in order to fulfill the potential and achieve sustainable competitive advantage (Noda and Collis, 2001; Wernerfelt, 1984). Most notably in the context of business models, Amit and Zott (2001) called for integration of the various frameworks in examining value creation potential in ventures "for the linking of strategic management and entrepreneurship theories of value creation".

However, such an integrating concept is necessarily based on multiple domains, as reflected in the criticism that business model concepts have received. The criticisms have addressed, for example, the unclear definitions assigned to business models (Joyce and Winch, 2004; Seddon *et al.*, 2004), the opinion that the concept is underdeveloped (for example, Chesbrough and Rosenbloom, 2002; Magretta, 2002) and

Popular press Magazine	Hits	Academic: ABI/Inform	
		Year	Hits ^a
<i>Business Week</i>	1,870	1998	30
<i>Forbes</i>	1,073	1999	48
<i>NY Times</i>	1,528	2000	85
<i>Washington Post</i>	1,034	2001	117
		2002	138
		2003	176
		2004	261
		2005	292
		2006	277

Table I.
The quantitative
evolution of the term
"business model" in
selected sources

Note: ^aScholarly journals, multiple databases

the concept is not theoretically grounded (Porter, 2001). Therefore, the business model concept has faced similar criticism as has been laid upon the management research in general lately (see Smallman, 2006).

Nevertheless, this criticism has been neglected to a large part in existing studies in terms of the substance of current business model concepts, although the contemporary conceptualizations are seeking to tackle it. In this paper we synthesize existing taxonomical criteria and present a critical assessment of current business models. Our purpose is to assist future research in its endeavor finding relevant, yet rigorously crafted conceptualizations of the business model concept.

Theoretical foundations

The purpose of the business model concept has been defined earlier by emphasizing value creation as a part of managing technology development (Chesbrough and Rosenbloom, 2002). Their definition is consistent with contemporary research that has positioned the business model concept between inputs used by a firm to gain economic outputs (for example, Afuah, 2004; Davenport *et al.*, 2006; Osterwalder and Pigneur, 2004). Therefore, the business model concept has been designed to provide a linking concept in managing creation of entrepreneurial rents from technological potential and entrepreneurial rent appropriation from the created economic value.

Chesbrough and Rosenbloom (2002) outline the premises for the business model concept by tracing the concept in the strategy literature from Chandler (1962) to the dominant logic of Prahalad and Bettis (1986) and the technology management literature on capabilities (Henderson, 1994; Tripsas, 1997). Similarly, Amit and Zott (2001) and Hedman and Kalling (2003) have traced the business model concept back to its origins in strategy literature. From these premises, the business model concept has evolved to incorporate value creation, value capturing and value appropriation. Defining the domain of the business model, between value creation and capturing, is also inherent in the definitions.

Business models have been referred to as business practices, receiving efficiency gains from the usage of information technology (Chapman *et al.*, 2003) as well as an abstract identification of how a business operate profitably (Betz, 2002). Despite the differences in these definitions, a business model has been defined in the realm of value creation as an aid in designing transaction content, its structures and governance in the exploitation of business opportunities (Amit and Zott, 2001). This further ties the concept closely to value appropriation.

In addition, the above definitional domain significantly overlaps with contemporary definitions within the domain of strategy (e.g. Chesbrough and Rosenbloom, 2002; Hambrick and Fredrickson, 2001). Capturing value and, especially, ensuring its sustainability has been well built into the strategy discourse. Attempts at disentangling strategy from business model concepts have proven especially difficult (Shafer *et al.*, 2005).

However, three key differences have been proposed for distinguishing the two from each other (Chesbrough and Rosenbloom, 2002). Firstly, the business model is based on value creation for the customer, whereas an emphasis on capturing that value and sustaining it lies within the scope of strategy. Secondly, financing for value creation is implicitly assumed in business models, whereas the strategy explicitly addresses issues concerning the financing of value creation, owing to the underlying assumptions of shareholder value creation. Finally, the third difference is derived from the assumptions about the state of knowledge held by the firm and its stakeholders.

Business models explicitly assume limited or distorted information and knowledge, whereas strategies are built on analysis and refinements in knowledge, thereby assuming the existence of reliable and plentiful information to be transformed into knowledge. On the other hand, since the business model provides a link between strategy and operations, it needs to be integrated into value creation as well as strategy concepts. This view is emphasized in the definition of Chesbrough and Rosenbloom (2002), wherein the business model is depicted as a construct mediating between technology development and economic value creation. Their definition is more bounded and limited, giving guidance on the functions of a business model concept. At the same time, it is well in line with other authors who have positioned the business model concept between inputs used by a firm to gain economic outputs (for example, Afuah, 2004; Osterwalder and Pigneur, 2004).

Thus, the strategy of a venture or an organization is concerned more with value capturing and its sustainability than with value creation, while a business model should be concerned with integrating sustainable value creation with capturing and appropriation. This, however, does not include definitions on functions that the business model concept should perform in fulfilling its definitional purpose.

Chesbrough and Rosenbloom (2002) offer a detailed and operational definition concerning the functions of a business model. In order to integrate value creation, capturing and appropriation, the business model should:

- articulate the value proposition and its relation to intended market segment;
- define the value chain of the firm required to create and distribute the offering outlined in value proposition;
- determine the complementary assets needed to create the offering and support its position in the value chain;
- position the firm within the value network context, including identification of potential complementors and competitors;
- estimate the cost structure and profit potential associating the business model concept to value creation; and
- formulate the means whereby a firm will gain and hold an advantage over its rivals linking the business model concept to strategy.

Convergence of a business model concept and its domain is accentuated by recent research emphasizing integration of strategy and operations (e.g. Davenport *et al.*, 2006; Tikkanen *et al.*, 2005). Also Shafer *et al.* (2005) present a synthesis tying a business model concept to both value creation and strategy in four broad categories of strategic choices, the value network, creating value and capturing value.

Objective and method

The most fundamental of tasks in all forms of science is the classification, listing, ordering or other grouping of the objects under investigation into constructs (Carper and Snizek, 1980; Crawson, 1970). The basic step in assessing the constructs created is to subject the concepts to taxonomical investigation. Taxonomical study evaluates the properties of classification schemes used in classifying objects into groups, thereby focusing on general principles describing the objects of interest (Scherpereel, 2006). Hierarchical classification facilitates the presentation of elements and the properties of phenomena under investigation in such a way that hypotheses may be developed in

terms of research objects (Cormack, 1971). Phenomena can also be classified, grouped and clustered in a way that facilitates their comparisons. In addition, models cannot only be constructed between theory and reality but also act as communication devices (Skyttner, 2001).

The purpose of modeling is to distil reality into understandable constructs, further facilitating the understanding of the phenomena under study, and aiding in hypotheses construction and theory development. The purpose of the model is to outline an appropriate and theoretically limited set of objects and relationships between them. Models can be descriptive, explanatory or prescriptive (Skyttner, 2001). From the modeling perspective, explanatory and prescriptive models are essentially causal models describing relationships and their directions between objects. Conceptual frameworks or listings of objects that differentiate research subjects from one another are not considered as models in this study, since they do not facilitate modeling purposes. These frameworks either lack hierarchy or do not describe relationships between the objects in the framework.

Models are fundamentally classification systems that may or may not create relationships between the objects from which they are constructed. Thus, as a classificatory scheme, a model and the objects of the model can be subjugated to a taxonomical assessment. Taxonomy can refer to both the process and end result (Bailey, 1994, p. 6). In this study, we refer to taxonomy as a process occurring when analyzing a certain research subject (that is, a business model). A similar approach has been traditionally used in biology (e.g. Mayr, 1981) as well as in other fields including Chrisman *et al.* (1988) in strategy research and McKelvey (1975) in organizational classification.

The objective of this paper is to assess existing business models as theoretical constructs. The formulation of criteria for taxonomical analysis is based on the basic rule of classification:

The criteria formed and used for assessment must itself be both exhaustive and mutually exclusive (Bailey, 1994, p. 3).

An iterative process of formulating criteria led to nine criteria. Models are assessed at two levels of the classification: system (i.e. model) and items (i.e. objects). The first six criteria describe attributes of a model:

- (1) Mode of inference;
- (2) Level of analysis;
- (3) Generalizability;
- (4) Hierarchy;
- (5) Collective exhaustiveness; and
- (6) Parsimony.

The criteria are explained in detail below.

Attributes of a model

Mode of inference

Inference can be either descriptive or causal. If the relationships of objects are presented, we consider the model to be causal. When a model only depicts the entire model as a system, it is regarded as descriptive (King *et al.*, 1994).

Level of analysis

This criterion explains whether the observer concentrates on the entire model or only a part of the entirety. This is directly linked to the definition and the tasks defined for the business model concept. Assessment is made against these definitions, and this criterion depicts the level at which a model has explanatory power. The more fine-grained a model is, the more detailed explanations it may offer. There are four possible levels: the entire system level (the big picture); the element level, explaining objects that form entire system; the sub-element level, explaining how the objects are divided into sub-objects; and the component level, operating on the level of identifiable objects like resources and capabilities (Moul, 1973; Murmann and Frenken, 2005; Singer, 1961).

Generalizability

This criterion evaluates how a model may be generalized across differences in context and time. If the output of a model is not dependent on its context or time (where and when it is utilized), it can be generalized. Otherwise, a model is not generalizable (Morris *et al.*, 2005).

Hierarchy

This criterion is needed in order to tackle the entirety rather than its parts. This is once again assessed against the definition and the tasks of the business model concept. The definition itself requires a model and has to have an entirety as a modeling object. It allows different levels of elaborateness in the examination of the research subjects based on the requirements of different research settings. Additionally, it enables generalizations to be made at different levels of detail. When the model describes the relationships between subsystems and elementary subsystems, then our assessment of the criteria is yes. In all other circumstances, we conclude that the model does not contain hierarchical structure (Bailey, 1994; Skyttner, 2001).

Collective exhaustiveness

Another criterion for all taxonomies and classifications is that they should be constructed to ensure that no research subjects remain unclassified. This criterion is assessed against the definition and the tasks synthesized from current literature. The characteristics and "goodness" of a model are assessed against the overall purpose of the business model. In addition to horizontal exhaustiveness, a model must possess explicit vertical links both upwards to a firm strategy and downwards to operations (see the above synthesis of definition and functions of business model) (Chrisman *et al.*, 1988).

Parsimony

The objective of all classifications is to utilize as few objects as possible. The characteristics of the research subjects – according to which classification is conducted – must be as few as possible in order to allow simple and straightforward classification. When this is the case, our assessment results in a "yes" answer. However, if a researcher can find the possibility to use fewer objects, and the model has collective exhaustiveness, the answer is "no". If other dimensions are covered by the model, the answer must also be "no". Parsimony cannot be assessed when a model is not collectively exhaustive (Beck, 1943).

In addition to assessing business models at the system level, we also judged constructs at the level of objects of models (that is, taxa) using the three criteria of

mutual exclusivity, internally homogenous and representational naming, which are detailed below

Attributes of taxa

Mutual exclusivity

A subject must belong to one taxon and one taxon only. This also enhances the parsimony of the taxonomy. This criterion is dichotomous. If a model exists only at the system level, the mutual exclusivity of the taxa cannot be evaluated (Bailey, 1994).

Internally homogeneous

There must be at least one property which is required of a research subject for it to be assigned membership in a certain taxon, and all the research subjects that do not possess this property must be excluded from this taxon. This criterion emphasizes the hierarchy of a classification. When no hierarchy exists, all elements or components must be assessed to ensure that all research subjects are thematically placed in the correct places. Otherwise, the lowest hierarchical level of the model is assessed in a similar fashion (Chrisman *et al.*, 1988).

Representational naming

This criterion evaluates the ability of the model to communicate: Is a model invariant from the background of its user? The naming convention should distinguish individual parts of the business model from one another. Thus, it should be representative in terms of the content of that part. The naming convention should also discriminate taxonomies from one another (Coley *et al.*, 1997, 2004, McKelvey, 1975).

Our selection of criteria has few interdependencies as delineated in the above definitions, although it would be beneficial to have independent criteria to consider multiple aspects of the models under study independently. By further explicating interdependencies, we seek to outline the purpose of the criteria used for the assessment as a holistic set.

Selection and description of the sample

Based on prior studies of methodological issues in strategic management (Boyd *et al.*, 2005), we identified three characteristics that our sample should fulfill. Our sample should be based on a range of journals, it should have temporal extensiveness and it should have a clear and transparent sampling procedure. For a young multidisciplinary field of inquiry, the sample selection is especially challenging. We expected to find studies dealing with business model concepts both in the top tier as well as in less prominent sources, where many experimental developments take place.

Thus, our initial literature review covered all scholarly studies in which the term "business model" was mentioned in order to carry out an exhaustive assessment. To ensure the relevance of our sample, we sought scholarly papers from journals established and verified in earlier literature (for example, Boyd *et al.*, 2005; Tahai and Meyer, 1999), as well as in a number of journals from constrained fields of inquiry, including technology and innovation management, operations management, accounting, e-commerce and information systems management. In addition to searching widely within journals, we also employed searched general databases and electronic sources such as ABI/INFORM, SpringerLink and Elsevier Science Direct. Similarly, we looked for cues for studies in search engines in order to track developments in business model research.

The second characteristic that we imposed on our sample selection concerned the time frame. In our initial data gathering for the literature review, we found that the term “business model” had only recently been adopted by the wider scientific community and its use in research setting started to expand rapidly in the end of 1990s (see Table I). This we interpreted as signifying the general acceptance of the term and, therefore, an appropriate starting point for our temporal sample selection. Since the business model concept has undergone much progress and evolution in the last years, our sampling was extended to the recent articles (that is, until the end of 2005). Thus, it was decided to limit our sample selection to cover the period extending from 1998 to 2005.

From this sample, we selected those original studies that had undergone a review process, thereby excluding commentaries, book reviews, conference papers, white papers, research reports, working papers and other similar works. Using the above inclusion criteria, we arrived at our base sample for analysis. This initial sample consisted of 495 studies.

From the initial sample, we further narrowed our sample size using the following selection procedure. First, we excluded from the sample those studies that did not consider the definition and structure of a business model concept but merely made reference to the concept. This represented a significant body of studies. Secondly, we excluded studies that attempted to approach the business model concept as a definitional or structural framework, either from a specific discipline and approaching general definitions or by approaching the definition of the business model concept from a general point of view and applying it to a specific domain. Thirdly, those studies, which were targeted to business process modeling, were excluded from this study, since these studies mainly report on results that are oriented less toward the business model concept itself than toward approaches to process modeling. Finally, to further narrow our sample, we selected only those studies that were explicitly targeted at defining the business model concept and the tasks and functions of a business model, or considered the business model concept from a modeling perspective (i.e. seek to build a model rather than listing ways of doing business or the attributes of a concept). The authors made the decision concerning inclusion of a study in our sample, after rounds of individual assessments, multiple discussions and final agreement on inclusion.

Thus, when assessing models as theoretical constructs, we had to exclude those studies that did not focus on developing a discipline by tackling the business model construct as elaborated above. This facilitated a limited but thorough appraisal which was considered appropriate for investigation of paradigmatically new fields of study with theoretical and methodological diversity (for example, Pfeffer, 1993). The final sample consisted of 13 studies ($n = 13$). The authors individually assessed the models against the taxonomical criteria and formulated individual assessment results. The results were then discussed among the researchers and corrections were individually made to the results based on the discussions. After rounds of individual assessments and discussions, we finally arrived at agreement on the assessment results.

Results and discussion

Business model concepts were assessed with the methodology and data described above to shed light on the stage of development in this young field of inquiry. The results of our assessment are summarized in Table II.

Assessment of the business model concepts at the model level reveals that both causal and descriptive models are present in our sample. As can be seen in Table II, eight of the 13 models are descriptive in nature, rather than causal representations

Clusters	Authors	Model							Taxa	
		1	2	3	4	5	6	7	8	9
A	Afuah (2004)	C	4th	Yes	Yes	Yes	No	No	No	Yes
	Hamel (2000)	D	3rd	Yes	Yes	Yes	No	No	No	Yes
B	Rayport and Jaworski (2001)	D	2nd	Yes	Yes	No	–	No	No	Yes
C	Morris <i>et al.</i> (2005)	C	2nd	Yes	No	Yes	No	No	No	No
	Hedman and Kalling (2003)	D	1st	Yes	No	Yes	No	–	No	No
D	Osterwalder (2004)	C	3rd	Yes	No	No	–	No	No	Yes
	Gordijn (2002)	C	2nd	Yes	No	No	–	No	No	No
	Betz (2002)	D	2nd	Yes	No	No	–	No	No	Yes
	Weill and Vitale (2001)	C	2nd	Yes	No	No	–	No	No	Yes
	Alt and Zimmermann (2001)	D	1st	Yes	No	No	–	–	No	Yes
E	Pant and Ravichandran (2001)	D	1st	No	No	No	–	–	No	No
	Mahadevan (2000)	D	1st	No	No	No	–	–	No	No
	Timmers (2000)	D	1st	No	No	No	–	–	No	No

Notes: C, causal; D, descriptive; –, not applicable, *Legend for model and taxa criteria:* 1, mode of inference; 2, level of analysis; 3, generalizability; 4, hierarchy; 5, collective exhaustiveness; 6, parsimony; 7, mutual exclusivity; 8, internally homogeneous; 9, representative naming

Table II.
The summary of the
assessment of the
business models

linking empirical objects to theoretical constructs. The assessed models show significantly differing levels of analysis, ranging from the fourth, component level, to first, system level, as well as to models that specify no level of analysis or are ambiguous in terms of their level of analysis. In addition, most of the models – ten out of 13 – that we assessed are intended to be generalizable by nature. These studies are both context- and time-invariant. However, only five of 13 models exhibit collective exhaustiveness against the definitions of the business model concept and its functions. These models show a level of analysis that ranges from the first to fourth level, and they include both causal and descriptive models. Similarly, only three out of the 13 models have a hierarchical structure explicitly defined in their models. Finally, at the model level, assessment of parsimony is dependent on the assessment of collective exhaustiveness, since only models that are collectively exhaustive can be assessed with parsimony criteria. Of the four models that were collectively exhaustive against our criteria, none fulfills the criteria for parsimony.

Our assessment shows the most prominent directions for future research at the taxa level. Out of the possible ten models comprising more than one level, and thus fulfilling the level of analysis criteria, none fulfills the mutual exclusivity criteria. Similarly, none of the models having hierarchy fulfill the criteria for internal homogeneity. Nevertheless, representational naming conventions are used in most models.

In addition to the fulfillment of criteria in individual models, we also identify several groups of models that form clusters exhibiting similar characteristics. The Cluster A consists of two studies that fail the parsimonious criteria. Hamel (2000) describes the key components of a given business, but not parsimoniously. Its conceptualizations of objects are generally broad without clear definitional discussion of their content. Similarly, Afuah (2004) fails in parsimony, since he includes industry factors as components of business models. Compared to the aforementioned purpose of business

model, this approach further extends the duties of the business model and, therefore, cannot be considered parsimony as it should be.

In the Cluster B, the model of Rayport and Jaworski (2001) differs from the above models in that it is not collectively exhaustive. In addition, it is a context-specific, but the authors suggest that the model could be generalized from their e-business contexts to all businesses.

The Cluster C consists of two models. In the first model, Morris *et al.* (2005) organize their business model around selection from alternative answers to questions concerning the components of the business model. However, in describing the business model as an entity, they fail to provide hierarchy, and their construct operates without relationships between levels and objects. In the second model, Hedman and Kalling (2003) propose a high-level abstraction of the business model concept organized according to value chain. Hierarchically, their model presents some relationships between objects but leaves some unclear. Nevertheless, both the above models are collectively exhaustive and contain the necessary objects.

The Cluster D consists of models six to ten in Table II. These models fail the test of hierarchy – i.e. they do not present explicit structures of a model or its parts. Alt and Zimmermann (2001) has no hierarchy, since it is a system level model. Gordijn (2004) bases his approach on UML class diagrams in which causal relationships between elements can be denoted. However, this modeling approach suggests no relationships *a priori*, though relationships will be depicted *a posteriori* by denoting a particular business model. The contextual limitations were less prominent in the work of Betz (2002), who proposed a strategic business model at a high-level of abstraction. However, this model has no hierarchy, as it leaves hierarchical relationships between components of the business model unspecified. Weill and Vitale (2001) describe a model that has no hierarchy and depict the objects at the same level. Nonetheless, they do explicate some of the relationships between objects. Osterwalder and Pigneur (2004) lack explicit links to strategies at the first level of the model. In addition, they do they present the relationships between elements.

The three models in the Cluster E do not exhibit generalizability, are intimately tied to their specific application domain (that is, e-business), and exhibit only system-level dynamics in their modeling effort. Timmers (2000), Mahadevan (2000), and Pant and Ravichandran (2001) present illustrative classifications of strategies for conducting business with only some elementary considerations. Thus, their assessment is ambiguous based on our criteria.

Conclusions

The business model construct has received increasing attention from academics. The concept has been approached from a number of perspectives and in conclusion, past studies have arrived in conceptualization of various different alternative models. This search for unified definitional grounds has inevitably resulted in confusion, which should not be viewed as a weakness, but rather as an indication that the field has advanced in its scientific inquiry. The field also shows indications of convergence in the basic definitions and functions of its core concepts. Therefore, the field of inquiry has proceeded to a phase in which the business model has become the intermediate unit of analysis in managing technological ventures arising from R&D that has been called for, albeit leaving many questions unresolved. The results of our assessment demonstrate that current conceptualizations fare poorly as a model, especially at the elemental level against taxonomical criteria.

Firstly, at the model level, we illustrate the dominance of descriptive conceptualizations of the business model. The descriptive nature of the models found is natural for a young field. Such conceptualizations are especially useful in highlighting phenomena that require attention. A clear shift towards causal models is needed to ensure that future frameworks can advance our understanding of the interplay between strategy and actions at the operational level. Causal models would also facilitate and further our understanding of strategy implementation issues.

Future research should focus on the more detailed level of analysis to find conceptualizations that go further than merely outlining elements of business models. At present, many concepts only delineate a few critical aspects, without specifying any deeper levels in their analysis. However, the investigation of business models is evolving and shows a promising trend toward greater attention to detail and deeper levels of analysis.

Most of the models in our assessment are generalizable in nature, due primarily to our initial sampling procedure and the strict criteria requiring that the studies selected be targeted towards defining business model concepts at a general level. Despite this limitation, generalizability should be maintained when considering future conceptualizations. Contextual limitations and studies without rigorous considerations for reliability and generalizability increase confusion in the field and do not lead to a unified understanding of the key elements in business models. Furthermore, hierarchical structuring is largely missing from our sample. Hierarchy defining objects and the relationships between objects at different levels would result in more detailed and coherent frameworks for use in research and practice.

In addition to these considerations, our assessment of collective exhaustiveness and parsimony reveals major opportunities for future research. The meager results obtained in our assessment of collective exhaustiveness are consistent with recent criticism over business model literature as being conceptually blurred and ambiguous. Our results are startling, since they give prominence to the need for a field of inquiry to agree upon the conceptual grounds and definitions for the business model concept and its functions. In combination with collective exhaustiveness, parsimony forms an important issue that needs to be explicitly considered in future research.

The weak hierarchical conceptualizations found in this study are also reflected at the level of taxa, where the models show their greatest inadequacy. Scholars in the field should direct efforts to analyzing the basic definitional level of the objects under study when conceptualizing business models. In recent years, the direction of evolution in level of analysis has been toward more detailed conceptualizations at the taxa level. This direction should be maintained in addition to rigorously assessing the validity of the elements. At the taxa level, mutual exclusivity and internal homogeneity are completely absent in our sample. This is especially alarming in the sense that the models developed should inherently embody these criteria. However, our limited binary (yes/no) criteria did not allow partial evaluations and degrees of criteria fulfillment. Future research could aim to rectify this limitation.

Most past studies have been conducted in isolation from the existing body of knowledge, which may have partially contributed to fragmentation in the conceptualizations. The present confusion may have also arisen from the differing vocabulary used in the different studies. We therefore strongly advocate seeking a uniform conceptual ground based on key concepts established in earlier research.

Further, inconsistencies of the business model conceptualizations have direct implications for management in any organizational setting. Organizations capitalizing

on business model concepts on their operations should be aware of the dangers of ambiguity. Poor definitions of business model concepts lead easily to conflicting, incoherent and illogical operations and activities. This might be one of the reasons why a business model as a construct is suffering from adverse reputation; equivocal definitions lead to deficient judgments and decision-making.

Our study illustrates that the current conceptualizations of business models poorly comply with taxonomical criteria, and future research has many opportunities at the elemental level to design relevant conceptualizations for the business model. We hope that this work aids future advancements in building theoretically grounded, unified and measurable conceptualizations in the field.

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