In Need of Change: The Scientific Practice of Representing Business Models
Position Paper

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Abstract: How best to represent business model knowledge is an open research issue. A number of approaches for graphically representing business models have been proposed. These are said to facilitate, for example, the understanding, analysis and innovation of a business model. Nonetheless, through the selective literature review we perform, we find these approaches are largely neglected in case study research on business models. We argue that this practice needs to change to make case study research on business models more consistent and comparable, and thereby strengthen the cumulative character of business model research altogether.

1 INTRODUCTION

A *business model* can be defined as "a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm" (Osterwalder et al., 2005, p. 5). In recent years, interest in the business model concept has surged; the number of academic and journalistic articles has "virtually exploded" (Zott, Amit and Massa, 2011, p. 1023). In this context, Al-Debei and Avison (2010, p. 15) call for research on "the differential influences among approaches of representing the (.) [business model] knowledge (oral, textual, graphical)".

A number of authors argue in favor of using a graphical representation (e.g., Gordijn and Akkermans, 2003; Osterwalder, Pigneur and Tucci, 2005) for reasons that include the facilitated understanding and analysis of business models. A number of approaches for representing business models have been proposed (Kundisch et al., 2012). In addition, in their recent review of the business model literature, Zott et al. (2011) dedicate a separate section to *business model representations* (BMRs) – which is another indication of the importance these approaches have. However, it is not known whether these approaches are actually used in scientific practice. To shed some light on this issue, we perform a selective literature review of case study research on business models.

Our contribution is that we provide first indication for the hypothesis that BMRs are largely neglected by researchers who employ the case study method to study business models. This is regrettable, because BMRs provide a valuable means to consistently and transparently document a business model, and thereby may help to remedy one of the major shortcomings of current business model research: "that researchers frequently adopt idiosyncratic definitions that fit the purposes of their studies but that are difficult to reconcile with each other" (Zott et al., 2011, p. 1021). We argue that this practice needs to change in order to make case study research on business models more consistent and comparable, and thereby strengthen the cumulative character of business model research altogether.

2 BACKGROUND: REPRESENTING BUSINESS MODELS

2.1 Existing Approaches

BMRs have been developed in fields as diverse as

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strategy, e-business, and accounting. Some focus on a specific domain (e.g., e-government), most BMRs, however, intend to be applicable to business models in general. BMRs can be classified according to their *reach*, *perspective*, and *notation principle* (Kundisch et al., 2012): *Reach* illustrates which of the three theoretical layers strategy, business model, and processes a BMR covers. *Perspective* states whether a BMR offers a single view (i.e., one diagram) to represent a business model or whether it offers multiple views (i.e., multiple diagrams), which complement one another. The *notation principle* indicates whether a BMR employs a *network-based approach* to represent a business model or whether it employs a *map-based approach*. The *network-based approach* refers to BMRs that have a fixed number of concepts (e.g., actors, goals; each having a different graphical representation), which are outlined in a network to represent the business model. *Map-based approaches*, in turn, lay out the concepts one by one, thereby providing a template which spatially structures a specific business model's key characteristics. For sample BMRs see table 1.

Table 1: Classification criteria *notation principle* and *perspective*, and respective sample representations.

		Notation principle	
		Map-based	Network-based
Perspective	Single view	Business Model Canvas (Osterwalder et al., 2010)	e3-value (Gordijn and Akkermans, 2003)
	Multiple views	Not available	Strategic Business Model Ontology (Samavi et al., 2009)

2.2 Reasons for Use

Authors advocating the use of BMRs argue that BMRs facilitate the following tasks:

(1) Understand a business model and communicate about it (Eriksson and Penker, 2000; Gordijn and Akkermans, 2003; Osterwalder et al., 2005): A visual representation is seen to facilitate overall comprehension and to be less ambiguous than (informal) natural language, thereby increasing understanding and reducing the potential for misunderstandings.

(2) Analyze and evaluate a business model (Gordijn and Akkermans, 2003): Informally stated value propositions – due to their lack of structure – are inherently difficult to analyze (e.g. regarding their potential profitability), which calls for the more structured basis for analysis that a BMR provides.

(3) Deduce requirements for the underlying information systems (Eriksson and Penker, 2000; Gordijn and Akkermans, 2003): It is easier to deduce requirements from a codified representation than from natural language descriptions, hence, the resulting information systems are better aligned with the business model. Eriksson and Penker (2000) point out that in the case of a business model being used as the starting point for several information systems, the risk that different development teams interpret reality differently (and develop incompatible systems) is reduced by using a BMR.

(4) Innovate a business model (Chesbrough, 2010; Eriksson and Penker, 2000): Building explicit representations of a business model is the basis for experimenting with new variations of that business model and, thus, supports its innovation.

(5) Support business model design through software-based tools (Osterwalder et al., 2005; Samavi, Yu and Topaloglou, 2009): These authors envision practitioners to benefit from software-based tools for business model design, for example, for comparing or simulating business models. These tools in turn need rigorous representations.

3 ANALYSIS: THE SCIENTIFIC PRACTICE OF REPRESENTING BUSINESS MODELS

3.1 Methodology

We approach the question of to what extent BMRs have actually diffused into research practice by means of a selective literature review. BMRs support the work with a concrete business model, and research on concrete business models is usually performed using the case study method. Our approach is to identify case study articles on business models and to analyze the approach for representing the cases that is used in these articles. For identifying relevant contributions, we searched for articles containing in their title *business model* and *case study* (and respective plural forms). The databases we initially employed for our search were Scopus and Web of Science. Search with these databases yielded some 40 results only, therefore, we sought to extend the literature base. We did so using the freely available Google Scholar database. The data provided there are typically of lower

quality than those of commercial databases. Hence, they require substantially more cleaning effort. However, Google Scholar has the advantage of a very broad coverage. It constitutes a reasonable complement to commercial databases in bibliometric studies (Aguillo, 2012), and, consequently, also for the selective literature review that we perform.

We reviewed articles published until December 2011. For Scopus and Web of Science, this restriction allows for reproducibility of the search strategy. For Google Scholar, however, reproducibility cannot be assured, because Google Scholar adds articles continuously and the output cannot be restricted with regards to the articles' time of addition.

We restricted the review to English-language articles and cleaned the initial set of articles from duplicates and erroneous results (e.g., articles whose titles had been crawled incorrectly). For quality reasons, we removed articles that had been published outside journals and conference proceedings.

Due to the broad coverage that especially Google Scholar provides, the problem arose that some publications were not accessible for us. However, we consider this to be a minor problem for the following reasons: First, the respective publications are published in journals that have a very low impact factor or none at all. Second, and more important, there is no indication to assume that omitting these articles introduces a specific bias into our set of publications (for or against use of a BMR) – and only then omitting these articles would be problematic.

3.2 Results

Altogether, our search strategy yielded a set of 57 (accessible) articles, the Venn diagram in figure 1 illustrates their origin. By far the largest number of results was provided by Google Scholar (218 results). The cleaning process reduced this sample to 55 papers. Scopus and Web of Science yielded a substantially smaller number of articles (Scopus: 33, Web of Science: 40). For details, see table 2.

We assigned the articles to one of the following three classes:

(I) Articles that employ a BMR: Articles are assigned to class (I) if they represent a business model using a dedicated graphical representation. Such a representation features notation elements whose semantics are defined within or outside that article with the aim to promote repeated application of the representation.

(II) Articles that employ an ad-hoc notation: If within an article the graphical notation is only introduced for illustration purposes (without substantiating design choices, not seeking repeated application), that article is assigned to class (II).

(III) Articles that do not visualize (parts of) the business model they analyze.

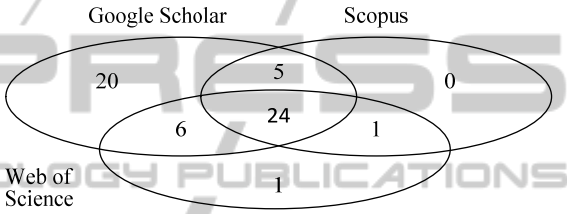

Figure 1: Origin of the final set of articles.

The results of the review are summarized in table 3. Given space considerations, we present the detailed analysis of the reviewed articles in an appendix that is available upon request from the authors. Surprisingly, despite the reasons for using BMRs provided above, more than three quarters of the reviewed articles do not employ a graphical representation at all. They mostly describe the business models in natural language, to some extent making use of tables. Nine out of the 57 articles devise some ad-hoc notation. There are only three articles that employ dedicated approaches for representing business models. The causal loop diagram presented by Casadesus-Masanell and Ricart (2010) is employed in two conference articles (which also share one author). e3-value (Gordijn and Akkermans, 2003) is employed in one journal article. Unfortunately, the respective authors do not justify their choice of representational approach.

Table 2: Results of the search and cleaning process.

Database	Total number of results	Number of results after removing articles that are…					Final set of (unique) articles
		Duplicates	Crawling errors	No conference/journal articles	& Non-English	& Not accessible	
Google Scholar	218	209	192	82	77	55	57
Scopus	33	32	31	-			
Web of Science	40	34	-			32	

Table 3: Summary of classification results.

Final set of (unique) articles	Representation used?		
	Yes	Ad-hoc	No
57	3	9	45

4 DISCUSSION & CONCLUSION

It is an open research issue how business model knowledge is best represented (Al-Debei and Avison, 2010). There are numerous proponents of graphical representations. However, reviewing scientific practice reveals that only a minor share of authors graphically represents the business models they analyze – and only a negligible fraction employs a dedicated approach for this graphical representation.

Given the arguments provided in favor of using a BMR, this seems surprising. However, the arguments such as facilitated innovation or deduction of requirements, in our view, mainly apply to practitioners. Researchers rarely experiment with a business model or develop supporting information systems. Rather, they analyze real-world cases to derive universal, transferable knowledge on how to design a business model. For this purpose, the given arguments mostly do not seem to apply.

Still, there is another set of arguments which better addresses researchers' needs. These arguments concern the mentioned shortcoming of business model research with regards to the application of idiosyncratic, difficult to reconcile definitions (Zott et al., 2011). BMRs could play a vital role in mitigating this shortcoming. Through their predefined sets of notation elements they force a researcher into a predefined frame of reference. The potential advantages include a better comparability of findings, an easier reception of findings by the research community, and a more comprehensive analysis of business models. A prerequisite is, however, that adequate BMRs are available. Therefore, research effort should be devoted to analyzing the hurdles that prevent researchers from using the existing BMRs and, if necessary, refining representational approaches so that they find their way into research practice.

The results of the literature review reinforce our confidence in the chosen methodological approach of performing searches across multiple databases. It turned out that the number of unique articles is highly dependent on the chosen database, varying between 31 (Scopus) and 55 (Google Scholar). The large overlap among the databases (24 out of 57 articles are contained in all three databases) increases the confidence concerning the relevance and comprehensiveness of the considered articles.

Future research could broaden the literature base to receive a more complete picture of BMR use in research practice. The articles that present dedicated approaches such as the Business Model Canvas (Osterwalder et al., 2010) or e3-value (Gordijn and Akkermans, 2003) have several hundreds of citations, and it would be valuable to find out how the citing authors use these works. Following this approach, however, a bias in favor of using a BMR should be acknowledged: the fraction of articles employing a BMR is likely to be higher than in our findings (this had initially been the reason for us for not using a search strategy based on citations – to provide an unbiased view on BMR usage). In addition, complementing our review of scientific practice, a worthwhile endeavor would be to survey practitioners about the awareness and usage of approaches for representing business models.

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