Business Model Grounds and Links:
Towards Enterprise Architecture Perspective

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Abstract

The business model concept emerged in theory and practice without a consensus on the understanding of the concept, but it has become a well accepted and useful construct in fields such as strategy, organization, information systems and technology. This paper aims to provide an overview of the research on the use of business models focusing on outstanding works in this field, extracting main converging findings unburdened of extant lists of specific citations. Following the overview, a comparison of the seven respective conceptual frameworks of the business model research is presented. Finally, after determining grounds, the business model concept is linked to related complex concept – enterprise architecture.

Keywords: business model, value proposition, literature review, enterprise architecture

1. Introduction

In the last twenty years, the business model (BM) concept has been attracting more and more attention from both academy and practice [2]. Although the term itself emerged without appropriate theoretical grounding [3], it has developed into a significant business modelling concept that proved to be able to contribute to advancing a firm's competitiveness [4]. From its beginnings the business model concept aims to depict firm's logic of earning money with a value proposition to customer being the focus of organizing commercial activities (e.g. [5], [3]). Although many authors claim extant heterogeneity concerning the understanding of the business model concept [1], the bottom line is generally common and dealing with the same key issues – organizing business components so as to reach business goals. So what is there actually new and why so much fuss about it? What about other concepts that do 'the same thing' like strategy and like enterprise architecture?

    To answer these questions, first, it has to be stated that to date it is well accepted that the widespread use of the business model came as an answer to the need for

developing business in the rapidly changing environment with the information technologies (primarily Internet) being the main factor of the change (e.g. [6]). Modern organizations and various aspects of their business are becoming more and more complex. In order to manage the complexity of interconnected and multi-layered systems they are being modelled. There are diverse kinds of models depending on their respective purpose, but what they all have in common is that the model has to be applicable and useful. The business model is not one model, but a set of models depicting various aspects of a business: goals, organization structure, business processes, performance key factors, risks, system dynamics, and similar. The presence of different aspects, concepts and formal design methods and techniques depend on the purpose of the business model and purposes are multifaceted as it will be explained in this paper.

The research on the business model concept is still lacking many answers questioning the ways to understand, design, implement and innovate business models. A plethora of definitions, ontologies, research frameworks, taxonomies and other explanations have been provided so far. Some of them, like the Business Model Canvas [7], reached global popularity, some of them managed to set off a more cumulative research on the topic, like for example the Unified Business Model Conceptual Framework by Al-Debei & Avison [8], but still there is no general consensus regarding the concept and the business model research structure is blurred [9] originating from diverse disciplines such as e-business, strategy, business management, economics, information systems and technology [10], [11].
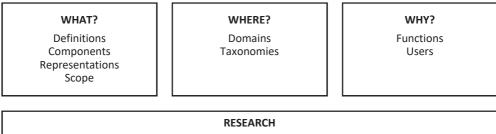
Enterprise architecture is a concept that similarly to business model aims to describe a business system but is more complex because of a greater scope. The scope is though disputable since enterprise architecture too does not entail a common definition and understanding of the concept is still developing. Generally, enterprise architecture is a set of representations or models that describe entire enterprise on all levels in order to align business goals, processes, resources, etc. But in the literature there are several approaches identified, e.g. enterprise architecture is seen as a description, a structure, a set of principles or a management approach [12]. It can be employed for various purposes but most often it is dedicated to business IT alignment. The accent on the IT infrastructure often neglects the strategy demands [13] and places enterprise architecutre research mostly within the boundaries of information systems. Some authors have recognized a potential of a business model concept to facilitate linking of the strategy and enterprise architecture. But still, „enterprise architecture as a fundamental exercise to achieve a structured description of the enterprise and its relationships appears far from being adopted in the strategic management arena" [14, p.5].

The objective of this article is to present a concise overview of the business model concept development and to address the state of the art in order to determine the ground for the future research that should shed light on the association between business model and related concepts, strategy and enterprise architecture. This is needed for advancing the use and implementation of all three concepts. It is identified that "business strategy and, particularly, the business model find themselves underrepresented in the EA literature" [14, p.9].

According to Creswell [15] there is no single way to conduct a literature review but it should be done in a systematic fashion. In interdisciplinary fields, such as this one, conceptual structuring is encouraged [16]. An exhaustive systematic literature review (SLR) on the business model concept is beyond the scope of this article. The literature review is structured according to the following research questions (Figure 1):

- *What is a business model 'physically'?* Meaning, in what form does it appear in theories and practice. This will be delineated by the selected definitions, components, representations and scope of the business model concept.
- *Where is a business model used?* The field of the business model use will be presented by identifying particular application domains and taxonomies.
- *Why is a business model used?* The business model concept has a potential of having many functions and users which are partially addressed through research.
- *How is the research doing?* Different theoretical research frameworks will be compared in order to evaluate their impact on the research efforts and vice versa.

This structure is in line with the overview of enterprise architecture literature in [17] which is done along similar criteria (the understanding of enterprise architecture; the representation of enterprise architecture; the use of enterprise architecture) in order to set comparable grounds for the future research.

WHAT?	WHERE?	WHY?
Definitions Components Representations Scope	Domains Taxonomies	Functions Users

RESEARCH
Structure & Progress

Figure 1. Research questions and framework for literature review

For the purpose of the literature review, authors rely on several well regarded publications that provide thorough overview of this literature by segment and in whole and on the identified outstanding works on specific issues. The relevance of works has been verified by the number of citations in the Google Scholar and the Web of Science. All the reviewed articles are listed in the References section in order of appearance.

Elements of the first three research questions constitute the framework for the systematic review of the business model research. The last review question has two objectives. Firstly, here applied research framework will be confronted with other research frameworks throughout the history of the literature and evaluated.

Secondly, the comparison of the selected well regarded frameworks will examine the path(s) of the research progression from a bird's eye view. Here we have extended our former analysis [1] with the most recent source of business model conceptual research frameworks [6]. The assessed state of the art in the business models field should make a ground for the following association between three concepts (strategy, business model and enterprise architecture). The paper is structured following research questions in the aforementioned order.

2.   Business Model Concept

2.1.   Business Model Definitions

Many authors have provided their own definition of the business model resulting in an abundance of statements and contributing to the fuzzy perception of the term. This has caused a long and exhausting duration of the constitution phase of the concept. Table 1 presents selected commonly cited definitions chronologically.

Author(s), year, [reference], page: Definition
Timmers, 1998, [18], p.2: The business model is "an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues".
Amit and Zott, 2001, [19], p.493: The business model depicts "the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities".
Chesbrough and Rosenbloom, 2002, [20], p.529: The business model is "the heuristic logic that connects technical potential with the realization of economic value".
Magretta, 2002, [5], p.4: Business models are "stories that explain how enterprises work. A good business model answers Peter Drucker's age old questions: Who is the customer? And what does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?"
Osterwalder et al., 2005, [21], p.17: "A business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams."
Teece, 2010, [3], p.179: "A business model articulates the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value."

Table 1. Selected business model definitions

Even nowadays there is no generally accepted definition, so after two decades of lively research, scholars still toughly debate on what a business model "is" having

focused discussions at many large conferences, report Massa et al. [6]. But the understanding of the concept has been converging by enveloping partial views. One of the most relevant analysis of the 22 definitions can be found in Al-Debei & Avison [8] that results with the well regarded conceptual framework (see Section 3). A recent detailed historical analysis of the business model definition development is brought by Wirtz et al. [4] ending with yet another definition which adds increasingly discussed dynamic view to the concept. Based on several extensive literature reviews, Foss and Saebi [22] notice the definitional convergence around Teece's notion of the business model concept. But the latest conceptual analysis of the business model definitions presented in [6] propose that there are generally three distinctive business model perspectives, called "interpretations", which determine the construct itself – namely, (1) "business models as attributes of real firms", (2) "business models as cognitive/linguistic schemas", and (3) "business models as formal conceptual representations of how a business functions".

It can be seen that authors have been "desperately seeking definition" [11] which may be frustrating but at the same time inevitable concerning the multidimensional and interdisciplinary nature of the concept. It is interesting though that a lack of generally accepted definition makes such a mess in the business model research while the same lack of a precise definition of strategy for sixty years now has not stopped a progress in that field [23]. Answers to the issue of identifying the business model construct should be further sought in the next step of explicitation which is defining business model components that is presented in the next section.

2.2. Business Model Components

Following business model definitions, the next level of business model conceptualization, is the decomposition into its components, often called "the building blocks". This level of explicitation is of great value for clarifying, comparing and unifying different perspectives which many authors attempted. When defining business model components, authors again demonstrate heterogeneity, which is mostly determined by the different perspectives and different levels of abstraction so "the business model literature has not yet reached a common opinion as to which components exactly make up a business model" [24, p.1]. Selected synthesis based on the criteria of converging views will be presented in short.

Osterwalder [25] evaluated his business model ontology proposition by relating proposed business model building blocks with components found with other authors. His work became one of the most famous and widespread in both theory and practice depicting the business model with nine building blocks belonging to four main pillars (areas): product (value proposition), customer interface, infrastructure management and financial aspects (Figure 2).

Shafer et al. [11] analysed 42 different components across 12 definitions of the business model by means of the affinity diagram. The results showed four major categories: strategic choices, creating value, capturing value, and the value network resembling Osterwalder's proposition.

Al-Debei and Avison [8] after employing content analysis on 22 business model definitions deduced a conceptual business model framework including an ontological structure of the concept having also four dimensions (V4 business model dimensions): value proposition, value architecture, value finance and value network.
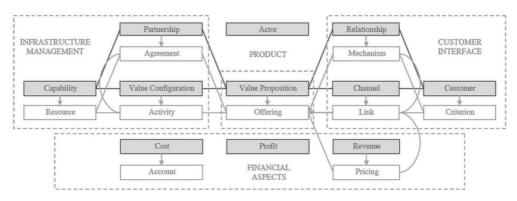

Figure 2. Business model ontology [25]

Wirtz at al.'s [4] analysis of the literature on business model components indicate that the heterogeneity of the approaches comes from the difference in the degree of abstraction. While the majority of the examined authors focus only on certain aspects, only 30% take a broad view which takes into consideration the whole spectrum of the components. They find that resources and market offering (value proposition) are the most utilized components and divide the overall spectrum into three general groups of components: strategic, customer & market and value creation components.

Figure 3. Business model higher level components

Selected sources have two important characteristics. First, all of them propose a decomposition at a similar level of abstraction which is important for comparing the components. These four sources demonstrate congruent thinking concerning business model decomposition into elements at a higher level of abstraction. In most of the cases there are four elements that are very similar although named somewhat differently. Figure 3 depicts the comparison between the four propositions by mapping overlapping of each component against Osterwalder's main components on the left. Mapping is done by looking at the sub elements of each element which are available in the original papers that are listed in References section. The second important characteristic of the selected four sources is that the authors came up with their proposition by drawing on the literature analysis of the many sources of business model components. This is obviously more valuable insight than to make just another proposition on their own. These are attempts of generalization and making common grounds for understanding the business model concept in whole.

Presented components at this higher level of abstraction (but not the highest) show congruent thinking in the business model constituent parts. They all embody important strategic aspects from the value proposition (i.e. product in a broader sense) to making profits with resources, processes, markets, partners, etc. in between and around. The many different names and structures of components are adding to the fuzziness of the concept and produce a lot of a discussion on it, but it does not stop authors to propose new solutions again and again, even without a single thought to relate to someone else's previous work. This present state can be seen as the situation in which authors have open choice to choose and recombine among many different options as long as they stay within implicit business model boundaries. It is important to notice that a typical application area of business model decomposition into components in such 'open' way is the area of innovation studies [26] because it helps to ideate and decide on what to innovate. Massa and Tucci [26] also stress the importance of the level of decomposition regarding the structure of business model (innovation) ranging from, the highest, a narrative (e.g. "Business models are stories.." in [5]) which is difficult to manipulate to, the lowest, activity system (e.g. [27]) which is detailed and accurate, but complicated.

2.3. Business Model Representations

After definitions and components, the next step in identifying the business model concept is a business model representation (BMR) - an explicit representation of the reference model and its instances. When talking about the BMR issue, sometimes authors refer to the business model design and sometimes to the business model ontology (BMO). Although these three terms does not mean exactly the same thing, their content overlapping comprises the focus of the problem under question.

As many business model definitions state, business model is concerned with representing certain business logic. Osterwalder [25], whose Business Model Ontology/Business Model Canvas [7] became the most popular tool for BMR to date, even calls it a "blueprint of the company's logic of earning money". So it is of utmost importance to have a rigorous method of achieving this. But following

heterogeneity with definitions and components, a standardized way of designing and representing business models has not yet been established and is still one of the most important open questions regarding the business model research [4]. Authors have employed a mixture of informal textual, verbal and graphical representations [2]. Imagine an architectural plan of hundreds million dollar worth building sketched on the paper in an informal and ad hoc manner. Would you consider it? Maybe, but probably not.

One of the rare literature reviews focusing on BMR methods has been done by Kundisch et al. [28] resulting with the classification framework of 13 selected approaches. Due to the space constraint of this paper, table 2 presents a synthesis of the framework showing only classification criteria and the total number of respective BMRs. Since these approaches have been rarely gathered throughout the literature, a complete list of works is provided here: Activity system map [29], Business models for e-government [30], Business model ontology [25], Causal loop diagram [31], e3-value [32], E-business model schematics [33], Eriksson-Penker business extensions [34], Integrated business model concept [35], Resource-event-agent [36], [37], Strategic business model ontology [38], Value map [39], [40], Value net [41], and Value stream map [42]. These approaches differ not only in notational elements they use but also in the level of sophistication when describing them thereby often leaving the semantics implicit. This poses difficulties in cumulative research and authors rarely build on each other.

Criteria	Sub-criteria	Total No. of BMR
Reach	Strategy layer	8
	Business model layer	13
	Process layer	1
Perspective	Single view	10
	Multiple views	3
Notation principle	Map-based	2
	Network-based	11
Tool support	Formalization	6
	Design	6
	Financial evaluation	1

Table 2. BMR classification framework
(adapted from [28])

Six out of the previous thirteen approaches were recently selected as well-established and were evaluated as business model ontologies (BMO) for securing viability [43]. They were compared against 26 criteria but none of the BMOs satisfied all of them, while e3-value [32] supported most of them. It is striking that none of the approaches supports the criteria "represent the business architecture". There are some other important viability criteria that are also fully ignored and

should be worked upon in the future. The problem is to find a way to model complex and dynamic settings without overcomplicating the design. One of the reasons why Osterwalder's BMO [25] became so popular and successful is the ease of use and understanding so many recent works build upon him.

Another analysis of existing BMOs by Burkhart et al. [44] should also be considered which identifies a few yet unmentioned works and results with the proposition of a new and improved one synthesised and extended.

It is important that these authors suggest that the future development of the ontologies should follow existing approaches of enterprise metamodeling since, finally, business models should be implemented in existing surroundings.

2.4. Business Model Scope

The discussion on the business model scope could seem redundant after investigating definitions, components and representations which should have already explained the scope too, but they have not. So many authors attempt to add to the understanding of the business model concept by discussing its scope separately, in advance or afterwards. The scope should illustrate the reach of the business model concept covering the company and its surroundings. When defining the boundaries of the business model scope, the discussion usually involves several other concepts such as strategy, business processes (BP), information system (IS) and enterprise architecture (EA). These four aspects will be discussed in short in the next paragraphs.

The debate on the relationship between the business model and the strategy has often been tackled throughout the history of the business model research. Seddon et al. [45] focused on this issue and illustrated possible overlapping of the two concepts in five generic ways (Figure 4) according to the discussion found in the literature.
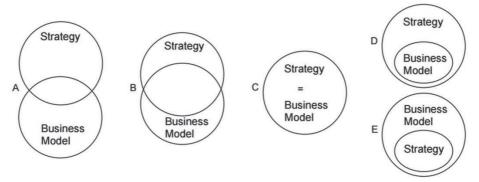

Figure 4. Business model and strategy [45]

Different relationships are a logical consequence of the different understanding of the business model concept. The debate continues until today as we can see that scholars still disagree "whether the term [business model] stands alone or is simply synonymous with strategy" [6, p.73].

A few recent works have demonstrated important main traces of this disagreement. In Markides [23], following [46] and [47], two different views on the business model concept are seen as the origins of the overlapping issue.

In the first view, the business model concept is a description of how the firm operates, and as such is being almost synonymous with strategy. In the second view, it is a model of creating value that transcends industries and as such has prospects for theory development. Massa et al. [6] also analyse the two positions of the debate: business models as strategy in "new bottles" on one side and business models as a separate field on the other. The two positions they identify stem from the differences between traditional and non traditional views of value creation. Non traditional views question the traditional theories of value capture and value creation, moving the focus on the demand side of the value system which leads to new models, apparently called business models, since traditional theory in strategy does not support that. These recent works witness a profound and unifying aspect of the business model *raison d'être* which has a power to explain the emergence, the rapid adoption and the various use of the business model concept – and it is the changing logic of value creation.

To date the views have converged around the B option having a large intersection area of two different concepts. While a business model can be a source of a competitive advantage, it is distinct from the strategy being its extension and complement [2]. In this vein, many authors see business model as an execution of the strategy. Following this approach, business model can be presented as an interface between the strategy and the business processes (Figure 5) filling the gap that emerged between those two in the present dynamic and competitive environment [8]. The intersections are the issues currently under research with the aim to explain the transition processes to be followed.

Positioning the business model concept between the strategy and business processes further leads to relating it to the information system and the enterprise architecture. This is especially important when dealing with technological innovations that are nowadays more and more frequent in business.

Iacob et al. [48] present a method for migrating enterprise architecture from present to a target one driven by the business model in order to monitor the business value of the change. The proposed method employs the ArchiMate, the EA modelling standard, and the Business Model Canvas, the most popular business model design tool. Bonakdar et al. [49] investigate the influence of business processes on business models and exploit the usage of performance measurement systems to manage business model changes. Solaimani and Bowman [50] propose the VIP framework for aligning business model and business processes independent of a specific modelling tool. Caetano et al. [51] integrate e3-value, Business Model Canvas and ArchiMate into a modelling landscape in order to addresses different organizational concerns such as strategy, processes and information system.
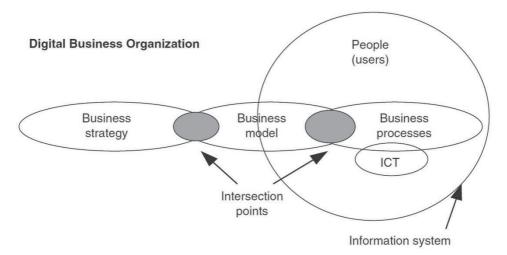
Figure 5. Business model in an organization [8]

It is evident that the research on business model scope has gone further to explain the business model role in linking the strategy and the enterprise system thereby opening a whole new research field [52].

2.5. Business Model Taxonomies

Many authors attempted to provide typologies and taxonomies of business models to facilitate creation and development of a proven successful business model for the company. The aim is to make the concept of business model as practical as possible providing an instant solution to the managers seeking a new way to do business. Baden-Fuller and Morgan [47] elaborate on the idea that "the notion of business models enables us to classify businesses" (p.157) by acting as a scale model or a role model to develop ideal types. A plethora of attempts to provide a taxonomy or a typology can be found in the literature (e.g. [53], [54]). Gassman et al. [55] go a step further and develop a method, the Business Model Navigator, for business model innovation design that consists of 55 business model patterns which are identified through an extensive empirical research of business model innovations over the past fifty years.

2.6. Business Model Domains

Although the business model concept emerged with the 'dot com' boom and companies focusing on e-commerce, the general applicability of the business model across diverse industries has been proved in theory [56] and practice. According to the IBM survey [57], which was based on interviews with 765 corporate and public sector managing directors worldwide, financial outperformers put double emphasis on business model innovation compared to underperformers showing the importance of this concept in practice.

In the review of empirical research on business models spanning from 1996 to 2010, Lambert and Davidson [53] argue that both managers and researchers find business model as a useful construct. The result of their analysis show that the dominant industry domain of the business model application is, expectedly, information, media and communications (44%), but all other industries have also been represented with the substantial share (Figure 6).
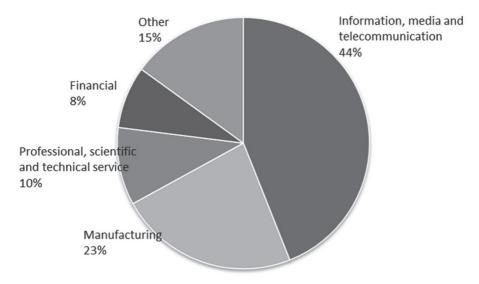

Figure 6. Business model in industry sectors
(adapted from [53])

Recent research also shows continuing diversity of application domains. Pekuri et al. [58] investigate the role of the business model in the construction business. Schief [59] focused his dissertation on business models in the software industry. Zolnowsky [60], in his doctoral thesis, investigates the design of the service business models with empirical research conducted in five manufacturing firms from the mechanical engineering and automotive industries. In Bonakdar's [54] dissertation, author explores how firms create and capture value with business model innovation. The empirical research is   conducted on two case samples (25 and 29 firms respectively) originating from various types of business (fast food, elderly care, fashion, restaurant, grocery, association, personal care industry, printing devices, coffee capsules, electronics, music, car sharing, online marketing, healthcare, telco, hotel, gaming, newspaper, credit card, online payments and other).

2.7.   Business Model Functions

Many scholars have posed the question why is a business model a useful concept (e.g. [61], [62]). There is a vast number of ways to answer this question that should be followed by an extant discussion which is beyond the scope of this paper. Therefore only a brief overview of possible business model functions adapted from

Osterwalder [25] will be presented. Osterwalder's work has been chosen because his business model ontology is the foundation for the most widely used business model design tool Business Model Canvas proving his assumptions on business model functions.

Five categories of business model functions can be identified: understanding and sharing, analysing, managing, prospecting and patenting.

Business models help in *understanding and sharing* the business logic of a firm by capturing ideas in the heads of the stakeholders, visualizing complex information, helping clarify elements and relationships and communicating it in a more tangible way.

Business models' role in *analysing* the business logic is in improving the performance measuring system, observing changes in a structured way, enabling comparison with competitors and benchmarking.

Business models contribute to the *management* of the business logic in several ways. They provide the tool for easier design of a sustainable business model. They facilitate the changes to new business models through plan, change & implement process. They enable quicker reaction to changes in environment by modifying only certain elements of the model. Business models, as discussed earlier in the Scope section, are the link between strategy and the business system and can serve as an alignment tool. By doing all of this, business models also improve decision-making because the business is better understood, measured and analysed.

Concerning a *prospecting* function, business models can foster innovation giving a business model designer a toolbox to play with and invent new configurations. The designer can even stock several potential business models for the future in order to cope with unexpected change. It is possible to simulate and experiment to prepare different scenarios for the future.

Companies in e-business seek ways to *patent* their processes. Additionally, business model could possibly serve as a medium in this legal domain.

All business model functions can be wrapped up in one great thought: "Business modelling is the managerial equivalent of the scientific method – you start with a hypothesis, which you then test in action and revise when necessary." [5, p.5].

2.8. Business model users

To further elaborate on the business model concept usefulness theoretically and practically, it is important to address business model users as stakeholders of the future research. Since the business model is used for multiple purposes described in the previous section, it has various users. Three respective user groups can be identified [63]: managers/decision makers, IS developers and external users.

Primarily, *managers and decision makers* benefit from using the business model concept to better understand and share the business logic of the firm, to manage it and prepare for the future.

Secondly, *IS developers* can use the business model concept as a facilitator of requirements engineering, linking and aligning the business goals with the underlying IS and IT infrastructure. Gordijn and Akkermans [32] explain that for IS

development representation techniques from the process and information viewpoints are available, while missing from the value viewpoint and the business model concept should be able to depict that.

And thirdly, *external users* can find the business model concept helpful in understanding the business concept of the entity of interest. These users are: business consultants, analysts, legal professionals, investors and researchers.
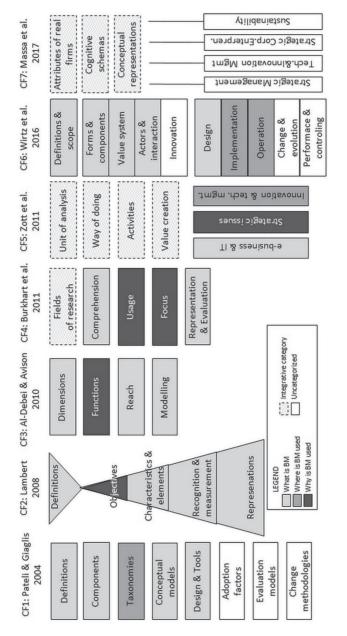
Different users can have different needs reflecting mostly on the level of abstraction of the business model representation.
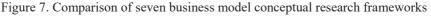
3.   Business Model Research Frameworks

Statements such as "lack of consensus regarding business models", "a research diversity", "the absence of a common underlying theoretical basis", "fuzzy and vague concept", "cumulative progress is hampered", "the literature is dispersed", "heterogeneous understanding", "blurriness of the research structure" etc., repeat over and over again for twenty years now across the literature on business models. Several authors attempted to propose a research framework in order to provide the unified basis for more structured theory development but a generally accepted framework does not exist. Therefore, as part of the research presented in this paper, seven selected conceptual frameworks (CF) will be analysed to depict 'how the research is doing', i.e. what overall progress has been done from a bird's eye view (Figure 7). The three shades of grey filling the boxes in different frameworks show the correspondence to the research framework applied in this review (the *What? Where?* and *Why?* research questions). Boxes with dotted outline represent integrative areas where single category could not be identified but are a mix of two or more. White coloured boxes are uncategorized areas pointing to either emerging new categories (e.g. innovation and change issues) either to very specific issues that are not answering any of the three questions of our research framework directly.

CF1 is one of the first and most famous research frameworks and was proposed by Pateli and Giaglis [10]. They classify the business model research into eight sub-domains which will be used as a starting point for comparing with other frameworks. These sub-domains build on each other from the constitutional basics (Definitions) through structural explanations (Components, Taxonomies, Conceptual models) towards more complex managing issues of the maturing concept (Design & Tools, etc.).

CF2, brought by Lambert [63], is another incremental and logical framework which is based on the long-standing financial reporting research framework. Although it does not build on the previous business model framework, CF2 is consistent with CF1, at least up to the level of the design issue. It does not go further as its aim is to enable the consensus abut the key terms and concepts as a solid ground for debating further issues. The shape of a pyramid stresses the importance of the direction and hierarchy of research steps.

Figure 7. Comparison of seven business model conceptual research frameworks

CF3, developed by Al-Debei and Avison [8] is here concisely represented by its four upper classes that encapsulate 13 atomic classes altogether. This framework was generated directly from business model definitions and has not intended to build upon the previous frameworks. Similar to CF2, CF3 ends up consistent with CF1 sequentially following levels up to the design. It is interesting to note that for the first time it leaves out the first phase of defining the concept.

CF4 build by Burkhart et al. [56] is the first one to upon the previously proposed framework, that is CF1. The 'building' is done through the category Fields of research consisting of attributes following CF1 sub-domains where authors quantitatively analysed the progress made in particular fields. The other four categories (Comprehension, Usage, Focus and Representation & Evaluation) are added to refine the analysis in a qualitative manner, also in concordance with Pateli and Giagli's research agenda suggestion for integrating atomic elements of their proposed framework.

CF5 by Zott et al. [2] takes a whole different multidisciplinary and subject-matter approach. Authors propose a two-dimensional framework with three phenomena being addressed on one side and four main common themes on the other. Their work does not build on any other previous framework and is most difficult to map it against others because it combines the previous atomic categories in a novel and overlapping way.

A very recent CF6 by Wirtz et al. [4] presents again more atomic view with some new categories emerging, but also covering most of the old ones, and again including definitions. Authors' literature review reveals that the most of the research work is allocated to Innovation (26%), Change & evolution (18%), Performance & controlling (16%) and Design (16%).

And finally, CF7 by Massa et al. [6] brings a whole different view on the vast business model literature focusing "only" on the construct validity problem and its interpretations structuring the whole research field into three basic categories depending on the understanding of the word "model". This radical approach adds much more clarity to the problem of the unstructured business model research by structuring its roots instead of dealing with a myriad of specific issues. After laying the ground for the business model construct understanding, authors examine the four fields as research directions for the business model future.

These links to other fields support our aim to associate the business model concept to other organization managing concepts such as strategy and enterprise architecture.

4.   Towards Enterprise Architecture Perspective

The aim of this section is to shed light on the relatively neglected issue of linking business models with related modelling concepts in the area of business information systems as an area rich with modelling theory and practice and an area that needs an implementation link with the requirements from a business model and a strategy.

When considering the business model research field, this issue seems to spill outside of the field boundaries and in general business model literature reviews is hardly found. In the latest extant systematic general literature review [4] this specific issue is difficult to locate (see CF6 in Figure 7). We should assume that the work on the 'linking issue' should be found in the *Implementation* area but the authors of the indicated review have not provided the full list of reviewed articles so we could not confirm the assumption. Nevertheless, it is interesting to note that that *Implementation* area comprises quantitatively only 3% (19 out of total 681) of all the

reviewed business model articles and is "seldom or superficially, but never comprehensively considered" [4, p.48.].

But, the issue of linking and aligning business models, or antecedent strategy models, with information system related models can be found in works belonging to research on information systems, information technologies, enterprise architecture, and similar (e.g. [64], [65], [66], [48], [51], [67]). Authors demonstrate mapping of the business model components onto enterprise architecture components and vice versa if possible. One of the first propositions of relating a business model and enterprise architecture done by Fritscher and Pigneur [64] is presented here (Figure 8) to depict the idea of corresponding elements between the interrelated models.
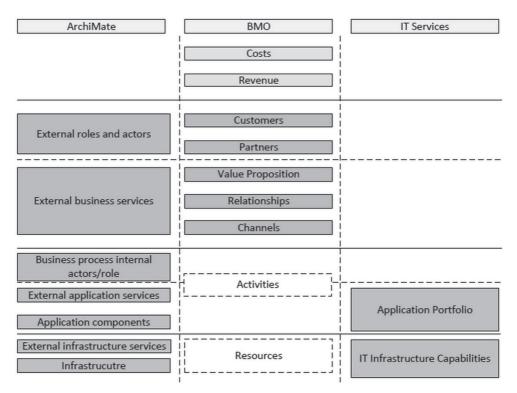

Figure 8. Example of correspondence
between business model and enterprise architecture elements [64]

This and other attempts of connecting business and IT models are driven by the need to close the gap between business and IT. There are difficulties from both 'sides'. On one side, a business starts from a strategy that has to be implemented. The process of implementation is complex and it comprises the IT solution. On the other side, starting from the frequent technology changes, there are IT innovation projects which should be in concordance with the overall business logic, but often they are not. "Many IT projects fail to succeed in the market, as they start purely from technology" [48]. It is evident, from these and many other sources that a holistic understanding of the structures and underlying logics of both the business

and IT are needed for successful presence on the market. The concept of the business model has a potential to overarch these difficulties.

Before analysing business model potentials to assist in the implementation of a strategy in an IT enabled organization, it is important to introduce and/or ground the understanding of the basic concepts involved - *strategy*, *business model* and *enterprise architecture*. The discussion on the unresolved difference between a strategy and a business model is briefly presented in Section 2.4. In short, the overlapping of the two concepts is not clear so we must first declare our stance towards their scopes. For the time being, while the related fields are still developing having a potential to converge which would change the overall picture considerably, it is valuable to see business models as extensions of a strategy, more granular and opening newfound possibilities for innovation regarding the value creating process which are not available in the traditional strategy theories. A strategy can be implemented through more than one business model.

Enterprise architecture, just like a strategy and a business model, does not have a single common definition and similar to the business model concept there is "a plethora of terminology and lack of shared meaning in this domain" [68]. When starting to explain this complex construct, authors usually (e.g. [69]) start with a definition of an architecture by ANSI/IEEE as a "fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution" [70]. Following that, enterprise architecture is about enterprise's components and their alignment through use of models. "The purpose of enterprise architecture is to create a map of IT assets and business processes and a set of governance principles that drive the ongoing discussion about business strategy and how it can be expressed through IT" [71].

A latest literature review on enterprise architecture [12] identifies four approaches to define the concept, as: (1) inherent enterprise structure, (2) blueprint of an enterprise in its various facets, (3) set of principles prescribing architecture design, and (4) methodology or process guiding the design of enterprise architecture. Concerning enterprise architecture's scope there are three major categories identified: (1) the simplest is limited to IT components, (2) extended covers IT and business components, and (3) further extended incorporates elements that realize business capabilities and strategic business elements. The latest and the most extended scope is actually present since the first concept of enterprise architecture by Zachman [72]. But, although this concept has the greatest potential to model and manage systematically and holistically complex business system, "the scenario of managing the corporate strategy does not appear to be given much consideration in the literature and in practice, despite that the original idea of EA involves elements such as business goals, strategies, plans, products, and partners" [14]. So the question of finding a strategy in an enterprise architecture, and, inversely, finding an enterprise architecture following a strategy is open and called upon. The dominant IT-centric view of enterprise architecture management application is challenged with an approach that enterprise architecture management could support the consistent design and evolution of an organization as a whole [12].

To explore this possibility, we need to compare models of the two concepts. In sections 2.2. and 2.3. the business model components and representations are discussed showing heterogeneity of approaches. There are many enterprise architecture frameworks in use too. A partial list of 17 namely can be found in [71] among which the most commonly used are the Zachman Framework [72] and TOGAF [73]. E.g., in more than 40 percent of the enterprise architecture publications analyzed in [13] refer to TOGAF or Zachman. John Zachman with his framework is considered an originator of the enterprise architecture concept and was "used most frequently for business and information systems" [74, p.131]. "It is the one referenced most often up to 2004, after which (…) "The Open Group Architecture Framework" (TOGAF) has become the most prominent approach in practice" [13, p.4].

Since our purpose here is to link the theoretical grounds of the business model and enterprise architecture, the "grounding" models are chosen for the association – the Business Model Canvas (Figure 9) and the Zachman Framework (Figure10). They both provide holistic, but at the same time clearly structured overview of the main underlying ideas.
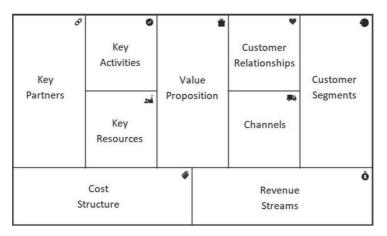

Figure 9. Business Model Canvas [7]

The Business Model Canvas comprises nine building blocks, namely (from left to right): (1) Key Partners (out of enterprise entities providing outsourced activities and other resources), (2) Key Activities (activities performed to offer and deliver value proposition), (3) Key Resources (assets required to offer and deliver the value proposition, (4) Value Proposition (a set of offerings that seek to solve customer problems and satisfy customer needs), (5) Customer Relationships (types of relationships established with specific customer segment), (6) Channels (ways to communicate and reach customer segments), (7) Customer Segments (the different groups of people or organizations enterprise aims to serve), (8) Cost Structure (costs incurred to operate a business model), (9) Revenue Streams (cash generated from each customer segment) [7].

	DATA (What)	FUNCTION (How)	NETWORK (Where)	PEOPLE (Who)	TIME (When)	MOTIVATION (Why)
OBJECTIVES/SCOPE (CONTEXTUAL) — Planner	List of Things Important to the Business. Entity = Class of Business Thing	List of Processes the Business Performs. Function = Class of Business Process	List of Locations in Which the Business Operates. Node = Major Business Location	List of Organizations Important to the Business. People = Class of Agent	List of Events Significant to the Business. Time = Major Business Event	List of Business Goals/Strat. Ends/Means = Major Bus. Goal/Critical Success Factor
ENTERPRISE MODEL (CONCEPTUAL) — Owner	e.g. Semantic Model. Ent. = Business Entity, Reln. = Business Relationship	e.g. Business Process Model. Proc. = Business Process, I/O = Business Resources	e.g. Business Logistics System. Node = Business Location, Link = Business Linkage	e.g. Work Flow Model. People = Organization Unit, Work = Work Product	e.g. Master Schedule. Time = Business Event, Cycle = Business Cycle	e.g. Business Plan. End = Business Objective, Means = Business Strategy
SYSTEM MODEL (LOGICAL) — Designer	e.g. Logical Data Model. Ent. = Data Entity, Reln. = Data Relationship	e.g. Application Architecture. Proc. = Application Function, I/O = User Views	e.g. Distributed System Architecture. Node = I/S Function (Processor, Storage, etc.), Link = Line Characteristics	e.g. Human Interface Architecture. People = Role, Work = Deliverable	e.g. Processing Structure. Time = System Event, Cycle = Processing Cycle	e.g. Business Rule Model. End = Structural Assertion, Means = Action Assertion
TECHNOLOGY MODEL (PHYSICAL) — Builder	e.g. Physical Data Model. Ent. = Table/Segment, etc., Reln. = Key/Pointer, etc.	e.g. System Design. Proc. = Computer Function, I/O = Data Elements/Sets	e.g. Technology Architecture. Node = Hardware/System Software, Link = Line Specifications	e.g. Presentation Architecture. People = User, Work = Screen Format	e.g. Control Structure. Time = Execute, Cycle = Component Cycle	e.g. Rule Design. End = Condition, Means = Action
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT) — Sub-Contractor	e.g. Data Definition. Ent. = Field, Reln. = Address	e.g. Program. Proc. = Language Stmt, I/O = Control Block	e.g. Network Architecture. Node = Addresses, Link = Protocols	e.g. Security Architecture. People = Identity, Work = Job	e.g. Timing Definition. Time = Interrupt, Cycle = Machine Cycle	e.g. Rule Specification. End = Sub-condition, Means = Step
FUNCTIONING ENTERPRISE	e.g. DATA	e.g. FUNCTION	e.g. NETWORK	e.g. ORGANIZATION	e.g. SCHEDULE	e.g. STRATEGY

Figure 10. Zachman Framework [75]

Zachman Framework is a two-dimensional set of representations split into six perspectives (Planner, Owner, Designer, Builder, Sub-Contractor, Functioning System) and six characteristics (What, How, Where, Who, When, Why). Every element in the matrix can have its own model and representation so this is "the generic logic structure that organizes, or classifies, the descriptive representations of complex objects. (…) Each component has an architecture in its own right, but must fit within the architecture of the whole object (…)" [75, p.5-6].

There is more than one way to associate the Business Model Canvas and Zachman Framework (Figure 11).
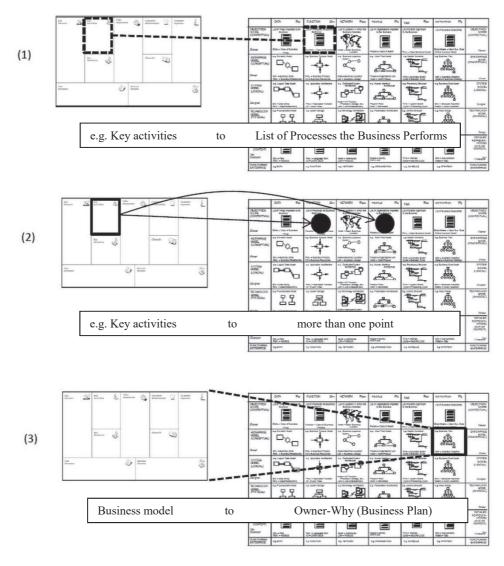

Figure 11. Associating business model and enterprise architecture

First, the components could be mapped to find semantical overlapping and/or corresponding between them. This is promising in the sense that there are definitely element that appear in both concepts. For example, "List of Processes the Business Performs" in Zachman Framework (Planner How element) corresponds to the Key Activities element in the Business Model Canvas. But not all the components are such easily understood because in the business model concept the abstraction is placed on a high level and it represents only main leading ideas that have to be developed in the next step of designing the system.

Second way is to define the points it the enterprise architecture framework that can be derived from the elements in the business model concept. This is more promising, since it does not demand identical contents of the elements.

Third way is to place the entire business model as one of the autonomous components of the Enterprise architecture (e.g. at the place of the Owner Why element).

There may also be other ways that would include extensions of the present models/frameworks.

The proposed approaches to associating business model concept and enterprise architecture are rooted in the "grounding" and well-accepted respective models and their logics. It is beyond the scope of this article to propose the method to guide the three possible paths. For such an investigation a complementing empirical research would be strongly recommended.

5. Conclusion and Implications

This paper aimed to provide an overview of the research on the use of the business model concept focusing on the outstanding works in this field, extracting main converging findings unburdened of extant lists of specific citations. Following the overview, a comparison of the seven respective conceptual frameworks of the business model research was presented. Finally, after determining grounds, the business model concept was linked to a related complex concept – enterprise architecture.

In the comparison of business model research frameworks, it is evident that authors rarely build on each other but still manage to demonstrate relatively congruent thinking. For the purpose of a systematic literature review it is necessary to set up a conceptual framework for classification what the authors have done, but the other aim of the authors to facilitate cumulative research has not been demonstrated. The overall research on business model is growing in numbers steeply, and academics are still addressing various proposed atomic attributes of the concept individually, in differently integrating constellations or with different understanding of the concept.

In answering the question 'how the research on business model is doing', it can be stated that the structure of the research is still vague and only very broad common categories can be identified. This paper started with the classification based on three questions that aimed to group similar and important aspects of understanding the business model concept, namely: (1) What is a business model 'physically',

enveloping definitions, components, representations and scope; (2) Where is a business model used, focusing on taxonomies and domains of application, and (3) Why is a business model used, addressing its functions and users. These three aspects were mapped onto selected frameworks (Figure 7) showing they cover most of the categories dealing with the understanding, creating and putting business models into operation. Besides that, there are important aspects emerging around managing business models, like change & innovation and performance & evaluation. There are also categories that take an integrative view of many aspects that cannot be directly mapped and need more elaboration.

So is the business model research moving to a more structured level advancing the common understanding of the concept? Yes and no. Some basic aspects are reaching a converging view (e.g. the relationship between strategy and business models) but authors still feel the need to clarify the understanding and use of the concept dealing with foundational issues (e.g. definitions and components). As the term 'business model' became very popular without a clear underlying theoretical foundation, different understandings of the notion are identified and authors call for "a clear elucidation of the assumptions and rationale behind the simplifications made" [6]. On the other hand, specific issues are addressed with profound and focused research (e.g. innovation, evaluation, IS alignment), but also often reflecting the same problem of unclear business model assumptions and sources of difference.

In this paper we have grounded the business model concept by identifying the main converging views on its definition, components and scope and by building upon the most widely accepted framework, the Business Model Canvas. Following the research gaps and directions for future research, we also laid ground for associating strategy, business model and enterprise architecture, the latter being the "issue of the century" and "determining factor, the factor that separates the winners from the losers, the successful and the failures" [75]. It was pointed out that a strategy and the business model concept are underrepresented in the enterprise architecture literature, and that the enterprise architecture concept have not been considered enough in the field of strategy. This mutual gap is calling for closing but this is not an easy task. We have proposed the three potential approaches (some of them have already being addressed in previous works) to associate business model concept and enterprise architecture. Further research is needed to empirically examine those by means of scientific methods.

Acknowledgments

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