



STRATEGIES EMPLOYED BY E-COMMERCE FIRMS IN PORTUGAL: AN EMPIRICAL INVESTIGATION

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Abstract

A survey integrating different theoretical views of value creation was developed, then sent to Portuguese e-Commerce firms to assess the underlying dimensions and the most important characteristics of their e-Commerce strategies. The survey was sent to 188 firms in 2007 and repeated in 2010 to validate the results, obtaining a total sample of 62 e-Commerce firms.

Through factorial analysis, three e-Commerce strategy dimensions were identified: one relates to differentiation via marketing based on reputation and brand identification, in which advertising and innovation in marketing techniques and methods are important; a second differentiation dimension focuses on product development and is supported by technical capabilities; and a cost leadership dimension which uses strategic networks to obtain economies of scale and scope, and exploits technological advancements to reduce transaction costs.

Keywords: E-commerce; strategy; value creation; virtual markets

1. INTRODUCTION

Electronic commerce – or e-Commerce – deals with the facilitation of transactions and selling of products and services on-line, i.e. via the Internet or any other telecommunications network (Jelassi and Enders, 2005). It could be considered a subset of e-Business, which refers to business conducted over the Internet or any other electronic means.

For the purpose of our research, we define an e-Commerce firm as one that derives part of its revenues from transactions conducted over the Internet (all business models were considered, including B2C and B2B, where some kind of e-Commerce activity is performed). We use the term virtual markets to refer to settings in which business transactions are conducted via open networks based on fixed and wireless Internet infrastructure (Amit and Zott, 2001), and value created should be understood as the difference between the consumer's perceived benefit from a given product/service and the firm's cost in providing that product/service (Jelassi and Enders, 2005).

Strategy is concerned with the long-term direction of the firm, which implies an overall plan for deploying the resources that a firm possesses in order to achieve a sustainable competitive advantage over rivals, thereby assuring lasting profitability (Jelassi and Enders, 2005). Strategy is the ability to define a unique value proposition, and a willingness to make trade-offs in what not to do (Porter, 2001). An e-Commerce strategy should focus on how a firm deploys the resources at its disposal to facilitate the achievement and maintenance of competitive advantages in virtual markets.

Every business today competes in two worlds: a physical world of resources that managers can see and touch and a virtual world made of information (Rayport and Sviokla, 1995). The latter has given rise to e-Commerce, which constitutes a new locus of value creation.

E-commerce is growing fast and the use of Internet has accelerated value innovation in service dimensions of speed, convenience, personalization and price. Therefore, the customer value proposition is changing, transforming the notion of value (Kalakota and Robison, 2000). In fact, the Internet is changing patterns of competition among companies, thereby creating new opportunities and simultaneously affecting the way well established firms traditionally conduct their business (Hitt, Ireland *et al.*, 2001). But virtual markets have specific characteristics, the most relevant of which are their high connectivity (Dutta and Segev, 1999), the focus on transactions (Balakrishnan, Kumara *et al.*, 1999), the importance of information goods and networks (Shapiro and Varian, 1999) and the high reach and richness of information (Evans and Wurster, 1999). The global reach of web technologies enables cost efficient means of reaching out to new markets, attracting new costumers, and delivering products and services (Chatterjee, Grewal *et al.*, 2002).

In this context, it could be discussed if we are in the presence of a revolutionary change or an evolution enabled by new technologies (Coltman, Devinney *et al.*, 2001), and if traditional theories are still valid.

The objective of this research is to identify e-Commerce strategy dimensions and their characteristics, based on the value creation process, in order to provide guidelines for e-Commerce strategy definition. From the academic standpoint, the results could constitute a framework for future analysis, and the research could corroborate the usefulness of integrating entrepreneurship and strategic management theories to study the phenomenon of e-commerce.

The confluence of the entrepreneurship and strategy research streams has been advocated by Hitt and Ireland (Hitt and Ireland, 2000) and by McGrath and MacMillan (McGrath and MacMillan, 2000), and an integrated approach of theoretical views of the value creation process was applied by Amit and Zott to identify the sources of value creation in e-business (Amit and Zott, 2001). Moreover, although some theories were said to be fundamentally different, nowadays it is argued that they actually complement each other, giving a better understanding of the phenomenon of value creation, and it is considered that they share a common underlying thinking (Jelassi and Enders, 2005). Because the overall objective of a firm's business model is the exploitation of a business opportunity by creating value for the parts involved, which is reflected in the customer value proposition (Amit and Zott, 2009), to identify the underlying strategy of an e-commerce firm, it is important to concentrate on the process by which it intends to create value. Therefore, considering the specific characteristics of virtual markets, to explain the process of value creation in e-Commerce, it is necessary to integrate different theories.

Although not in the scope of this research, it should be acknowledged that other theories have been applied in the information systems area, contributing to a better understanding of the e-Commerce phenomenon. From this field of research, for example, we retained that institutional factors such as top management championship, strategic investment rationale and higher levers of coordination could leverage the assimilation of web technologies in e-Commerce activities (Chatterjee, Grewal *et al.*, 2002), and that e-Commerce should be pursued as a strategic initiative rather than as an appendage to an existing organization, in order to garner the appropriate resources and create unique capabilities necessary to compete in the virtual market (Chang, Jackson *et al.*, 2003).

In the theory section we present a literature review of value creation theories and discuss their applicability and limitations in the context of virtual markets. Thus we review the market-based view, the resource-based view, Schumpeterian innovation, strategic network theory, and transaction cost economics, highlighting the importance of information in the context of virtual markets and its effects on the value chain. We end the section with a description of the relations between the dif-

ferent views, justifying their integration for a better understanding of e-Commerce strategies. Then we will present the methodology employed, the results and the conclusion.

2. THEORY

2.1 The market-based view and the physical value chain

The market-based view (Porter, 1985) analyses value creation at the corporate level through the value chain concept, in order to identify which activities a company should do and how they should be done, as well as the configuration of firms' activities that allow the addition of value to the product or service, thus improving their competitive position in the industry. Value creation could be obtained by differentiation along the stages of the value chain or by reducing costs for the buyers. The crescent sophistication and prevalence of technologies of information, particularly the Internet, reinforce the concept of the value chain (Koh and Nam, 2005).

On the market-based perspective, at the broadest level, firm success is a function the attractiveness of the industry in which the firm competes and its relative position in that industry (Porter, 1991). The industry attractiveness results from the combination of five forces: 1) the rivalry among existing competitors; 2) the bargaining power of suppliers; 3) the bargaining power of customers; 4) the threat of substitute products or services; and 5) the existence of barriers to entry, and companies should adapt their strategy to their competitive environment (Porter, 1985).

The competitive advantage is a result of low costs or differentiation, which when combined with the strategic target, which could be narrow or broad, result in four generic strategies. To obtain a sustainable competitive advantage, a company should concentrate in only one generic strategy, avoiding a situation of being *stuck in the middle*, in which the firm is blocked between two strategies, damaging its profitability and its market share prospects. Some factors – such as development of new technologies, greater efficiency, economies of scope, and learning effects – diminish the choice between reducing costs or optimizing quality. Porter admits exceptional situations that make it possible to develop more than one generic strategy, such as the introduction of a new technology or innovation that allows more differentiation while at the same time introducing the possibility to reduce costs.

Although Porter identifies some trends related to the influence of the Internet in the industry structure, he argues that it is not possible to extract general conclusions about the impact of the Internet on the long-term profitability, since

the power of each of the five forces differs from industry to industry (Porter, 2001). In short, he predicts negative trends, such as an increase in the number of competitors since barriers to entry are weak and the technology is becoming more available as time goes by, and a rise in customers' power because of low switching costs and higher familiarization with this technology. On the other hand, he highlights that the Internet provides an opportunity to improve profitability since it allows a greater proximity to customers, which could be used to increase or differentiate the companies' offer. In his opinion, the modifications introduced by the Internet in the competitive environment underscore the necessity for companies to differentiate by a strategic positioning (Porter, 2001), and suggests that there are no electronic strategies, but only strategies, arguing that only by incorporating Internet in a global strategy will it be possible to use this new technology as a powerful force of competitive advantage. Moreover, although Internet associated applications have an influence on the cost and quality of the activities, they are neither the sole, nor the dominant influence (Porter, 2001). Conventional factors like scale, personal talent, product, and process technology also have an important role, leaving most of the sources of competitive advantage present in the off-line landscape intact.

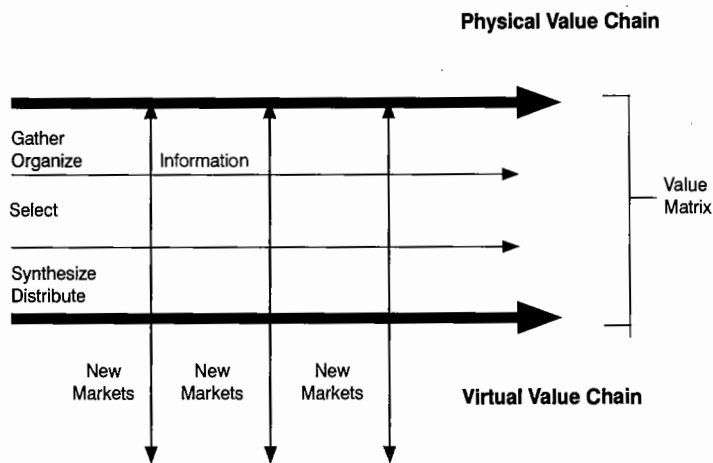
In fact, with the Internet innovative companies can obtain advantages at the costs level as well as at the differentiation level, at least initially; but, if the Internet makes it possible to maintain systematically lower costs and offer greater value, all companies must use it or they will go out of business, in which case it will be no longer a source of differentiation, which reinforces the need for a strategic position (Jelassi and Enders, 2005).

2.2 The virtual value chain and the disintegration of the value chain

The value chain model introduced by Porter does not capture all the essence of the mechanisms of value creation in a context of e-commerce, given the importance of the process of information flow treatment. Rayport and Sviokla introduced a virtual value chain concept based on information that considers the existence of two worlds: one of physical reality (*marketplace*) and one of virtual reality (*marketspace*), constituted by information, which does not substitute the first one, but complements it (Rayport and Sviokla, 1995). The processes of value addition in the physical world and in the virtual world are different, although interdependent, making it necessary to understand each process to create and capture value in both markets in an effective way. The process of value creation in the virtual world involves gathering information, organizing it for the customer, selecting what is valuable, packaging (or synthesizing) it, and distributing it. This determines a value matrix that allows the creation of new products and services,

making it easier to find consumer necessities. Thus, the ability to perform this process and act on information faster than the competition is a hallmark of all leading companies (Blase, Sviokla *et al.*, 2006).

FIGURE 1
The value matrix



Source: Rayport, J. F. e Sviokla, J. J. (1995) Exploiting the virtual value Chain, Harvard Business Review, p. 82

In e-Commerce it is necessary to integrate two kinds of activities and depending on products and services characteristics, the relative importance of the virtual value chain and of the physical value chain will be different (Bhatt and Embad, 2001). In the physical value chain, the information captured was used only as support of the value-adding process, while in the virtual value chain the role of information is strategic. Moreover, the virtual value chain can be of importance in the disintegration of many physical intermediaries while introducing new types of intermediaries based on information. Using information intermediaries, consumers could do one-stop shopping of several products and services of different companies. In fact, information has become as important as products and services themselves (Hagel III and Singer, 1999). In some cases, the value of the products has been substituted by contents of information. This is the case of CDs, which have been replaced by downloads made from the web. As more information about products and services becomes available for customers in an immediate way and information is transmitted by the Internet, disintermediation occurs and traditional intermediaries become obsolete, and the logic that supported some industries, like travel agencies, begins to disintegrate

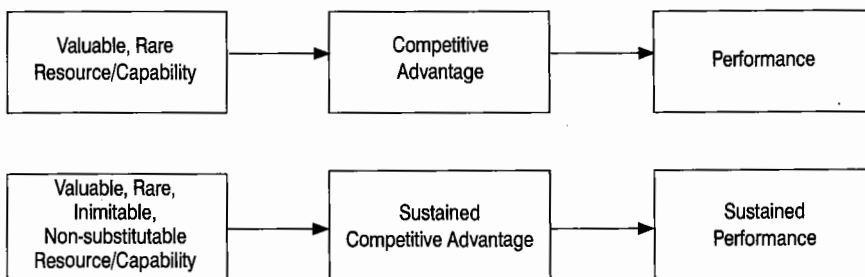
(Shapiro and Varian, 1999). At the same time, new ways of creating value are opened up through new ways of connecting sellers and buyers (re-intermediation) and by innovative market mechanisms, like for example reverse market auctions.

2.3 The resource-based view

Edith Penrose was the first to recognize the importance of resources utilization to the competitive position of the firm (Penrose, 1959). Wernerfelt has contributed to the formalization of this theory, referring that firm performance depends directly on its products and indirectly on the resources that give rise to them (Wernerfelt, 1984). The resource-based view has gained a body with Jay Barney, who develops the arguments of Penrose, Rumelt and Wernerfelt (Barney, 1991). The firm is seen as a bundle of resources and capabilities, and the unique combination of specific resources and capabilities, which should be heterogeneous, rare, durable and not easy to copy or to buy, constitutes the source of value creation.

FIGURE 2

Firm resources and sustained competitive advantage



Source: Barney (1991) – Firm resources and sustained competitive advantage, Journal of Management

Firms have portfolios of heterogeneous resources, acquired through history, accident or design, and this heterogeneity is responsible for the financial performance variability observed (Peteraf, 1993). Through this approach, a company could determine which resources should be developed internally, and by analysing the firm resource position, it would be possible to assess if there are conditions to build a sustained competitive advantage.

The concept of the dynamic capabilities (Teece, Pisano *et al.*, 1997; Eisenhardt and Martin, 2000) is an interesting development of this theory, suggesting that a company should have the capacity to integrate, build and reconfigure

internal and external competencies in order to adapt rapidly to changes in the competitive landscape, which is even more important when time-to-market is critical. Technological change moves fast, making it difficult to determine the future evolution of the market. The development of virtual markets requires innovative answers and makes it possible to explore even more relationship capabilities, enhancing complementarities between firm resources and capabilities (namely on-line and off-line capacities), leading to new ways of value creation.

Technological resources are valuable within a resource-based view logic, but they do not explain a significant variance in the customer service process performance (Powell and Dent-Micallef, 1997): technological resources appear to be a temporary source of differentiation, since they are easy to copy and seem to be the kind of investment firms must make if they want to have a focus on the customer. Although IT could be used to leverage complementary intangible resources linked to the business or to human resources and add value, previous studies suggested that only the capacity to manage IT can represent a source of competitive advantage (Mata, Fuerst *et al.*, 1995). This is consistent with the idea that intangible resources, being socially complex and hard to understand and copy, have a greater probability of determining a competitive advantage than tangible resources (Barney, 1991): an intangible resource like a firm's reputation can be a strategic resource since it facilitates access to financial capital (Deephouse, 2000), and customers tend to rely on a firm's reputation when the quality of a product or service is uncertain (Hitt, Ireland *et al.*, 2001).

2.4 Innovation in the context of virtual markets

According to Schumpeter, innovation is the main source of value creation (Schumpeter, 1942), and the development of new products, new services and new production methods is driven by technological change and new combinations of resources, being entrepreneurship fundamental to the recognition, organization and conduction of change, in the context of organizations. The concept of creative destruction emphasizes how some rents are appropriated by entrepreneurs when a technological change occurs, and how the rents diminish as the innovations become generalized. First movers temporarily enjoy monopolistic rents while competitors cannot copy them or find a substitute. This could be the case of some e-commerce firms.

Moreover, the developing of virtual markets brings new opportunities for innovation: they enlarge firm and industry boundaries, involve new mechanisms and new transaction methods, and allow new forms of collaboration between firms.

2.5 Strategic networks

Nowadays there are alternatives to the ownership and control of resources, which do not compromise the sustainability of value creation, and the concept of *coopetition* is spreading, with many firms cooperating and competing at the same time. A new and more competitive business environment demands new kinds of business relationships, therefore, 'co-opetive' partnerships have emerged as a more effective response to changed environmental threats and opportunities (Zineldin, 2004). Strategic networks allow access to information, markets and technologies (Gulati, Nohria *et al.*, 2000), generate economies of scale and scope (Shapiro and Varian, 1999), reduce risks, facilitate learning and knowledge transfer (Anand and Khanna, 2000), (Dyer and Singh, 1998), shorten time-to-market (Kogut, 2000), improve transactional efficiency and reduce asymmetry of information (Gulati, Nohria *et al.*, 2000), and can foster credibility and legitimacy to participants and leverage the identification of new opportunities (Cooper, 2001). Moreover, strategic partnerships enable access to resources and capacities to entrepreneurs (McEvily and Zaheer, 1999), which allows them to compete in the market. In particular, external networks can have great value since they can be an opportunity to learn new capabilities (Anand and Khanna, 2000).

Although the potential to create value in virtual markets could be enhanced by strategic networks, value preservation and therefore value creation could be more difficult to sustain, since the access to substitute resources could also be available to competitors.

2.6 Transaction cost economics

Transaction costs theory identifies the efficiency of transactions as the main source of value creation, and it was used to justify options to internalize transactions that could be conducted by markets (Coase, 1932). Subsequent development of this theory focused on the identification, explanation and mitigation of contractual risks in order to minimize costs, assuming that individuals and firms have opportunistic behaviours, need assets with a given frequency, and that some assets that are unique must be acquired to achieve personal and corporate objectives. Transaction cost economics has become more operational with Williamson, who analyses firms as governance structures, identifying particular characteristics of transactions (Williamson, 1975).

Transaction costs are the searching, monitoring, and enforcement costs that have to be borne to allow a market exchange between two parts to take place (Lee, Lee *et al.*, 2001). One transaction has value by itself, since it reflects the most efficient option to perform it and constitutes a source of transactional efficiency

(Williamson, 1983), and value creation could be an outcome of the attenuation of uncertainty, complexity, asymmetry of information, and the conditions of the negotiation (Williamson, 1979). One of the main effects of the Internet is the reduction of transaction costs (Benjamin and Wigand, 1995). The Internet allows a reduction not only in the direct costs of economic transactions, but also in the indirect costs, such as adverse selection, since it facilitates the access to information, as well as the establishment of relations between different entities (Lee, Lee *et al.*, 2001), even though the lack of trust related with agents' behaviour is higher than that which is observed in traditional channels (Childers and Offstein, 2007). The quality of some products, such as those belonging to the 'look and feel' category, is difficult to access, which requires a stronger effort to promote safety and reputation to reduce consumers' fears (Nataraj and Lee, 2002).

2.7 Integration of different views of value creation in the context of e-Commerce

The market-based view starts with an external analysis, assessing the industry attractiveness to determine a strategic positioning (Porter 1985), and focuses on activities as a source of competitive advantage, suggesting that firms excel because of what they do. The resource-based view begins with an internal analysis, assessing which firm competencies could enable a competitive advantage in a specific industry, defending the primacy of resources and corporate capabilities as a source of competitive advantage and suggesting that firms excel because of what they are (Wernerfelt, 1984), (Rumelt, 1984), (Barney, 1991). However, in spite of the different approaches, there are points of contact between these two perspectives since the core competence perspective cuts across different functional areas within a firm, suggesting that the understanding of the relation between firm resources and the efficacy of its routines and business processes could lead to a better explanation of firm performance (Ray, Barney *et al.*, 2004). Moreover, the stress on resources must complement and not substitute the stress on market positions (Porter, 1991). Therefore, considering the characteristics of virtual markets given the importance of information and technology, and considering the modifications in the competitive landscape prompted by information and technology, companies should have the capacity to adapt by integrating, building and reconfiguring internal and external competencies as suggested in the dynamic capabilities theory (Teece, Pisano *et al.*, 1997). In fact, Teece *et al.* advocate that global competitive battles in high-technology industries have demonstrated the need for an expanded paradigm to understand how competitive advantage is achieved, and they refer to the ability to achieve new forms of competitive advantage as "dynamic capabilities".

The theory of dynamic capabilities is especially relevant in a Schumpeterian world of innovation-based competition, and virtual markets offer new opportunities for the development of new products, new services and new production methods, leading to new combinations of resources. Thus, the importance of entrepreneurship and innovation in this context is justified, in particular the concept of creative destruction (Schumpeter, 1942), which explains how some rents are appropriated by entrepreneurs when a technological change occurs. However, the rents diminish as the innovations become generalized, which could reinforce the need for a strategic positioning as advocated by Porter (Porter, 2001) and Jelassi and Enders (Jelassi and Enders, 2005).

On the other hand, the opportunity for innovation and for the new combination of resources, and the capabilities required to combine the activities of the physical and the virtual value chain justify the use of strategic networks theory, since they enable access to resources and capacities to entrepreneurs (McEvily and Zaheer, 1999) and constitute an opportunity to learn new capabilities (Anand and Khanna, 2000). Moreover, strategic networks enable access to information, markets and technologies (Gulati, Nohria *et al.*, 2000), generate economies of scale and scope (Shapiro and Varian, 1999), and improve transactional efficiency. The importance of resources and capabilities of network partners for a firm's performance justifies the integration of strategic networks theory and the resource-based view (Afuah, 2000; Gulati, 1999), and the existence of asset specificity, demand uncertainty, and task complexity and frequency justify the constitution of strategic networks, therefore integrating transaction cost theory with strategic networks theory (Jones, Hesterly *et al.*, 1997).

Last but not least, because one of the main effects of the Internet is a reduction in transaction costs (Benjamin and Wigand, 1995), this theory of value creation should be included in an analysis of e-Commerce strategies since value could be created by the reduction in transaction costs (Foss and Foss, 2005). However, the transaction cost theory has some limitations since it ignores the attributes of resources and management skills, and forgets activities related with innovation (Ghoshal and Moran, 1996). Therefore, integration of transaction cost economics with the resource-based view would better explain the sources of competitive advantage (Madhok, 2002). While transaction costs economics focuses on *the* firm, justifying why firms exist, the resource-based view is the theory of a (particular) firm and how firm resources and capabilities can be managed for competitive advantage. A strategic theory of the firm should take in account the two approaches (Madhok 2002). Moreover, transaction costs influence the value that a resource owner can create and appropriate (Foss and Foss 2005), and, given the importance of information, the transaction costs approach could describe properly the potential of information technology to improve information flow and to reduce transaction costs, thereby improving efficiency (Cordella 2006).

3. METHODOLOGY

3.1 Sample

E-Commerce firms are the unit of analysis of our research, and e-Commerce strategies are the phenomenon of inquiry.

For the first survey, a list of Portuguese e-Commerce firms was created including members of Portuguese e-Commerce Association, and a search was conducted through the Internet, using the search engine AEIOU introducing the term '*site de comércio electrónico*' or '*lojas on-line*', and other sites referred to in a previous Markttest study. The list was filtered to eliminate repeated names, foreign firms' sites and the ones without contacts. In the end, a list of 188 companies was compiled and a survey was sent to each of them, by e-mail, between the 15th of June and the 15th of October of 2007 with the help of Portuguese e-Commerce Association (ACEPI). Along that period several reminders were sent in order to maximize the number of replies. The message was not received by 11 sites in the list, which were excluded. From the remaining 177, fifty two responses were received, from which 49 were considered valid for analysis purposes.

The second survey was sent by ACEPI between the 28th of June of 2010 and 30th of October of 2010 to 400 Portuguese e-Commerce firms, including 56 members of the Portuguese e-Commerce Association (the remaining 344 companies were identified in their directory as e-Commerce firms). Thirty answers were received, 17 of them from the same companies that had already responded to the 2007 survey.

The final sample that resulted from the conjunction of the two phases totaled 62 e-Commerce firms. It is a cross-industry sample, including firms of different sizes (measured by the number of employees), industry types, business models, and different percentage of online sales. Of the firms of the sample 69% have less than 51 employees, the predominant business model is B2C, and 23% are pure players (i.e. they only sell online).

3.2 Instrument

The research instrument was based on the Dess and Davis model (Dess and Davis, 1984), which was built to determine the applicability of Porter's (1980) generic strategies. The original model contained a set of 21 competitive methods and has been tested in different contexts (Marques, Lisboa *et al.*, 2000), and its reliability and validity – such as its capacity to explain a firm's strategic behaviour – have been corroborated. Some of Dess and Davis' questions were rewritten to include services as well as products, and the variable 'Meeting the delivery date'

TABLE I

Control variables

Number of employees	
< 51	69,4%
> 250	21,0%
51 to 250	9,7%
Industry type	
commerce	59,7%
services	32,3%
banking	6,5%
manufacturing	1,6%
% online sales	
11% to 99%	38,7%
< 11%	33,9%
100%	22,6%
?	4,8%
Business model	
B2C	61,3%
B2B	19,4%
Other	16,1%
?	3,2%

was substituted for the variable 'Forecasting market growth' following Jácome et al. (Jácome, Lisboa *et al.*, 2002). The model was also modified to include the competitive methods derived from the literature review, such as Mata et al. for the resource-based view (Mata, Fuerst *et al.*, 1995), Tripsas for the Schumpeterian innovation (Tripsas, 1997), Gulati et al. for the strategic network theory (Gulati, Nohria *et al.*, 2000), and Robert David and Shin-Kap Han for the transaction cost theory (David and Han, 2004). Moreover, based on the paper of Blasé, Sviokla and Akpakpan, variables that translate the importance of information and technology were introduced.

The first survey consists of 37 questions, corresponding to competitive methods, of seven-point Likert-type scales ranging from less important to most important. The instrument was validated (face validity) by 5 e-Commerce executives during a pilot test, to ensure that the questions were being properly interpreted.

After the first survey exploratory factorial analysis was used to purify the scales measures, excluding individual variables with scores below 0.50 by means of a step by step process, in order to improve the reliability of the measures.

TABLE II

Descriptive Statistics of Competitive Methods (1st phase survey)

Competitive methods	Mean *	SD
1 New product/service development	5,39	1,44
2 Customer service	5,39	1,54
3 Operating efficiency	5,84	1,31
4 Product/service quality control	5,48	1,56
5 Experienced/trained personnel	5,31	1,63
6 Maintaining high inventory levels	2,96	1,65
7 Competence pricing	5,24	1,70
8 Broad range of products	5,65	1,15
9 Developing/refining existing products/services	5,29	1,30
10 Brand identification	5,84	1,25
11 Innovation in marketing techniques and methods	5,55	1,10
12 Control of channels of distribution	4,69	1,82
13 Procurement	3,48	2,02
14 Minimizing use of outside financing	3,34	1,96
15 Serving special geographic markets	3,63	1,78
16 Capability to manufacture/perform specialty products/services	5,27	1,52
17 Products in high price market segments	4,41	1,58
18 Advertising	5,31	1,25
19 Reputation within the industry	5,96	1,15
20 Innovation in manufacturing/service processes	5,20	1,58
21 Meeting the delivery date	5,85	1,46
22 Continuous improving in the production/service process	5,19	1,71
23 Managerial Information technology (IT) skills	5,45	1,42
24 Investment in developing new technologies	5,18	1,56
25 Technical capabilities	5,31	1,42
26 Appropriability through specialized complementary assets	4,72	1,64
27 Exploiting technological advancements to collect, manage and analyse data	4,82	1,59
28 Exploiting technological advancements to reduce costs	5,14	1,38
29 Analyse information for insight and opportunities	5,33	1,11
30 Develop information systems to assess customer needs	5,45	1,23
31 Define products/services based on customer needs	5,67	1,14
32 Develop economies of scale through strategic networks	4,60	1,43
33 Develop economies of scope through strategic networks	4,60	1,31
34 Access to information, markets, technologies through strategic networks	4,96	1,49
35 Outsource some activities	4,28	1,78
36 Low production/service cost	4,80	1,46
37 Improve efficiency by reducing transaction costs	5,00	1,46

* n = 49

3.3 Data analysis

In a first phase, exploratory factor analysis was used to reduce the number of variables of the survey and in a second phase, confirmatory factorial analysis was used to identify the underlying e-Commerce strategy dimensions. To measure

sample adequacy we used Kaiser-Meyer-Olkin (KMO) statistics. The statistical analysis was performed using SPSS 15.0 for Windows, which provides the overall KMO as a single statistic; the KMO values for individual variables are derived from the anti-image correlation matrix. The purification of the scale measures was done by excluding individual variables with scores below 0.50, using a step by step process, in order to check the effects of removing one variable on the sample adequacy. For factorial extraction we used the Principal Components Analysis method, which transforms a set of correlated variables into a set of uncorrelated variables. To select the components three criteria were considered: eigenvalues (account of variance explained by each factor) above 1.0; percentage of variance explained; and interpretation. An orthogonal rotation was performed, using the varimax method proposed by Kaiser and Rice (1974), to make it easier to assign the description of the factors and to make them more interpretable.

Factorial analyses are commonly used to extract dimensions from a set of variables, so it is adequate for the purpose of our research.

4. RESULTS

After the first survey, exploratory factorial analysis was performed and 10 questions were deleted, and during the second phase we fine-tuned the analysis and kept only 12 variables, corresponding to three e-Commerce strategies dimensions. We obtained consistent results with multiple samples. This included the sample of the 1st phase (KMO=0.83 and 76.19% variance explained) and the combination

TABLE III

Descriptive Statistics

	N	Mean	Std. Deviation
Develop economies of scale through strategic networks	60	4,58	1,42
Exploiting technological advancements to collect, manage and analyse data	62	4,92	1,55
Develop economies of scope through strategic networks	59	4,63	1,40
Improve efficiency by reducing transaction costs	61	5,23	1,45
Brand identification	62	5,94	1,19
Innovation in marketing techniques and methods	62	5,68	1,07
Advertising	62	5,47	1,20
Reputation within the industry	62	5,95	1,17
New product/service development	62	5,45	1,31
Experienced/trained personnel	61	5,36	1,49
Develop/refining existing products/services	61	5,43	1,22
Technical capabilities	62	5,37	1,32

of the 1st phase with the 2nd phase. We replaced the answers given by the same companies on the 2007 survey with the 2010 ones (KMO=0,801 and 71.99% variance explained). And we considered the 49 answers of the 1st survey plus 13 answers of the 2nd survey, which corresponds to companies that didn't answer the first one (KMO=0.835 and 72.34% variance explained). The loadings attributed to each competitive method allow us to characterize each dimension.

TABLE IV

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,835
Bartlett's Test of Sphericity	Approx. Chi-Square	404,261
	df	66
	Sig.	,000

TABLE V

Total Variance Explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,933	49,443	49,443	3,070	25,582	25,582
2	1,408	11,731	61,174	2,865	23,873	49,455
3	1,340	11,167	72,342	2,746	22,887	72,342

Extraction Method: Principal Component Analysis.

The descriptive statistics, mean and standard deviation show the relative importance attributed to each competitive method by e-commerce executives. The ones that emerged as the most important are the ones related to marketing, in particular the reputation within the industry and brand identification. Although not included in any of the strategic dimensions we found, there are also some variables that emerged as important that should be highlighted: operational efficiency; meeting the delivery date; managerial IT skills; and customer service.

In order of importance, we obtained a first e-Commerce dimension related to a differentiation strategy via marketing, a second differentiation strategy path focused on product/service innovation, and a third dimension related to a cost leadership strategy.

The first dimension, differentiation via marketing, is anchored on the reputation of the firm within the industry and its brand identification. Innovation in marketing techniques and methods as well as advertising seem to be important.

TABLE VI

Rotated Component Matrix(a)

	Component		
	1	2	3
Innovation in marketing techniques and methods	,856		
Advertising	,804		
Reputation within the industry	,777		
Brand identification	,725		
Develop economies of scale through strategic networks		,808	
Develop economies of scope through strategic networks		,787	
Exploiting technological advancements to collect, manage and analyse data		,760	
Improve efficiency by reducing transaction costs		,737	
New product/service development			,814
Develop/refining existing products/services			,741
Experienced/trained personnel			,740
Technical capabilities			,735

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 5 iterations.

Although the term advertising is used extensively, online advertising should be considered an important means.

The second dimension is related to products and services, focusing on the development of new products or services and in refining existing products and services. It is based on technical capabilities, with the existence of experienced and trained personnel being an important resource.

Finally, the last dimension is focused on efficiency, reducing transaction costs, using strategic networks to obtain economies of scale and scope, and exploiting technological advancements to collect, manage and analyse data.

The marketing dimension could be explained by the market-based view perspective since it corresponds to a differentiation strategy that could enhance the relative position of a firm as advocated by Porter (Porter, 1985). But a firm's reputation and its brand name are strategic assets in a resource-based perspective, building trust and contributing to lock-in, which is one of the value drivers suggested by Amit and Zott (Amit and Zott, 2001), and manifested in switching costs, which are anchored in transaction costs theory (Williamson, 1975). The innovation in marketing techniques and methods is consistent with the Schumpeterian concept of innovation (Schumpeter, 1942) since the characteristics of virtual markets require a different marketing approach in order to reach the customer and understand customer needs. A firm's information

FIGURE 3

E-Commerce strategy dimensions

E-COMMERCE STRATEGY DIMENSION	COMPETITIVE METHODS
1. MARKETING	<ul style="list-style-type: none"> • INNOVATION IN MARKETING TECHNIQUES • ADVERTISING • REPUTATION WITHIN THE INDUSTRY • BRAND IDENTIFICATION
2. PRODUCTS AND SERVICES	<ul style="list-style-type: none"> • NEW PRODUCT/SERVICE DEVELOPMENT • DEVELOP/REFINING EXISTING PRODUCTS • EXPERIENCED/TRAINED PERSONNEL • TECHNICAL CAPABILITIES
3. EFFICIENCY	<ul style="list-style-type: none"> • DEVELOP ECONOMIES OF SCALE THROUGH STRATEGIC NETWORKS • DEVELOP ECONOMIES OF SCOPE THROUGH STRATEGIC NETWORKS • EXPLOITING TECH ADVANCEMENTS TO COLLECT, MANAGE AND ANALYSE DATA • IMPROVE EFFICIENCY BY REDUCING TRANSACTION COSTS

assets and information-processing skills and resources critically affect its ability to pursue certain marketing strategies (Varadarajan and Yadav, 2002), and the firm's dynamic capabilities (Teece, Pisano *et al.*, 1997) that result in the creation of new skills and resources pertaining to the management of information-based assets need careful scrutiny when competing in the electronic marketplace (Varadarajan and Yadav, 2002).

The second dimension, which is related to products and services, is based on the development of new products and services, i.e. innovation in products and services which is an important driver of value creation as suggested by Schumpeter (Schumpeter, 1942), and corresponds to one of the sources of value creation identified by Amit and Zott: novelty (Amit and Zott, 2001). Analysis of the data suggests that to develop this kind of strategy a firm must have experienced and trained personnel and technical capabilities, which is consistent with the resource-based theory (Barney, 1991; Tripsas, 1997), but these variables are also suggested in a market-based perspective as a method of differentiating a firm in a competitive landscape (Porter, 1985).

The third dimension could be inserted in a cost leadership strategy as proposed by Porter (Porter, 1985), and it is anchored on two sources of value creation: efficiency and complementarities (Amit and Zott, 2001). Transaction efficiency is of the greatest importance, which is consistent with the transaction costs economics (Williamson, 1975; Williamson, 1979; Williamson, 1983), and the use of strategic networks to obtain economies of scale and scope are articulated in the network theory as important drivers of value creation, which

highlights the importance of complementarities within a strategic network (Gulati, 1999; Gulati, Nohria *et al.*, 2000). Moreover, an important method associated with this dimension is the exploitation of technological advancements to collect, manage and analyse data, which highlights the importance of technology and information in the context of e-Commerce (Blase, Sviokla *et al.*, 2006).

5. CONCLUSIONS AND IMPLICATIONS

Our analysis has important implications for both researchers and e-Commerce firm managers. For researchers, the results corroborate the need to integrate different theories of value creation in order to better understand how value is created in virtual markets (Amit and Zott, 2001), since they clearly indicate the usefulness of integrating the market-based view (Porter, 1985), the resource-based view (Barney, 1991), the Schumpeterian concept of innovation (Schumpeter, 1942), strategic network theory (Dyer and Singh, 1998), and transaction costs theory (Williamson, 1975) when depicting the strategic orientation of e-Commerce firms in Portugal. Moreover, this research provides a framework for future research.

For e-Commerce firm managers, our paper provides a benchmark for their e-Commerce strategies and highlights the most important competitive methods in the context of virtual markets, identifying the most important strategic dimensions to consider when defining an e-Commerce strategy.

Nevertheless, although the results obtained are significant, the sample size is relatively small, which constitutes a limitation of the research. Moreover, the findings presented herein beckon replication in order to confirm the applicability of this framework in different countries. One possible development of this research should be the definition of strategic groups and the assessment of their e-Commerce strategy performance in order to improve the insight on strategy in the context of virtual markets.

All in all, in spite of virtual markets having specific characteristics, most of the strategic and entrepreneurial theories are still applicable, although they should be considered within an integrated perspective. The research also suggests that e-commerce is seen by the majority of firms as an evolution, which should be combined with their off-line activities, and highlights the strategic role of information and technology in electronic environments.

Finally, three e-Commerce strategy dimensions were identified: differentiation via marketing, differentiation via products and services, and a cost leadership strategy via strategic networks and transaction costs reduction. The three dimensions have a correspondence with the four sources of value creation revealed by Amit and Zott research (Amit and Zott, 2001), lock-in, novelty, efficiency, and complementarities, but our analysis suggests that efficiency and complementarities

are combined in a single dimension. In fact, efficiency gains made possible by IT pave the way for the exploitation of complementarities in virtual markets, and complementarities could lead to increased efficiency; therefore, these two sources of value creation are related, which could justify their inclusion in just one strategic dimension.

Last but not least, the data analysis suggests that a different importance is attributed to the three dimensions. The marketing dimension appears to be the first one, with reputation within the industry and the brand name being the variables that are seen as most important in gaining and sustaining a competitive advantage in e-Commerce; second, a dimension related with product and service development; and in third place the dimension that is linked to efficiency and complementarities. The importance given to differentiation dimensions suggests that e-Commerce firms should have a strategic positioning in order to achieve a competitive advantage, and most of the theories of value creation built for the physical world remain valid. At the end of the day, e-Commerce is just commerce, even though virtual markets have specific characteristics which allow for different combinations of resources, thus boosting innovation and creating new opportunities.

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