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E-BUSINESS MODEL: A CONTENT BASED TAXONOMY OF LITERATURE

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ABSTRACT

The rapid worldwide growth of e-commerce and the resulting great interest on the digital business, caused a proliferation of contributes by academics and practitioners, that identified by different points of view, the fundamental concepts, codes and functions of e-business models. The quantity and the variety of approaches adopted made the concept of e-business model fuzzy and vague, with little consensus about its ontology and definition. The relevance of the topic asserts a claim for the classification of contributions as a first step to a general definition of the concept of e-business model. This paper provides an integrated literature review of contemporary academic writings to ascertain and classify the various approaches to the study of e-business models. The literature examined is classified in a content based taxonomy which highlights the relevant characteristics of e-business model, emerging from the analysis of literature. The framework proposed points out some significant implications that are a first step for further research leading to a research agenda for further investigation on this topic.

Keywords: e-business model; conceptual framework; taxonomy; content analysis; literature review.

1. INTRODUCTION.

Digital technologies are the key for dramatic changes in the society and in the business environment. As in the past the industrial revolution changed the way of living with new ways to produce and create value, thanks to the application of industrial technologies, today the new ICT are changing the society and the market by creating value through communication and sharing of knowledge. The new technological "age" is deeply different and regulated by different rules (Ruefli et al. 2001). The shift from the industrial to the information age carried radical evolutions in the business management, because of the transformation of strategic roles of space and time. The production paradigm (routed in the Ford's model) of the industrial age was based on the Newton representation of space and time which involved:

- A linear conception of time that determined the predictability and accountability of the production function;
- An isomorphic and universal concept of space, characterized by the recurrent sequence of contiguous points where is possible to enclose measurable trajectories.

With the substitution, as the main productive factor, of machines with communication and knowledge, we face a revolution in the concept of time and space. Time doesn't operate anymore in the physical space, becoming instantaneous (or real time) with the creation of virtual spaces. The temporal dimension from continuous becomes punctiform, in order to adapt to the rapid variability of demand and to the speed of communication. Also the change in the spatial dimension is dramatic; the firm is not anymore a physical aggregation in a defined space, becoming a constellation of connections in the virtual space of a network (Normann, 2001). The localization of the production becomes irrelevant; being the time of communication near to zero and the creation of value dependent by the communication of knowledge.

The concept of e-business is a result of this new era and one of the distinctive features of the new competitive paradigm. With the rapid expansion of e-business, firms currently encounter tough business competition in an arena with no borders of space and time. This kind of competition needs a management able to rapidly

interact, take decisions and adapt (Liang et al. 2007; Chang et al. 2011). To be competitive in the new arena it is necessary for the firms to adjust their managerial paradigms to the new features of the environment. Due to the high level of environmental and systemic complexity, firms need to improve their ability to respond to unpredictable changes in the business environment and in their own systemic structure; the flexibility become a primary factor for survival and viability (Dominici, 2008; Philips and Wright 2010; Golinelli 2010).
Firms, who want to effectively implement an e-business model, need to "liquefy" their structures and adapt to the high density of knowledge of the digital competition. E-business knowledge can be created and shared implementing new organizational design and ICT infrastructures (Warkentin et al. 2001).
The implementation of e-business models can play a key role in today's complex and turbulent environment. To implement e-business and gain competitive advantage, the firm must be able to integrate both internal and external information resources and to process them through an integrated communication network.
For this reason e-business has attracted the attention of many scholars in the fields of entrepreneurship and strategic management as Hitt and Ireland (2000) and McGrath and MacMillan (2000) forecasted more than ten years ago. From the exploration of the research area of e-business models emerges the lack of an underlying coding mechanism that would be necessary to understand the primary concepts and the ontological construct of the domain. The quantity and variety of contribution on this topic assert a claim for a rigorous classification. This paper is motivated by the need to clarify what an e-business model is, giving a map to find the way for a comprehensive conceptualization.

2. AIM OF STUDY

The research question to which this paper wants to answer is: "*What are the main thematic indicators, in the literature on e-business models, which can be useful to construct a comprehensive definition of this object of study?*"
Through an exploratory study of the e-business model literature this paper highlights the common research patterns among the various contributions examined. Based on these patterns this study supplies a content based taxonomy that classifies the research on e-business models into relevant domains providing a solid foundation for researchers and practitioners and a guidance for further research on this topic.

3. METHODOLOGY

This paper critically analyzes 50 contributions (44 papers and 6 books) on e-business models, highlighting the main streams of research on e-business models. The overview is delivered in the form of *content based taxonomy*.
The first objective of the review has been to audit reliable literature to identify common themes. The criteria used to evaluate the contributions examined has been that of the *content analysis* (Stone et al. 1966; Holsti, 1969; Krippendorff, 2003) as applied in *grounded theory* (Glaser and Strauss, 1967) with the difference that instead of empirical data, this research used information collected from the relevant literature. An *unsupervised conceptual clustering* (Michalski and Stepp, 1983) approach to the literature assessment was considered useful to get information and combine relevant concepts from various fields. The deliverables of such recombination are the *thematic indicators*, which are encoded synthesizing keywords and contents according to an evaluation conceptual function, pondering the similarity of the topic and of the semantic and ideas used to describe the object of the study. The thematic indicators are then used as categories to build a content based taxonomy of e-business model literature.

3.1. SELECTION OF RELEVENT LITERATURE

The aim of the literature review has been to collate and analyze papers and books reporting solid theories and facts by recognized academics in the field of business modeling. The period of time examined goes from 1994 to present (2011). The search process relied mainly on the use of electronic libraries (e.g. Google Scholar, EBSCO, JSTOR, Sciverse, etc.), by means of keywords.
Overall, 77 sources of information on which 50 on e-business models were accessed and analyzed.
While part of the literature examined was used to define the theoretical framework of the study, 44 journal articles and 6 textbooks on e-business have been classified in the content based taxonomy.

3.2. CONTENT ANALYSIS

To create the content based taxonomy, a content analysis approach has been used. The definitions have been dug out from literature in: business management, web marketing, e-commerce, e-business, operation systems and information systems. Due to the fragmentation and fuzziness of the knowledge about e-business model, there is the need for a classification that can be helpful to clarify the concept. To this scope, content analysis can be a very useful tool for the analysis of textual data, to mine, to construct inferences and to recognize common shared properties.

Krippendorf (2003, p. 18) defines the content analysis as: "*a research technique for making replicable and valid inferences from text (or other meaningful matter) to the context of their use*".

Holsti (1969) underlines that content analysis is: "*any technique for making inferences by objectively and systematically identifying specified characteristics of message*".

The logic of inference adopted in this study is that of *abductive inference* that proceeds across distinct logical domains, from text to the answer to the research question (Krippendorff, 2003).

The classification is that coming from the need of context and is not predetermined.

As Parsons and Wand (2008) pointed out: "*Classification holds that classes do not exist independently, but are constructed as useful abstractions of the similarities of the classified phenomena*".

The contributions examined are categorized according to the criteria above in a content based taxonomy of the literature examined from which emerge several relevant characteristics (thematic indicators) of the e-business model research.

4. LITERATURE REVIEW

The only point on which we can find a general agreement in the literature is that e-business models are probably the most discussed, yet less understood topic of electronic business research (among the others: Alt and Zimmerman, 2001; Gordijin and Akkermans, 2001; Dubosson-Torbay et al. 2002; Pateli and Giaglis, 2003; Hayes and Finnegan, 2005; Gordijin et al. 2005; Rappa, 2010; Chang et al. 2011; Basu and Muylle, 2011).

Starting from the various definitions of business model, to arrive to those of e-business model, this paper will try to give order to the fuzzy and chaotic literature.

From the analysis of the literature emerged that there are six main themes, that here we call "*thematic indicators*":

1. *General Definition;*
2. *Architecture, Decomposition and Ontology;*
3. *Creation of value and revenues;*
4. *Knowledge sharing capabilities;*
5. *Change and/or growth models;*
6. *Classification and taxonomy.*

Table 1 summarizes the contributions according to the thematic indicators above.

Table 1. Taxonomy of the literature about e-business model.

		Thematic Indicators					
No.		General Definition	Architecture, Decomposition and Ontology	Creation of Value and Revenues	Knowledge sharing capabilities	Change and/or Growth	Classification and/or Taxonomy
1	GALLIERS & SUTHERLAND (1994)					√	
2	HOFFMANN ET AL. (1995)	√					√
3	HOFFMANN & NOVAK (1997)	√			√		
4	TIMMERS (1998)	√	√	√			√
5	VENKATRAMAN & HENDERSON (1998)		√		√		
6	EARL (2000)					√	
7	HANSON (2000)			√			
8	HOFACKER (2000)				√		√
9	KAPLAN & SAWHNEY (2000)			√			√
10	KLEIN & LOEBBECKE (2000)			√			
11	KRAEMER ET AL. (2000)			√			
12	MAHADEVAN (2000)			√			√
13	MAHAJAN & VENKATESH (2000)			√			√
14	McKAY ET AL. (2000)					√	
15	AFUAH & TUCCI (2001)		√	√			
16	ALT & ZIMMERMANN (2001)						√
17	AMIT & ZOTT (2001)			√			
18	FENSEL (2001)	√	√				
19	GORDIJIN & AKKERMANS (2001)			√			
20	PAPAKYRIAKOPOULOS ET AL. (2001)					√	
21	PETROVIC ET AL. (2001)	√	√				
22	WARKETIN ET AL. (2001)				√		√
23	WEILL & VITALE (2001)	√	√	√	√		√
24	DUBOSSON-TORBAY ET AL. (2002)		√	√			
25	LEE ET AL. (2002)			√			
26	OSTERWALDER & PIGNEUR (2002)	√	√	√			
27	PIGNEUR (2002)	√					
28	PRANANTO ET AL. (2002)					√	
29	BARNES ET AL. (2003)				√	√	
30	BASU & MUYLLE (2003)		√	√			
31	CHEN (2003)			√			
32	HEDMAN & KALLING (2003)	√					√
33	LAM & HARRISON-WALKER (2003)	√					√
34	PATELI & GIAGLIS (2003)						√
35	GROVER & RAMANLAL (2004)			√			
36	LEEM ET AL (2004)			√			
37	LUMPKIN & DESS (2004)			√			√
38	MELVILLE ET AL. (2004)	√		√			
39	GORDIJIN ET AL. (2005)	√	√				√
40	HAYES & FINNEGAN (2005)		√	√	√		√
41	ARIGUZZO ET AL. (2006)					√	√
43	CAZIER ET AL (2006)			√			
42	GHACHEM (2006)					√	
43	MALONE ET AL. (2006)			√			√
44	VESCOVI (2007)	√		√			√
45	PARSONS & WAND (2008)						√
46	PHILLIPS & WRITE (2009)				√		
47	RAPPA (2010)	√		√			√
48	AL-DEBEI & AVISON (2010)	√					√
49	BASU & MUYLLE (2011)	√	√	√			
50	CHANG ET AL. (2011)			√			

As we can see in table 1, the majority of the contributions examined covers more than one thematic indicator. In the 50 contributions examined, the most frequent thematic indicator is "*Creation of value and revenues*" that is covered in 27 contributions followed by "*Classification and taxonomy*" that is covered in 21 works, "*General Definition*" in 16, "*Architecture and components*" in 12, "*Change and/or Growth*" in 8 and "*Knowledge sharing capabilities*" in 8 works.
We will examine the peculiar aspects of the thematic indicators found in the literature overview.

4.1 GENERAL DEFINITION
A correct ontological definition of e-business model brings to several advantages (Osterwalder and Pigneur, 2002):

- Helps the managers to communicate their knowledge to the stakeholders (Fensel, 2001);
- Facilitates the comprehension of the determinant factors and interrelations;
- Creates a comparability between models and the consequent possibility to create a benchmarking system;
- Gives the possibility to acknowledge the relevant factors that allow building simulations of different models, thus supplying useful catalogs for the decision making process (Stermann, 2000).
- In order to analyze the different concepts of e-business model, it is useful to observe also the more generic definition of "*business model*". This is also because, for many authors, the concept of business model is blurred in the domain of e-business model. The concept of business model is of course older than that of e-business model and can be tracked back in the 1930's with a first definition as "*entrepreneurial innovation*" of Schumpeter (1934).

The main definitions of business model are:

- *A model of entrepreneurial innovation* (Schumpeter, 1934, 1950);
- *The architecture for the product, the service and information flow on which business relation are based* (Timmers, 1998);
- *A business concept put into practice* (Hamel, 2000);
- *A loose conception of how a company does business* (Porter, 2001);
- *A business idea in a system including the offering and internal and external factors* (Normann, 2001);
- *A depiction of the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities.* (Amit and Zott, 2001);
- *A description of the logic that lies behind the firm's business processes* (Petrovic et al. 2001);
- *A story that explains how an enterprise works* (Magretta, 2002);
- *A description of the key components of a given business* (Hedman and Kalling, 2003);
- *A method to make money* (Afuah and Tucci 2001).

As we can see, these definitions involve a wide range of aspects and do not give a complete view of the phenomenon. The same happens for the e-business model concept that, according to many authors, derives from the more generic business model concept. According to this view the e-business is the mere application of the business model in a digital business environment.
Nevertheless, simply translating the business model concept into the e-business could be a bad guidance for businesses. As stated in a pioneering article by Hoffman and Novak (1997, p. 1):
"*Web presents a fundamentally different environment for marketing activities than traditional media, conventional marketing activities are becoming transformed [...]these changes portend an evolution in the "marketing concept" [...] in order for marketing efforts to be successful in this new medium, a new business paradigm is required*".
The digital e-business environment empathize the digitalization of product and service offerings and creates a set of transactional conditions that diverge from those characterized by physical products. Indeed, to be effective, an e-business model must be deeply contextualized in the digital business environment that has peculiar characteristics of space, time and competition (Mahajan and Venkatesh, 2000; Dominici, 2009). The Internet provides a unique production and competition arena for business activities, which firms, in order to succeed, have to consider both at organization and strategic level.

4.2 ARCHITECTURE, DECOMPOSITION AND ONTOLOGY

The aim of decomposing the object in order to create ontology is to build a shared, formal, and explicit conceptualization of (in our case) an e-business model.

Timmers (1998) has been the first to supply a well structured definition of e-business in terms of "*architecture for products, services, and information flows, including a description of various business actors and their roles*" (p.4). Also Venkatraman and Henderson (1998) depicted the e-business model for the dot-com companies as "*a strategy that reflects the architecture of a virtual organizatio*n" (p.33).

Osterwalder and Pigneur (2002) propose an e-business model ontology that they define as a ''*rigorous definition of the e-business issues and their interdependencies in a company's business model*''. The e-business model ontology they propose spots four main aspects of the organization: *product innovation, infrastructure management, customer relationship and financials*.

Also Duboson-Torbay et al. (2002) divide the e-business model concept into four principal components: *products and services, relationship capital, network infrastructure and financial aspects*. Petrovic et al (2001) point out how an e-business model can be divided into seven sub-models: *value model, resource model, production model, CRM model, revenue model, capital model and market model*. Gordijin et al. (2005) compare two business model ontologies, the Business Model Ontology (BMO) and the "*e3 value ontology*", for the design of business models and value constellations. Basu and Muylle (2003) present a multi-layered e-commerce architecture, which consists of three levels of services: network services, commerce services, and content services. Hayes and Finnegan (2005) determine a measurement for the operational as of e-business, first decomposing the e-business model into five operational characteristics: *economic control, functional integration, supply chain integration, innovation and sourcing*. Then they relate these characteristics to the most common e-business models and evaluate them in a five points Likert scale.

4.3. CREATION OF VALUES AND REVENUES

This field of research studies the ways through which firms use the characteristics of the Internet to build e-business models with the aim to add value and generate revenues.

According to Hanson (2000) the value creation in e-business can have two different natures: *improvement-based* and *revenue-based*. Improvement is based on enhancement models (brand building, quality, etc.), efficiency models (cost reduction, free trial, etc.) and effectiveness models (dealer support, supplier support, etc.). Revenue-based models are provider-payed models or user-payed models. In other words according to Hanson the advantages of implementing an e-business model are either to enhance the current methods of doing business or to generate revenues through traffic on a website. Kaplan and Sawhney (2000) focus their analysis on business to business (B2B) electronic business models to build a *B2B e-business matrix*. Klein and Loebbecke (2000) analyze the pricing dynamics of e-business. Kraemer at al. (2000) study the successful e-business model of Dell computers. Mahajan and Venkatesh (2000), study how marketing drivers can create value and revenues in the digital context. Gordijin and Akkermans illustrate the use of the *e3-value methodology* to present an e-business modeling approach that combines the IT systems' approach with the economic value perspective from business sciences. Lee et al. (2002) employ an event study methodology to assess the cumulative abnormal returns of 782 e-business initiatives by firms listed in Korean capital markets and to verify empirically the "*dot.com effect*". Chen (2003) examines the main factors of success and the causes of failure of e-business models to find out which could be the key factors determining the survival or failure of e-firms. Grover and Ramanlal (2004) highlight the supplier strategies and e-business paradoxes and classify them according to four information-age strategies: *versioning, confounding, network effects and pricing*. Lumpkin and Dess (2004) shed the light on four value-adding activities that have been enhanced by Internet capabilities: *search, evaluation, problem-solving, and transaction*. These four activities are supported by three different types of content that are common in e-business models: customer feedback, expertise, and entertainment programming. Melville et al. (2004) develop a resource-based view model of e-business value, which integrates various findings of other researches into a single framework. Vescovi (2007) describes nine types of business models according to the way they generate revenues: connection model, mass media model, e-commerce model, subscription model, consumption model, affiliation model, information media model, broker, and meta media model. Chang et al (2011) present a theoretical model based on the information

systems' characteristics' that evaluates the effects on end-users' perception of computer self-efficacy and outcome expectations for e-business success.

4.4 KNOWLEDGE SHARING CAPABILITIES

In the knowledge based business environment of the Internet, organizations need to redesign their internal and external structure of relationships in order to create knowledge networks to empower knowledge creation. E-business knowledge can be created and shared more effectively by a combination of new organizational designs and the adoption of digital technologies.

Hofacker (2000) summed up e-business models as possessing four basic functions: *communicating, selling, providing content and providing a network function*.

Weill and Vitale (2001) point out that knowledge can generate value in two ways: first by codifying the knowledge of the individual human resources and inside the process and making it available through the whole organization; second by making this knowledge identifiable by costumers and business partners.

Warketin et al. (2001) present a framework in which they discuss the benefits and the shortcomings of the inter-organizational information systems in the view of the creation of e e-knowledge networks such as supply chain networks, adserver networks, content syndication networks, and B2B hubs. They conclude by analyzing the technologies that can impact on e-knowledge networks.

Barnes et al (2003) assert that new thinking is required to match that at the corporate level. This implies the need to integrate an explicit consideration of information systems strategy regarding the ways to share information and knowledge.

Phillips and Write (2009) state that the ability to respond to unpredictable changes in the market is a key factor for the survival of firms. A high level of flexibility is required to adjust e-business processes to customer preferences. They first analyze the result of five case studies to develop a seven factors' model: *alliance/joint decision management and intelligence, enterprise-wide change management, organizational learning, process oriented agility, network centric information management, leadership of transformation and knowledge exchange meetings*; then they use this model as a benchmarking tool. The managerial implications of their findings are that knowledge capabilities of human capital are the key factors for the success of e-business models and they illustrate how the model proposed can be a useful tool for the management to find the relevant needs of ICT capabilities in the organization.

4.5. CHANGE AND/OR GROWTH

The e-business growth models try to grasp and to depict the subsequent levels of "maturity" of firms in utilizing the potential of the ICT.

Galliers and Sutherland (1994) were the first to propose a six steps framework of growth of ICT adoption in the firm. McKay et al (2000) integrate the Galliers and Sutherland framework and propose a six (4/4+2) maturity steps framework of e-business growth called *SOG-e* (Stages Of Growth for e-Business).

The SOG-e model recognizes the coexistence in the organization of different levels of maturity for the different aspects of ICT integration.

Also Earl (2000) suggests that firms involved in the digital environment have to go through six steps of learning to reach the full e-business potential: *external communication, internal communication, e-commerce, e-business, e-enterprise and transformation*. These steps can also be simultaneous depending of the nature of the business and the strategy.

Papakyriakopoulos et al. (2001) highlight a step-by-step methodology for transforming a business model, thus responding to the need for changing the firm's technology infrastructure.

Ghachem (2006) states that the e-business growth models reveal that firms should evolve relentlessly following the evolution of digital communication tools. Companies must constantly innovate to adapt themselves to continuous environmental changes. Dynamic business and management models are necessary to adapt to the liquid knowledge economy, which provides at the same time, many opportunities and threats. Hence, the key to success is the building of a learning organization that may encourage the involvement of all its members to the development of company knowledge.

4.6. CLASSIFICATION AND TAXONOMY

The taxonomies of e-business model that can be found in the literature are usually based on two factors of classification: *the criteria to classify e-business models* and/or *the objects classified*.
In the latter we can find Parsons et al. (2008) who adopt a cognitive approach of inference to obtain a set of principles to draw their taxonomy. They present a model for characterizing and contextualizing classes, based on the inferences that can be drawn from membership in a class, and they use this foundation to suggest design rules for evaluating and refining potential classes.
Al-Debei and Avison (2010) through a review of the literature, employ the content analysis method and a deductive reasoning approach to present a hierarchical taxonomy of the business model concept.
In the former criteria of classification we can find the studies of Timmers (1998) who classifies the e-business models in a taxonomy based on the way to generate revenues; Kaplan and Sawhney (2000) that build a taxonomy of e-business models for B2B hubs, Vescovi (2007) who develops Timmer's taxonomy adding new elements and Rappa (2010) who presents a taxonomy of e-business models observed on the web, listing twenty nine different business models within nine categories.

5. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

In this paper an integrated literature review of contemporary academic writings has been provided to ascertain the various points of view for the definition of the concept of e-business model. The literature examined has then been classified in a content based taxonomy. This taxonomy can be useful to comprehend the state of the art of current research in the field of e-business and to think about new direction of study that can be useful for strategic management of firms operating in the digital arena.
As highlighted by Mahajan and Venkatesh (2000) available theories and approaches may be insufficient in tackling many e-business problems. Given the peculiarities of the digital context, research on e-business should be careful in adopting traditional models. To give effective result it is important to focus on what is new about the problem in terms of theory and methodology. In general, more caution is needed in applying an available approach to address a relatively new phenomenon like e-business. It could be useful to create a universally accepted definition of e-business model that takes into consideration the difference with the bricks and mortar definition of business model and is compatible with the peculiarities of the digital environment in terms of space, time and competition.
Even if today the foundations of e-business model concept have been established, more research is necessary to find credible future direction and organizational implication of e-business adoption in the complex business environment of the XXI century. To this aim further development of methodological approaches to the study of e-business models is needed.

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