

Faculty of Economics of the University of Porto
Master in Management Sciences
Major in Marketing

**AN INTERORGANIZATIONAL PERSPECTIVE OF
E-MARKETPLACES:
THE CASE OF ECONSTROI.COM**

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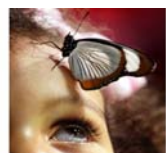
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To a Special Moment in My Life



Biographical Note

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I would like to end by saying that I am fortunate for all of you entering my life, because “The journey you walk does not count. It is with whom you walk that makes the difference.”

Alina Petrescu

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Abstract

Construction is a highly complex exercise of coordination, cooperation and communication, due to the great number of different activities and disciplines that have to be performed. Up to now, it was an activity mainly based on paper, redundant work, with lots of delays and costs which generate inefficient communication between business partners.

The introduction and use of the Internet in the construction setting, impacted on the business-to-business interactions and relationships, offering new ways for collaborating across organizational boundaries. It enabled the establishment of an alternative channel for marketing and selling products, serving as a platform to set up e-marketplaces. Buyers and sellers are now able to innovate and reengineer their entire business processes and practices, from procurement, production to customer service.

This research tries to address the implications of the Internet use, by presenting how the current construction business process has been modified through the use of a new and innovative e-marketplace. Construction companies are currently able to cut costs of unproductive and bureaucratic activities and improve information flows in and out of the company as well as discover new ways of interacting and collaborating. Within this setting, there is a question that has to be answered: Up to what point, the use of an e-marketplace is a win-win situation for both buyers and suppliers?

The various benefits from e-marketplace participation are studied at three levels of analysis: company level, buyer-supplier relationship level and industry level.

In short, the empirical results supported a positive impact of a B2B e-marketplace on business processes and buyer-supplier relationship. These can work as premises for the development of new business practices in an integrated and connected industry.

Keywords: buyer-supplier relationship, collaboration, construction industry, e-business, e-commerce, e-marketplace, networks, collective action.

Resumo

A indústria da construção envolve um grau extremamente complexo de coordenação, cooperação e comunicação, dado o elevado número de actividades e disciplinas que devem ser realizadas. Até muito recentemente era uma actividade baseada em papel, trabalho redundante, atrasos e custos, o que resultava numa comunicação ineficiente entre parceiros de negócios.

A introdução e o uso da Internet no sector da construção teve um grande impacto nas interacções e relações B2B, criando novas formas de colaboração que atravessam as fronteiras organizacionais. Permitiu o estabelecimento de um canal alternativo para o marketing e venda de produtos, servindo como plataforma para o estabelecimento de mercados electrónicos. Compradores e vendedores têm agora a possibilidade de inovar e reorganizar todos os seus processos e práticas de negócio, desde a aquisição de produtos e bens ao serviço ao cliente.

A presente pesquisa pretende abordar todas as implicações do uso da Internet, baseando-se no impacto registrado no modelo de negócio corrente no sector da construção, pela utilização de um moderno e inovador mercado electrónico. Empresas de construção podem presentemente reduzir os custos de actividades burocráticas e improdutivas, melhorar o fluxo de informação dentro e fora da empresa, e descobrir novas formas de interagir e colaborar. Neste enquadramento há uma questão que deve ser respondida: até que ponto a utilização de um mercado electrónico é uma situação vantajosa para as duas partes envolvidas: compradores e fornecedores?

Os vários benefícios da participação num mercado electrónico são estudados a três níveis de análise: ao nível da empresa, da relação comprador-fornecedor e ao nível da indústria.

Resumindo, os resultados empíricos apoiaram a ideia do impacto positivo do e-marketplace nos processos de negócio e nas relações comprador-fornecedor. Estas podem funcionar como pressupostos para o desenvolvimento de novas práticas de negócio numa indústria integrada e interligada.

Palavras-chave: relação comprador-fornecedor, colaboração, indústria da construção, e-business, e-commerce, e-marketplace, redes, acção colectiva.

Table Of Contents

BIOGRAPHICAL NOTE	III
ACKNOWLEDGMENTS	V
ABSTRACT.....	VII
RESUMO.....	IX
TABLE OF CONTENTS	XI
LIST OF FIGURES	XIV
LIST OF TABLES	XVI
LIST OF ABBREVIATIONS.....	XVII
INTRODUCTION	1
I. PROBLEM AREA OF THE STUDY	1
II. STATEMENT OF PROBLEM.....	2
III. RESEARCH OBJECTIVES AND QUESTIONS	4
IV. STRUCTURE OF THE STUDY	4
PART ONE – THEORETICAL BACKGROUND	7
CHAPTER 1: THE NEW INTERNET ECONOMY.....	7
1.1. IN SEARCH OF A DEFINITION OF THE NEW INTERNET ECONOMY.....	7
1.2. E-BUSINESS VERSUS E-COMMERCE.....	10
1.3. THE IMPORTANCE OF E-COMMERCE.....	11
1.3.1. Growth	12
1.3.2. Categorization.....	13
1.4. E-MARKETPLACES	15
1.4.1. Definition Of E-Marketplaces.....	16
1.4.2. Roles Of E-Marketplaces	17
1.4.3. Characteristics Of E -Marketplaces.....	17
1.4.4. Business Dimensions Of E-Marketplaces	19
1.5. E-MARKETPLACE BENEFITS	25
1.6. FINAL REMARKS	29
CHAPTER 2: UNDERSTANDING THE PROCUREMENT PROCESS	31
2.1. NEW TRENDS IN PROCUREMENT	32
2.2. PURCHASE SITUATION DIMENSIONS.....	34
2.3. PROCUREMENT OBJECTIVES AND DECISION MAKING PROCESS.....	40
2.4. SUPPLY CHAINS	42

2.5. INTERNET-BASED PROCUREMENT SYSTEMS AND B2B ELECTRONIC MARKETS	44
2.6. FINAL REMARKS	46
CHAPTER 3: B2B INTERACTION USING INFORMATION AND COMMUNICATION TECHNOLOGY	47
3.1. GENERAL OVERVIEW OF THE CONCEPTUAL BACKGROUND	47
3.2. INTERACTION AND NETWORK MODELS	49
3.2.1. <i>Buyer – Supplier Interaction Model</i>	50
3.2.2. <i>Industrial Network Model</i>	57
3.2.3. <i>Collaborative Networks – The Collective Action Perspective</i>	62
3.3. THE STRATEGIC IMPACT OF THE INTERNET	65
3.4. E-BUSINESS IN A DYADIC PERSPECTIVE	69
3.5. THE NOTION OF “CO-OPETITION” AND E-BUSINESS SUCCESS	75
3.6. FINAL REMARKS	78
PART TWO – RESEARCH DESIGN	79
CHAPTER 4: CONCEPTUALISATION AND FRAMEWORK FOR ANALYSIS	79
4.1. CONCEPTUALISATION AND OPERATIONALISATION	79
4.2. RESEARCH QUESTIONS	84
4.3. DIMENSIONS OF ANALYSIS	87
4.4. EMERGED FRAME OF REFERENCE	91
4.5. FINAL REMARKS	91
CHAPTER 5: RESEARCH METHODOLOGY	93
5.1. THE RESEARCH PROJECT	93
5.1.1. <i>Research Objectives</i>	93
5.1.2. <i>Content And Context Of The Research Project</i>	95
5.1.3. <i>Constraints</i>	97
5.2. RESEARCH APPROACH	98
5.3. RESEARCH STRATEGY	99
5.3.1. <i>Case Selection</i>	100
5.3.2. <i>Data Collection</i>	101
5.3.3. <i>Methods Of Analysis</i>	105
5.4. FINAL REMARKS	106
PART THREE – EMPIRICAL INVESTIGATION	107
CHAPTER 6: OVERVIEW OF THE CONSTRUCTION INDUSTRY IN PORTUGAL	107
6.1. CONSTRUCTION INDUSTRY IN PORTUGAL	107
6.2. PROCUREMENT PROCESS	110
6.3. APPLICABILITY OF E-COMMERCE	112

6.4. CURRENT PENETRATION OF IT	114
6.5. FINAL REMARKS	115
CHAPTER 7: E-MARKETPLACE SOLUTION FOR THE CONSTRUCTION INDUSTRY: ECONSTROI.COM.....	117
7.1. THE COMPANY BEHIND ECONSTROI.COM	117
7.2. COMPANY’S MISSION AND VALUES.....	120
7.3. CHARACTERISTICS AND FUNCTIONALITY METHOD	121
7.4. PRODUCTS AND SERVICES	124
7.5. THE TARGET	126
7.6. ECONSTROI.COM VALUE PROPOSITION: CONNECTING BUSINESS!	127
7.7. FINAL REMARKS	127
CHAPTER 8: CASE STUDY ANALYSIS: THE CHANGE IN THE PORTUGUESE CONSTRUCTION INDUSTRY DRIVEN BY ECONSTROI.COM	129
8.1. ECONSTROI.COM E-MARKETPLACE - COMPANY LEVEL IMPACT	130
8.1.1. <i>Process Improvements</i>	130
8.1.2. <i>Cost Reductions</i>	136
8.1.3. <i>New Business Opportunities</i>	142
8.1.4. <i>Attitudes And Views</i>	146
8.2. ECONSTROI.COM E-MARKETPLACE - RELATIONSHIP LEVEL IMPACT.....	151
8.3.1. <i>Relationship Success Within Econstroï.Com Context</i>	152
8.3.2. <i>The Atmosphere</i>	158
8.3. ECONSTROI.COM E-MARKETPLACE - INDUSTRY LEVEL IMPACT	167
8.3.1. <i>From E-Commerce To E-Construction In Portugal</i>	167
8.3.2. <i>Envision Of The Econstroï.Com Network</i>	171
8.3.3. <i>Collective Action Dynamics</i>	185
8.4. FINAL REMARKS	189
CHAPTER 9: CONCLUSION.....	191
9.1. RESEARCH FINDINGS.....	191
9.2. CONTRIBUTIONS.....	199
9.3. LIMITATIONS OF THE STUDY	200
9.4. FUTURE RESEARCH	201
9.5. CONCLUDING REMARK	202
REFERENCES	203
APPENDICES.....	217

List Of Figures

Figure 1: The scope of e-commerce, e-business and e-economy.....	9
Figure 2: The e-marketplace as an electronic intermediary between suppliers and customers.....	18
Figure 3: Seller-driven and buyer driven auctions.....	21
Figure 4: Services provided by Electronic B2B marketplaces	25
Figure 5: E-marketplace benefits	26
Figure 6: ABC analysis adapted for construction industry	35
Figure 7: Types of Relationships.....	39
Figure 8: Buyer Supplier Interaction Model	52
Figure 9: The A-R-A model of industrial networks – adapted.....	59
Figure 10: The three dimensional model of industrial networks.....	65
Figure 11: The customer Pyramid.....	71
Figure 12: The Purchasing Portofolio	73
Figure 13: CO-OPETITION: A blurred line between competition and cooperation	77
Figure 14: Dispersion of E-Marketplace effects	85
Figure 15: Framework for Analysis	86
Figure 16: E-marketplace benefits	88
Figure 17: Relationship Success generated by an e-marketplace	89
Figure 18: The three dimensional model of industrial networks.....	90
Figure 19: Emerged frame of reference: impact of econstroï.com in the construction industry.....	91
Figure 20: Illustration of the empirical material gathered for the study.....	102
Figure 21: Origins of Gross Domestic Product in 2004	108
Figure 22: Spider web communication network.....	110
Figure 23: Steps of the purchasing process in the construction industry.....	111
Figure 24: Common platform for communication.....	112
Figure 25: Forecast of the evolution of B2B e-commerce as a percentage of GDP in Portugal	115
Figure 26: Vortal's Business Offer.....	118
Figure 27: Vortal's shareholders	119
Figure 28: Vortal's Values.....	121
Figure 29: Econstroï.com – central entity between buyers and suppliers.....	122
Figure 30: Business Dimensions of econstroï.com.....	122
Figure 31: Steps in launching a request for proposal	123

<i>Figure 32: Econstroi.com: succession of services according to the transaction phase.....</i>	<i>125</i>
<i>Figure 33: Target companies.....</i>	<i>126</i>
<i>Figure 34: Emerged frame of reference</i>	<i>129</i>
<i>Figure 35: E-marketplace benefits</i>	<i>130</i>
<i>Figure 36: Econstroi.com – universe of market players.....</i>	<i>133</i>
<i>Figure 37: Buyer/supplier one-to-one relationship</i>	<i>134</i>
<i>Figure 38: Representation of RFPs, Proposals and Adjudications per category in econstroi.com</i>	<i>139</i>
<i>Figure 39: Buyer’s savings from using econstroi.com</i>	<i>141</i>
<i>Figure 40: Summarization of the related benefits from using econstroi.com by firms in the construction industry</i>	<i>145</i>
<i>Figure 41: Relationship success– econstroi.com effects.....</i>	<i>152</i>
<i>Figure 42: Traditional process in construction industry.....</i>	<i>158</i>
<i>Figure 43: IMR Inquiry - econstroi.com satisfaction and recommendation levels.....</i>	<i>170</i>
<i>Figure 44: Transaction volume of the most relevant Portuguese e-commerce platforms (millions €).....</i>	<i>171</i>
<i>Figure 45: Econstroi.com network</i>	<i>172</i>
<i>Figure 46: The scope of econstroi.com’s services: Commerce, Collaboration and Content.....</i>	<i>186</i>
<i>Figure 47: Econstroi.com collaborative network.....</i>	<i>188</i>

List Of Tables

Table 1: E-commerce revenues in Europe 2000-2004 (total amount and B2B revenues).....	12
Table 2: E-commerce and broader Internet Applications	13
Table 3: Marketplace types: public and private	23
Table 4: E-procurement goals and examples	75
Table 5: Thesis' Research Questions.....	86
Table 6: Dimensions of Analysis	87
Table 7: Steps that were taken in case selection.....	101
Table 8: Main Construction Companies.....	109
Table 9: Purchasing process in construction: asset specificity and effects of Internet-based applications	111
Table 10: Evolution of B2B e-commerce as a percentage of GDP in Portugal	115
Table 11: Econstroi.com in numbers.....	120
Table 12: Econstroi.com products and services: buy side and sell side.....	124
Table 13: Econstroi.com Requirements, Costs and Benefits	138
Table 14: Number of RFPs, Proposals Received, Adjudications and Value of Adjudications per category in econstroi.com.....	139
Table 15: Strategic Sourcing Saving Potential.....	142
Table 16: Price reduction (%) due to econstroi.com utilization.....	148
Table 17: Savings achieved due to econstroi.com utilisation.	148
Table 18: Workshops Mota Engil – Econstroi.com	149
Table 19: Gondepac Lda econstroi.com utilisation report.....	151
Table 20: Econstroi.com impact on its 3.000 customers	168
Table 21: Support resources category statistics from the 1 st of Jan. of 2005 to the 31 st of Aug. of 2006	174
Table 22: Products, services and equipment categories statistics from the 1 st of Jan. of 2005 to the 31 st of Aug. of 2006.....	175
Table 23: Synthesis – Company Level Findings	193
Table 24: Synthesis – Buyer Supplier Relationship Level Findings	195
Table 25: Synthesis – Construction Industry Level Findings	198

List Of Abbreviations

B2B	Business to Business (Marketing)
B2C	Business to Consumer (Marketing)
B2A	Business to Administration (Marketing)
ICT	Information and Communication Technology
IMR	Institute for Marketing Research
IMP	Industrial Marketing and Purchasing Group
OECD	Organisation for Economic Cooperation and Development
RFP	Request for Proposal
RFQ	Request for Quotation

Introduction

*“The way to get started is to quit
talking and begin doing.”
(Walt Disney)*



I. Problem Area Of The Study

Due to the rapid growth of Internet technologies and applications, new possibilities in the construction industry have been envisioned through enhanced communication, collaboration and coordination. The majority of companies in the multi billion euros construction industry are expected to move towards e-business to a greater extent. In today's business environment, this is a condition for increasing the effectiveness of the business processes. A new and innovative project envisioned by econstrois.com has taken on the task of leading the Portuguese construction companies towards a new way of doing business.

Today's society is characterized by speed, complexity, and high information content. As a result, the strategic focus of most businesses acting in industrial markets is in constant transformation and adaptation to the new realities. As technology and automation of business processes take care of routine and labour-intensive tasks, information and know-how become the basis for competitive advantage. Increasingly, business is about working with the right partners, being able to create the right relationship networks that bring most benefits for the business partners.

The rapid development of information technology creates vast possibilities to reconstruct and improve common business processes within and between companies. A major shift in communication between business organizations is taking place, which is actually redefining organizations and commercial transactions.

For a long time, companies have restructured and reengineered business processes to increase organisational effectiveness. The new business environment puts pressure on

companies to look beyond their organizational boundaries. As a result, the centre of attention has turned from an intra-enterprise focus towards an inter-enterprise focus and how collaborative trading partners can manage trading processes better. Working closely with strategic suppliers or customers can improve organization's performance.

At a first glance, it seems self evident that e-commerce refers to doing business online and electronically. If we extract the "e" from e-commerce it points directly to the foundation of the concept. Nonetheless, the term is not merely the migration of certain business functions from "offline" to online platforms: it represents the means to transform industries and introduce new ways of doing business. E-commerce is bringing us into a new era for doing business by creating an environment for new behavioural patterns and needs.

The market for business-to-business e-commerce is massive, is expanding at a phenomenal rate and is expected to grow even more in the future. Several organizations expect e-marketplaces to be the catalyst of this new business era.

II. Statement Of Problem

The construction industry is one of the most important sectors regarding its function for the whole economy and society. In the same time construction world is in front of a major shift in business practices, facing the challenges to enhance current work practices and become more effective.

Since the construction industry is largely based on sharing information and collaboration between the participants in a construction project, then Internet applications can impact greatly on the construction industry. The Internet increases the transparency of the construction market, it enables virtualization of organizational networks, increasing the business opportunities and reducing costs.

These information-intensive industries like construction are fertile ground for e-commerce. The application of e-commerce in the Portuguese industries faces an initial stage. The Internet usage is expanding and more and more companies are present on the World Wide Web.

According to the E-business Report (2007), the use of ICT among Portuguese companies is quite high when considering the use of computers (91%, but almost 100% in companies employing over 50 staff), e-mail and Internet access (82%, but 100% among large companies). In the same time, e-business in Portugal has been performing rather well. According to the data supplied by the e-business Association (ACEP), in the first half of 2006, 80% of Portuguese e-business websites reported that their turnover grew, and for some 20% of those the growth was over 50%.

According to the same institute, Portugal is fully committed in implementing and disseminating the usage of ICT and e-business. This initiative was concretised at the end of 2005 with the launching of the Technological Plan, whose objective aims at mobilizing the Portuguese society to overcome the modernization challenge that the country has been facing in the last years. This plan is based on: qualifying the Portuguese for the Knowledge and Information Society, fostering structural measures to enhance the average qualification level of the population, to overcome the scientific and technological gap and to boost innovation by means of the diffusion and development of new procedures, organizational systems, services and goods.

Within this context, the success of B2B e-marketplaces can be and is being applied to the construction industry. The econstroi.com project undertakes the role of providing the technological platform for e-marketplaces and takes on an active role in bringing buyers and sellers together by providing relevant content, connectivity and value-added services.

The present thesis aims at understanding the impact and dynamics of e-marketplaces from an interorganizational perspective. It addresses this objective in the context of the Portuguese construction industry by presenting how current business practices are being affected by the use of new and innovative e-commerce applications.

III. Research Objectives And Questions

The main question of the study “what is the impact and dynamics of e-marketplaces?” gives rise to two operational research questions presented below:

- ❖ How and why do companies interact using the e-marketplace arena?
- ❖ How can one best describe and analyse the effects of an e-marketplace in terms of benefits (value creation) for the participant members?

This research will be conducted so as to provide a full consideration of the development of e-commerce in the construction industry. Specifically, the study aims to:

- ❖ Provide an understanding of Portuguese construction industry and develop an understanding of the current situation, in order to explore to what extent the industry has embraced e-commerce, where and how it is being used.
- ❖ Examine current practices to ascertain the industry’s view with regard to e-commerce and what the priorities in this area are.
- ❖ Identify the benefits brought by e-commerce for individual companies, buyer supplier relationship and industry as a whole.

Hence, this research studies the current situation of the Portuguese construction industry and determines the opportunities and inhibitors brought by an e-marketplace for all the participants in a construction project. The impact of econstroi.com project will be presented by the change in the procurement process. These changes led to important transformations in the way in which companies interact and conduct business processes, as well as cost reductions and improvements in productivity levels.

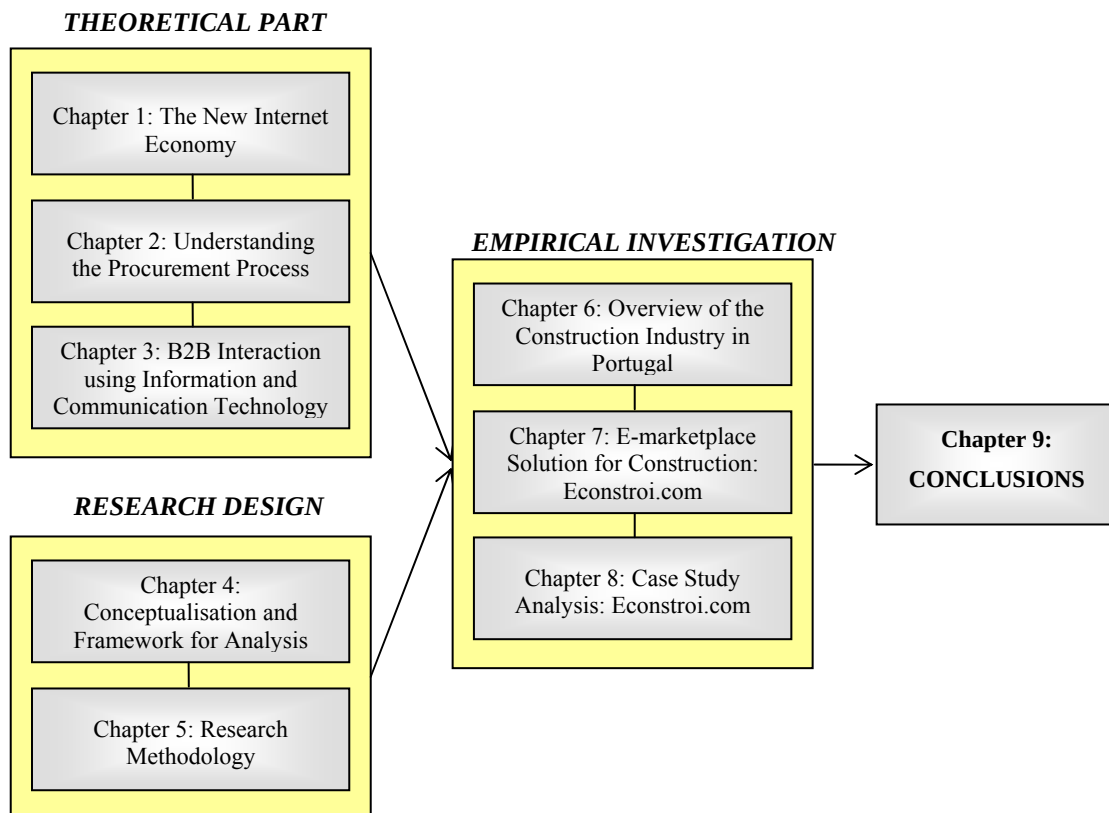
IV. Structure Of The Study

The scope of the present study can be described through the following characteristics:

- ⤴ Research phenomenon: E-marketplace impact and dynamics.

- ▲ Theoretical basis: e-marketplaces, procurement strategy, industrial marketing and purchasing literature concerning the concepts of buyer-supplier relationship, procurement process, networks and collective action with an emphasis on the IMP literature.
- ▲ Empirical context: The construction industry specifically studied in the context of an e-marketplace.

The figure below provides an illustration of the direction of the study:



Part One – Theoretical Background

Chapter 1: The New Internet Economy

*“The strategic use of technology will
become a key differentiator among firms.”
(Kogan, 1998).*



The Internet makes available a transparent means of communication between suppliers and buyers. Many firms have concentrated and are concentrating on obtaining market advantage by adopting the new solutions offered by the Internet.

This first chapter is going to focus on presenting the new realities of a dynamic and complex environment, which demands new skills and offers new potential as well as business opportunities. The result of this new reality can be seen in the fundamental transformation of the way in which business processes are conducted and how companies interact. This chapter is composed of seven sections. The first one (section 1.1), makes a short presentation of the New Internet Economy and its major trends. The second section (1.2.) distinguishes between the notions of e-business and e-commerce; afterwards, the notion of e-commerce is presented in the third section (1.3). In the fourth section, the notion of e-marketplace, one of the most important tools of e-commerce is presented: definition, roles, characteristics and business dimensions. The last section, introduces the benefits that e-marketplaces provide for companies (1.5).

1.1. In Search Of A Definition Of The New Internet Economy

The new economy is the result of the information revolution, of even more powerful computers, yet smaller in dimension, intelligent software, and the emergence of an efficient, widely available and invisible communication infrastructure.

One of the most widespread words we hear nowadays is “virtual”. Virtual can represent a new reality in a networked environment where everything is connected. The advantage of network space is its unlimited capacity to accommodate connections and relationships.

The year 1993 can be regarded as the moment when the Internet economy was born with the breakthrough of the World Wide Web. Since that time, the Internet has developed into a service integrated global network with a diversity of multimedia uses (Picot et al. 2000).

The Internet is a network and each connection in the network represents the possibility of a relationship. An organisation using the Internet to conduct its business processes is connected with other organisations in their business processes. The emergence of the Internet and related technologies has led to new ways of interacting between individuals as well as organisations.

In the new Information Economy, the focus for organisational performance moves beyond mere "efficiency". Companies tend to rely increasingly on intangible assets like information, knowledge, relationships, brands and the potential for innovation. In a digital economy, value is created through the opportunities that lie in the potential for relationships. The Information Economy is creating unforeseen opportunities as well as challenges. It is characterised by four distinctive attributes (Liikanen, 2001):

- It is global,
- It is founded on digital technologies,
- It favours intangible things - ideas, information, knowledge, relationships, and
- It is intensely inter-linked.

The Internet economy can be described as follows:

- a. The term “Internet economy” emphasizes the networking of economic actors and processes by means of electronic communication media and the related change in structures of value creation, mechanisms of market function, professional life, and consumption patterns. (Venkatram and Henderson, 1998).

- b. The notion of “Internet economy” comprises both micro and macro perspectives and covers the whole range of economic transactions (profit oriented or not).

Electronic business (e-business) and electronic commerce (e-commerce) are application forms of the Internet economy and are going to be presented further in the next section. In the economic literature, e-commerce is understood as part of e-business (see figure 1). As a result of this major process of transformation or evolution, the companies who want to survive must develop their strategies in order to take advantage of the digitalisation of the new economy.

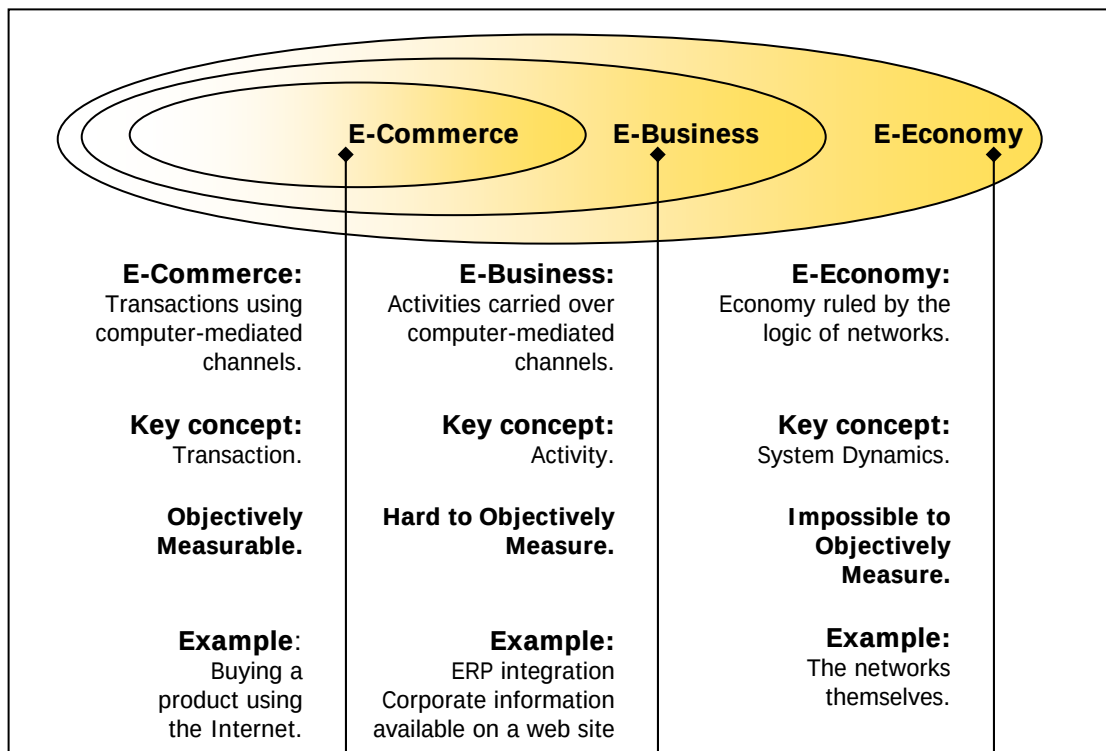


Figure 1: The scope of e-commerce, e-business and e-economy.

(Source: Statistics Canada, E-commerce definition, 1999)

It is not the strongest of the species that survives, or the most intelligent, but the one most responsive to change (Charles Darwin). According to Darwin’s theory, very few companies or sectors remain unaffected by the Internet and the new ways of doing business electronically. In order to survive every company must adapt and reinvent itself to the realities of the new economy. This implies accepting the challenge of the new information and communication technology and going for success.

1.2. E-Business Versus E-Commerce

E-business can be expressed as the new business logic that operates in a world without boundaries. It refers to a broader definition of e-commerce, not just buying and selling but also servicing customers, providing an integrated business environment and offering value added services (Turban and Chung, 1999).

Conducting e-business is not simply about the adoption of new technologies. It involves changes in work practices, in customer/supplier relationships, in the way products are delivered to consumers, in marketing practices and changes in staff skills needed to support e-business. As a result, e-business models create new opportunities for re-organizing the way businesses are currently managed.

In the academic literature, there are many attempts to defining e-business and e-commerce and the delimitation between the two concepts isn't very clear. Some scientific papers present only some features of e-business such as: e-catalogues and price lists (Baron, Shaw et al., 2000) or procurement (Cox, 2001) and therefore do not portrait a complete picture of the term. Other papers define e-business in very specific contexts such as the concept of supply chain integration (Lee & Whang, 2001). A paper on e-commerce defines the concept as "business activities conducted over the Internet" (Zhu & Kraemer, 2002). Turban (2002) gives the following definitions of e-business and e-commerce:

- *E-commerce* is an emerging concept that describes the process of buying, selling, or exchanging products, services and information via computer networks, including the Internet.
- *E-business* refers to a broader definition of E-commerce, not just the buying and selling of goods and services, but also servicing customers, collaborating with business partners, and conducting electronic transactions within an organization.

By summarizing the definitions above and trying to present a general definition that distinguishes the boundaries between e-commerce and e-business, it can be said that:

- E-commerce can be defined using the concept of trade and is a subset of e-business. It can be described as the whole of transactions conducted between companies, using Information and Communication Technology (ICT) to place the orders electronically. It includes e-sales and e-procurement.
- E-business is a broader concept that goes beyond trade and includes other business processes as well. E-business is defined as business of which a part of the process is done using ICT. From this perspective, e-business does not only include transactions but also collaborative activities and other interactions. Where e-commerce is limited to online transactions and procurement, e-business is not.

The two concepts are very much interconnected one to another and cannot be made a profound delimitation between them. The use of e-commerce generated all the important benefits associated with e-business, going beyond the concept of merely trade. As a result, the two concepts will be used throughout the thesis.

Two important concepts related to the processes involved in e-commerce and e-business are transactions and respectively interactions (Graaf and Muurling, 2003). A transaction can be defined as a special kind of interaction, specifically structured communication that leads to the transfer of information/goods/services between two or more entities. Transactions are a subset of interactions. Interactions can be defined as activities and can lead to collaborations, servicing customers, Research & Development activities or knowledge management and sharing.

The next section is going to present in more detail the notion of e-commerce and its importance for business relationships.

1.3. The Importance Of E-Commerce

This sub-chapter highlights the extent of electronic commerce, and exposes the importance of the business-to-business market. The evolution and growth of e-commerce is presented and the concepts and types of e-commerce are categorized in order to present a clearer picture of the term and its implications.

1.3.1. Growth

The general breakthrough of the Internet starting with the year 1990, gave birth to a new paradigm for the business world. For each company, the journey towards the use of the Internet is represented by profound and fundamental changes in the way business processes are performed. Seen as a global network, the Internet associates the advantage of being universal to reducing access, procurement and administrative costs, facility of use, flexibility, interactivity and real time response.

E-commerce is expanding at a phenomenal rate. This is particularly true in the B2B sector (Baron et al., 2000). It is actually growing by leaps and the number of people and companies buying online has trebled since 2001. In the beginning of e-commerce over the Internet, the press and market researchers were primarily focusing on the business-to-consumer (B2C) side, but that has definitively changed now when the business-to-business (B2B) market has taken preponderance over today's electronic commerce.

The table below shows the e-commerce revenues in Europe between the years 2000 and 2004 as presented by Forrester Research (2004). As we can easily see, in the total amount of revenues, the B2B revenues represent more than 70% every year and present a growing trend. In 2004, B2B e-commerce revenues represented 81% of the total amount of revenues. According to the critics, the actual value of the B2B market has overcome the expectations.

E-Commerce Revenues in Europe, 2000-2004 (in billions)	B2B E-Commerce Revenues in Europe, 2000-2004 (in billions)
2000 \$34.30	2000 \$26.24
2001 \$68.89	2001 \$52.42
2002 \$169.81	2002 \$132.74
2003 \$415.97	2003 \$334.14
2004 \$979.83	2004 \$797.29

Table 1: E-commerce revenues in Europe 2000-2004 (total amount and B2B revenues)

(Source: Forrester Research, 2004)

As a result of this continuous development numerous studies are evaluating the impact of ICT and e-business practices on economic growth, industry growth and business performance.

This thesis will evaluate the dynamics and impact of e-marketplaces, by applying this frame to the construction industry in Portugal at different levels of analysis and from different perspectives.

1.3.2. Categorization

E-commerce can be divided into more categories, according to who is selling to whom. The main interest has generally been represented by Business-to-Consumer (B2C) and Business-to-Business (B2B). However, there is also government (administration) to business, government to consumer and vice versa, as well as consumer to consumer and consumer to business. As is clear from their names, B2B is a business selling to other businesses while B2C is a business selling to consumers and B2A is business selling to administrations and so on.

	GOVERNMENT	BUSINESS	CONSUMER
GOVERNMENT	G2G Coordination	G2B Information	G2C Information
BUSINESS	B2G Procurement	B2B E-commerce	B2C E-commerce
CONSUMER	C2G Tax Compliance	C2B Price Comparison	C2C Auction Markets

Table 2: E-commerce and broader Internet Applications

(Source: OECD)

A. Business-to-Consumer

B2C e-commerce focuses on the consumer as end user. It widens a business's potential market and has the potential to provide convenience to consumers, particularly those not near shopping centres. Consumers obtain more and better information about products through electronically publishing, and can purchase products with electronic cash or other secure payment systems.

B. Business-to-Business

Because it is an evolving and far reaching concept, the term B2B is complex to define. Roskill (2000) illustrates it as a multifaceted and fast evolving set of activities carried electronically inside companies and between companies. It exploits Internet technologies to re-engineer processes along the organization's value chain in order to lower costs, improve efficiency and productivity, shorten lead times, and provide better customer services. As illustrated in the tables above (table 1), B2B is the heart of the electronic market in revenue terms, with more than 80% of total e-commerce activities. It is the fastest growing and most rapidly evolving area of e-commerce. The focus of this thesis will be represented by B2B e-commerce and for this reason, the understanding of the B2B uprising is crucial.

The evolution of B2B e-commerce can be depicted from “basic” e-commerce – with focus on reducing costs, improving productivity, and on trading tangibles – to “full” e-commerce – centred on maximising value, creative and proactive strategies and adding value through services and relationships.

B2B e-commerce presents some important characteristics (Roskill, 2000; McIvor et al., 2000):

- Influences the company as well as market structure with an effect on the competitiveness of individual firms and of entire sectors of the economy.
- It is not about selling on the web, it's about creating better communication methods both internally amongst employees and outside with buyers or suppliers.
- It is changing the traditional patterns of the business behaviour by creating a new business culture.

Of course, the development of B2B does not mean the disappearance of “traditional” commerce, but the completion of the traditional commerce with the advantages brought by e-tools. The only certainty is that the pace of change will continue to accelerate and all firms will have at some point to take this into consideration. The key phenomenon, however, is the reorganisation of traditional value chains into much more flexible business

networks. Competitiveness of a company does not only depend on the efficiency of internal processes, but on the depth and breadth of its network of partners – suppliers, customers, consultants, government agencies, etc. Empowered by the Internet, B2B is first and foremost about structural changes – about reinventing companies and marketplaces.

Among the fastest growing phenomenon of B2B e-commerce are electronic marketplaces. E-marketplaces establish communities of buyers and sellers, as well as mechanisms that allow business to participate cost effectively in national and global markets. The concept of e-marketplace will be thoroughly detailed in a subsequent sub-chapter.

C. Business-to-Administration

A third category of e-commerce is business-to-administration (B2A), defined as commerce between companies and the public sector. It refers to the use of the Internet for public procurement, licensing procedures, and other government-related operations. Some of the B2A applications (also known as e-Government) are: submission of planning applications, VAT returns, income tax or patent registration. They have the potential to bring even more companies into the world of electronic trading. Web-based purchasing policies increase the transparency of the procurement process (and reduce the risk of irregularities). To date, however, the size of the B2A e-commerce market as a component of total e-commerce is insignificant, as government e-procurement systems remain undeveloped.

1.4. E-Marketplaces

Electronic marketplaces (e-marketplaces) have been, and still are, a hot issue in B2B environments. Commercial transactions between suppliers and buyers have taken place forever, but now we are in front of a significant transformation of the marketplace. This is because exchanges between firms are increasingly being facilitated through electronic commerce (Strader & Shaw 2000). A growing number of companies are starting to take advantage of the benefits of buying goods or services online using e-marketplaces. For this reason, they are becoming increasingly important for the organisation of procurement and sales activities (Zank and Vokurka, 2003).

B2B e-commerce has the potential to globally promote commercial transactions, helping companies to gain access to new markets, find new business partners and increase their efficiency and productivity. The deployment of B2B e-marketplaces is enabling a more efficient and smoother flow of information, goods, services and payments between businesses. By facilitating transactions and improving business processes, these virtual markets offer a realistic value proposition to business customers.

This sub-chapter is aiming at dissolving some of the confusion around B2B e-marketplaces and describing the electronic marketplace phenomena, its dimensions and architecture, and its characteristics for success.

1.4.1. Definition Of E-Marketplaces

An e-marketplace can be described as a B2B Internet platform providing an Internet-based solution that aims at facilitating new trading relationships between companies, or supporting existing ones. E-marketplaces can represent a more efficient and less expensive way to sell products or provide services globally, without geographical barriers. It reshapes the buyer-seller relationships, improves business processes and helps reach new markets or segments through the electronic medium (McIvor et al., 2000).

B2B e-marketplaces are very interesting and important to study because of their potential to affect company and supply chain performance and to alter industry structure. They are practically changing the way companies do business worldwide, especially with regard to the buyer-supplier relationship. The concept of B2B e-marketplaces has undergone fundamental transformations during recent years.

The Internet technology has enabled companies to create a new market space that facilitates information exchanges and electronic interactions among multiple buyers and sellers (Bakos, 1991; Choudhury, Hartzel, & Konsynski, 1998). At a basic level, Bakos in 1991 defined an e-marketplace as “an interorganizational information system which allows the participating buyers and suppliers to exchange information about prices and product offerings”. In a whitepaper published by IBM, i2, and Ariba (2000), an e-marketplace is

defined as a many-to-many, web-based trading and collaboration solution that enables companies to buy, sell, and collaborate more efficiently on a global scale.

An e-marketplace brings market players together to perform real-time exchange transactions, such as price and product specifications, and supply chain collaboration. One of the most important purposes is to simplify complex business processes and gain efficiencies. The main idea is to aggregate buyers and sellers in a single contact point, allowing participant organizations to enjoy greater economies of scale and liquidity; and to buy or sell anything easily, quickly and cost effectively. E-marketplaces also enable companies to eliminate geographical barriers, and expand globally to obtain profits in new markets that were once out of reach.

1.4.2. Roles Of E-Marketplaces

Bakos (1998) showed that e-marketplaces, on the basis of ITC, perform functions of real world marketplaces, which consist of matching buyers and sellers, facilitation of transactions, and institutional infrastructure. The outcome of e-marketplaces can be presented as more efficient markets, with increased effectiveness and reduced transaction costs. Bailey and Bakos (1997) suggested evidence of emerging roles for e-marketplaces, including aggregating, matching suppliers and buyers, providing trust, and providing interorganizational market information.

Choudhury et al. (1998) argued that an electronic market is an interorganizational information system through which multiple buyers and sellers interact to accomplish one or more of the following market-making activities:

1. Identifying potential trading partner,
2. Selecting a specific partner, and
3. Executing the transaction.

1.4.3. Characteristics Of E -Marketplaces

The core function of B2B e-marketplaces is to make information and transactions flow more efficient. An e-marketplace can be described as an electronic intermediary between

suppliers and customers that matches buyers and sellers together in a digital form in order to: conduct pre-sales activities, transact sales, and complete post-sales activities. Habitually, a buyer has to establish connections and relationships with many suppliers, who often use different information technologies, and vice versa. By using an e-marketplace as a tool for reaching the market, the buyer needs to establish only one connection with the e-marketplace which creates the connection with all the suppliers on the market and they all use one pre-set electronically standard.

The e-marketplace provides a virtual space where buyers and suppliers come together to explore new business opportunities. The goal of the e-marketplace is to attract the biggest possible number of buyers and suppliers, which will become members of that e-marketplace. Buyers bring purchase needs while suppliers bring selling offers. The e-marketplace will then match purchase needs against selling offers, encouraging its members to undertake new trading exchanges.

Typically, a prospective supplier publishes offers while a prospective buyer searches for products or services by looking up offers on the marketplace or vice-versa, a buyer submits requests for proposals and suppliers respond with their offers.

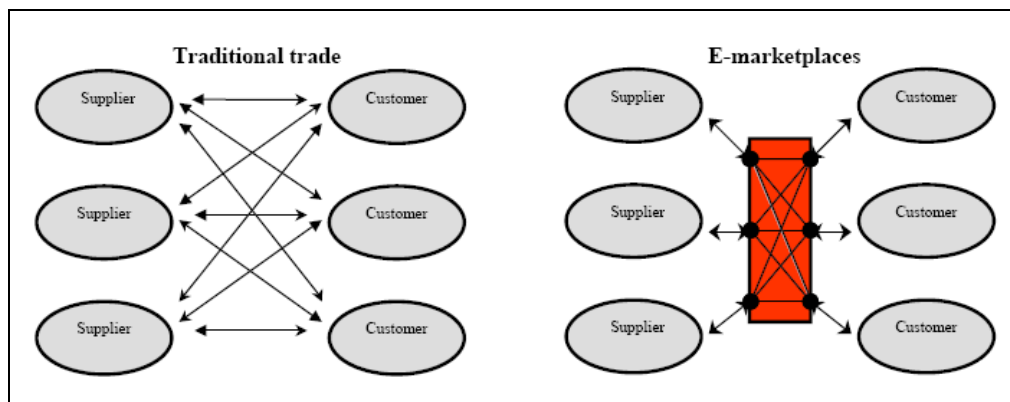


Figure 2: The e-marketplace as an electronic intermediary between suppliers and customers
(Source: Bygdeson, Gunnarsson and Onyango, 2000).

In the figure above, the arrows are illustrating the electronically trading interconnections between suppliers and buyers. By connecting to the e-marketplace, each participant is connected to all other participants in order to support transactions, share information and

documents as well as enable cooperation. There is competition between suppliers and between buyers, but the e-marketplace provides a space which also facilitates cooperation.

In short, e-marketplaces create value in three major ways (Blanchard and Roussière, 2000):

1. Bringing communities of buyers and sellers together;
2. Providing relevant content and market information;
3. Improving liquidity and lowering transaction costs.

As stated above, organizations decide to adapt their trading processes to e-marketplaces in order to profit from the various benefits like lowering transaction costs and improving information flows. By doing this they are facilitating improved planning and more coordinated actions to reduce uncertainty (Roberts & Mackay, 1998).

1.4.4. Business Dimensions Of E-Marketplaces

In the academic literature e-marketplaces can be differentiated along six segmentation dimensions: business model, order processing mechanism, revenue model, market characteristics and product specifics and e-marketplace services. These diverse dimensions are partially related to each other, but they are important for an integrated marketplace characterization (Thorelli 1986, Elofson, Robinson 1998, Lief 1999, Sawhney, Kaplan 1999, Sculley, Woods 1999, Hartman 2001).

A. Trading Mechanisms

B2B e-marketplaces may offer two fundamental ways of setting prices: fixed or dynamic pricing. According to these two ways of setting prices, four different trading mechanisms can be outlined: catalogue, auction, reverse auction and exchange. Catalogues are typically a fixed price mechanism and the remaining ones involve dynamic pricing. Through electronic B2B, each of these mechanisms enhances the price transparency of the marketplace.

1. Catalogue

B2B e-marketplaces use catalogue trading mechanism in order to streamline purchasing by aggregating the product catalogues of many suppliers in one place and in one format, so that buyers can easily compare it (Morgan, Witter, 2000). With the help of Internet tools, these catalogues can present extensive product information, including multimedia content. The product prices posted in a catalogue are normally fixed list prices. The offers of different suppliers permit both, a greater selection and a comparison of price and quality (Wichmann & Weitzel, 1999).

2. Auction

Auctions are a revolutionary new pricing model for many markets, in which multiple buyers and sellers bid competitively on a contract (Sculley & Woods 1999). E-auctions allow companies to take literally hundreds of bids from all over the world, which would not be possible in the convenient way of purchasing (Porter, 2000).

In a *seller driven auction* (or forward auction), prices are set dynamically through buyers bids submitted for products from individual suppliers. The prices are moving up as a result of bidding among buyers (see figure 3). Sellers benefit from broader customer access, lower transaction costs and better understanding of market pricing.

3. Reverse Auction

In a *buyer driven auction* (or reverse auction) multiple suppliers bid competitively to provide product to individual buyers. As a result, prices tend to fall over time (see figure 3).

Preparation for a reverse auction usually takes the form of a buyer issuing a “request for quotation” (RFQ) or a “request for proposal” (RFP) in which product specifications and commercial terms are presented. The buyer identifies the sellers which will participate in the auction. As a result, the sellers prepare their bids and submit them during the auction itself, with the option to move their prices down as bidding proceeds. A reverse auction may be organized such that the lowest bid does not automatically win. A buyer has the authority to award the contract to a bidder quoting a higher price if the difference in price is worth it because of quality, location, or other such considerations. As a result, buyers benefit from broader supply base, lower search and transaction costs and more dynamic pricing.

4. Exchange

The exchange mechanism enables buyers and seller to negotiate prices in a bid and ask system, similar to Stock Exchange systems. An exchange is a two-sided marketplace where buyers and suppliers negotiate prices, usually with a bid and ask system, and where prices move both up and down. In this sense the exchange is the only B2B e-marketplace trading mechanism that supports true dynamic pricing. A successful exchange format requires a critical mass to provide liquidity, allowing buyers' access to numerous suppliers.

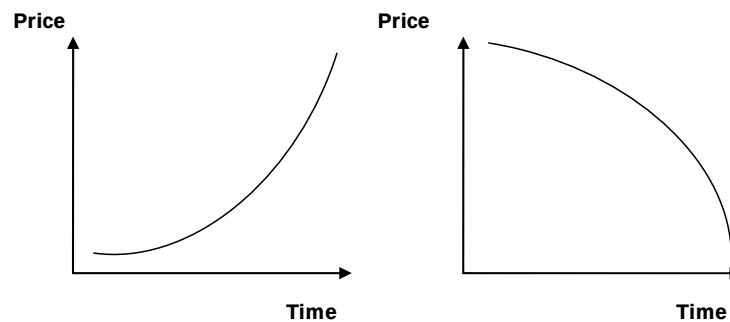


Figure 3: Seller-driven and buyer driven auctions
(Source: Sculley & Woods 1999, pp 81)

B. Horizontal And Vertical E-Marketplaces

B2B e-marketplaces can be divided in two different types: horizontal and vertical (Blodgett and McCabe, 2000).

Horizontal e-marketplaces offer a product or a service across industries and increase their scale by attracting new users. Horizontal markets are functional in nature and facilitate the purchase and sale of goods and services used by many industries. To a great extent the goods and services bought and sold via horizontal e-marketplaces are standardized in nature.

Vertical e-marketplaces are industry-specific (ex. e-marketplaces designed for construction industry, chemical industry) and extend their scope step-by-step along the value chain. They

aggregate supply or demand in vertical industries. They require a good deal of industry knowledge and their purpose is to optimise buyer-seller relationships.

C. Ownership Control Models

Another dimension that is important in describing an electronic marketplace is ownership control or bias. According to this dimension there can be three types of e-marketplaces: focusing on sellers, focusing on buyers and neutral marketplaces, which do not favour either sellers nor buyers but attract both (Kaplan & Sawhney 2000, Rosson 2000)

Neutral e-marketplaces are opened for all suppliers and buyers in order to explore business opportunities. They are administrated by a third party who is not a participant buyer or seller in the marketplace and does not favour either buyers or sellers. The main advantage can be achieved through transaction cost reduction due to network effects of bringing together many market participants (Hartman, 2001). Moreover, the marketplace enables a real-time connection of the network participants.

The seller-driven e-marketplace is an e-marketplace promoted by a consortium of suppliers who place offers within the same industry to many buyers. A seller driven e-marketplace adds value to the suppliers through offering electronic integrated systems for order, payments and logistics.

The buyer-driven e-marketplace is maintained by a few large buying companies that aim at attracting many suppliers in order to buy products, beneficiate of lower prices and make more efficient the procurement process. Buyer-controlled marketplaces are set up with the aim of shifting power to the buyer's side (Berryman et al. 1998, Roberts et al. 1999).

D. Public And Private E-Marketplaces

Another dimension of e-marketplaces closely related to the above is the public or private dimension.

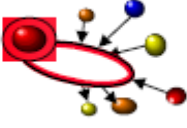
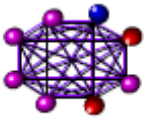
	Public B2B E-Marketplace: • Open trading environment (many-to-many); • An entity that brings together buyers and sellers (industry, geographic region or affinity group) where they can interact and transact. • Buyers' main value: increased transparency and the aggregation of products and potential suppliers. • Suppliers' main benefit: their products are exposed to all buyers gaining access to new business opportunities. • The increased transparency encourages open sourcing and enhances competition among suppliers.
	Private B2B E-Marketplace: • An entity connected to its own group of business partners (one-to-many); • The participants are normally the suppliers and customers of that particular entity (buyer). • Buyers' objective: to streamline and optimise various business processes (buying and selling) with existing partners. • Facilitates cooperation.
	Consortia E-Marketplace: • Is typically jointly owned by several large enterprises (often competitors); • It facilitates collaboration and the performing of business transactions among trading partners; • It addresses many-to-many relationships. • Objective: optimisation of value-chain processes.

Table 3: Marketplace types: public and private.

(Source: Gartner Research, 2001).

E. Revenue Sources

Revenue models for generating money in the online space vary from company to company. According to the literature there have been identified five major sources of revenue: transaction fees, membership/license fees, advertising, professional service fees, value-

added service fees (Reilly 2000, Trepp, 2000). Many marketplaces are not committed to just one revenue model and employ multiple strategies at the same time.

Major sources of revenue:

- *Transaction fees:* The e-marketplace charges a fee that is based on the value of the transactions conducted on the market. In order for the e-marketplace to earn substantial revenues from transaction fees, the amount of transactions has to be relatively high, given that the fee is based on a percentage of the value.
- *Membership or license fees:* The most established form is a one-time joining fee and an annual maintenance fee for preserving the membership. The membership model is widely used. The price for membership must reflect the benefits and cost savings for the members, otherwise the e-marketplace will not be able to create a critical mass of members.
- *Advertising:* Several e-marketplaces generate revenues based on advertising. The advertising can be in the form of banners, hyperlinks to companies' web sites, links to companies' presentations or commercial e-mail to targeted members.
- *Professional service fees:* Some e-marketplaces provide consulting services in the form of implementation and training services for their customers, usually on a time basis. The companies are billed in accordance to the number of consultants and the time spent in order to provide the consulting services.
- *Value-added service fees:* This revenue comes from third parties whose services add convenience and value to e-marketplace transactions: inspection services, logistics, trading partner authentication, credit information services and financing services. The partners are often tightly integrated to the e-marketplace for ease of use and increased customer value.

To sum up this section it can be said that the transaction fee model and the membership/license fee model are appropriate as main sources of revenue.

F. E-Marketplace Services

Another dimension that differentiates the B2B e-marketplaces is related to the services they offer to their users. The marketplaces offer a variety of possible services. Schmid (1993) described the transaction according to three phases: information phase, negotiation phase and settlement phase. During the information phase a buyer looks for suppliers and products to evaluate. In the negotiation phase, demand and supply are being matched and the best offer in terms of price, quality, etc. wins. The settlement phase consists of delivery and payment. This frame will be used in order to group the services offered by B2B e-marketplaces according to the transaction phases.

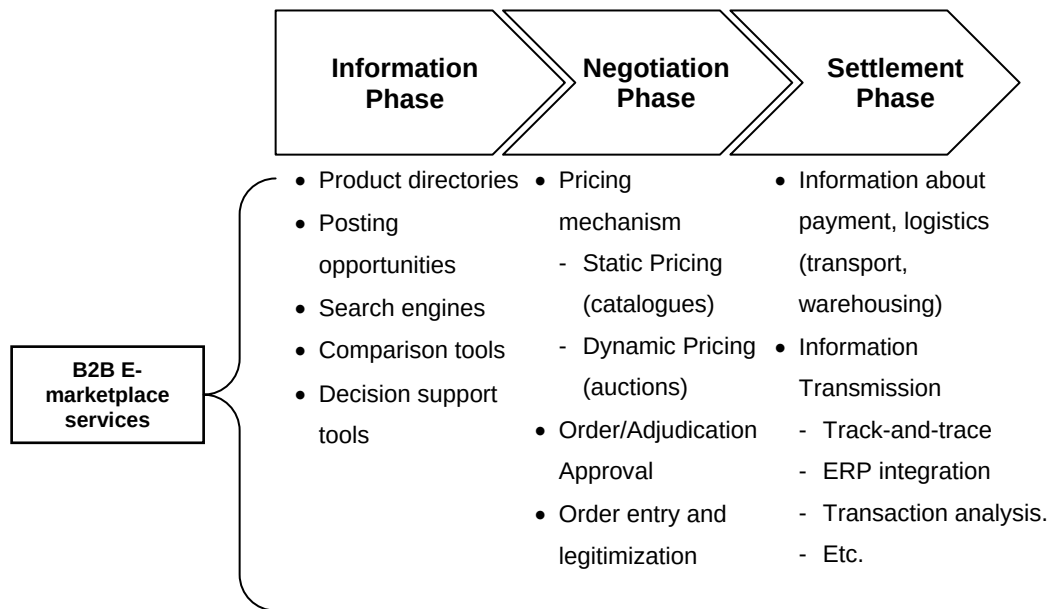


Figure 4: Services provided by Electronic B2B marketplaces
(Adapted from Oppel et al., 2001 – IMP Group Paper)

In reality, e-marketplaces are a combination of the above transaction functionalities, resulting in different business models that have changed over time in search of profitability.

1.5. E-Marketplace Benefits

E-commerce is one of the most exciting economic and technological trends of recent years. It provides a new marketplace, more opportunities to sell and market the product, and greater competitive advantages.

The motivation of suppliers as well as buyers for e-marketplace participation is closely related to the perceived outcome of their participation. This is not only in terms of the benefits of joining an e-marketplace, but also in terms of the possible consequences of not joining (Rask and Kragh, 2004). As a result, an important question to be asked is why organizations decide to buy and/or sell goods or services in e-marketplaces. This subchapter reviews the major reasons for e-marketplace participation outlined in the existing literature, translated in derived benefits from going online.

An e-marketplace does more than establish an electronic place for buyers and sellers to meet, but also streamlines workflows, enhances flexibility and drives transparency in the buyer-seller relationship. In the same time, it improves the accuracy and availability of information on the supply and demand side, facilitating collaboration as well as control. According to Baker (2000) and Hartman (2001), the major benefits of electronic marketplaces can be included in three groups: process improvements, cost reductions and new business generation.

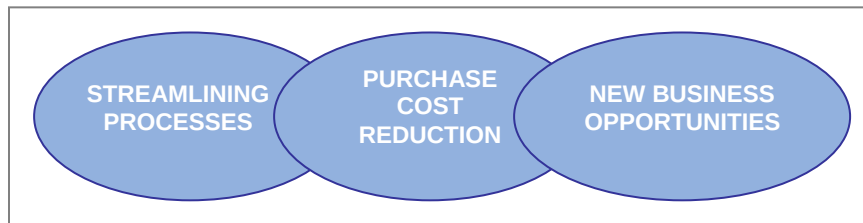


Figure 5: E-marketplace benefits

(Source: Baker, 2000, p. 105)

A. Process Improvements

According to Kajüter & Ruland (2000), process improvements can be described as simpler and faster ordering procedures, reduced paper work, easy online comparison and less human errors. The result of these improvements is a streamlining of the workflows. These benefits lead to significant time savings through the streamlining and automation of processes, and an increase in the performance of interorganizational information channels (Bakos 1991b), such as reducing the time spent on evaluating alternatives, selecting, contacting and communicating with suppliers. Another important opportunity is the

possibility to reduce the cost of integration with existing partners - a benefit referred to as the “electronic integration effect” (Malone et al. 1994).

Both buyers and sellers can benefit from the marketing instruments available online in order to better promote their company, products and services. By using catalogues, curriculums, banners, etc., companies can achieve a better visibility level. In the same time, belonging to a successful e-marketplace is like belonging to a business community which turns out to be an important asset for the image of the company.

B2B marketplaces can also free up procurement personnel by eliminating routinized tasks like transaction processing (Baker, 2000) and increase the qualification level, so that they can do more strategic work such as negotiation preparations.

B. Cost Reduction

E-marketplaces bring significant cost reduction by favouring aspects like: increased price transparency, efficient market and pricing mechanisms, comparability of products, prices, suppliers and buyers (Hartman, 2001).

For buyers, increased price transparency is generally recognized as leading to increased competition among suppliers which leads to a decrease in prices in general. In the same time, an e-marketplace reduces the search costs of obtaining information about prices and suppliers (Bakos, 1991a). Since all transactions and processes are made using the same electronic platform, all players have access to the same type of information. This contributes to reducing the asymmetry of information.

The general reduction in transaction and interaction costs benefits suppliers by reducing contact, communication and negotiation costs as a result of the time savings realized when, for instance, suppliers do not have to pay repeated visits to customers, or prospective customers, to obtain orders from them (Eng 2004; Grewal et al. 2001). The communication process becomes therefore more effective and efficient: reducing the number of interlocutors and in the same time the number of errors made with human intervention.

Another advantage is the easy access to purchases and sales history by means of a rapid consultation of the database which can help the buyer or the supplier to better evaluate its business partners.

C. New Business Opportunities

In addition to the operational benefits presented above, e-marketplaces can provide their users with more strategic options, by generating new business opportunities due to access to new customers and suppliers, strategic industry information, higher customer satisfaction and development of completely new markets (Baker, 2000).

Geographically dispersed buyers and sellers find it easier to interact because of the low costs of getting connected. E-marketplaces enable fragmented buyers and seller to find each other through B2B marketplaces without incurring search expenses, travel expenses or high commissions for using intermediaries (Stundza, 1999). E-marketplaces eliminate geographical barriers as well as time zone differences, allowing companies fast and easy access to centralized information 24h per day. These benefits significantly improve the reach to new business opportunities (Sculley & Woods 1999).

E-marketplaces allow buyers access to a larger and more diversified pool of suppliers than non-electronic markets, enable buyers to obtain relatively lower prices, wider product assortments and better quality (Eng 2004; Kaplan and Sawhney, 2000). They contribute also to better purchasing decisions by enabling buyers to assess competent suppliers which might otherwise not have been considered (Christiaanse and Kumar 2000; Emiliani, 2002).

Suppliers may join e-marketplaces with the explicit intention of improving their competitive position through, for instance, a wider market reach (Kaplan and Sawhney 2000; Sashi and O'Leary 2002). The immediate access to a larger customer base may be used to increase sales without increasing selling costs.

Aggregation of buyers and sellers and collaboration between businesses partners are two other value propositions provided by e-marketplaces (Le, 2002). The aggregation of demand and supply overcomes market fragmentation, providing suppliers with wider

market access and buyers with greater choice. Interorganizational collaboration enables market participants to build and deepen their business relationships for the purpose of streamlining overall supply chain processes. E-marketplaces facilitate the buyer-supplier relationship by enhancing communication and information exchange, reducing costs, risks and uncertainty (Roberts & Mackay 1998).

Besides all these benefits mentioned above, the passing towards the Internet economy causes also disadvantages (Bacheldor, 2000). The disadvantages may appear when the investments made in process reorganization and automation do not take into consideration the final users. If the company's procurement personnel or its suppliers aren't prepared to take advantage of the Internet benefits, the effect will be not an improvement of the efficiency but greater confusion. If the focus of the e-marketplace is only to optimise the transaction and its related costs, inter-personal interactions are reduced and with them, the social bonds created between companies.

All the advantages presented above, show that the adoption of e-tools opens the possibility to increase both efficiency and effectiveness. By thoroughly considering all these factors, managers are able to identify the appropriate procurement strategy to gain sustainable and tangible success.

1.6. Final Remarks

As presented in this first chapter, an important connection between a company's success and its e-business initiatives is made by the readiness of buyers and suppliers engaging in electronic interactions and their willingness to change and adapt to the realities of the new Internet economy.

The essence of moving towards an e-business environment involves a major organizational change which occurs at three corporate domains: technology, process and people, both at strategic and operational level. To overcome resistance to change, each component must be aligned and prepared, along with the enabling technology and strategic initiatives in process changes.

The next chapters will try to make the connection between e-tools and their involvement in the procurement process as well as determine their place in the buyer supplier interaction process. The view that will be adopted is of a strategic tool meant to streamline the transactional, informational and cooperation processes which occur in the business to business environment.

Chapter 2: Understanding The Procurement Process

*“The only certainty in life is that
everything will change...”
(Heraclitus)*



“Change is a key feature of any economic system.” (Brito, 2001a). The realities of the new business environment are changing the way companies interact by bringing new benefits and new perspectives over the procurement process. The buyers are discovering new benefits from collaborating with other companies for mutual benefit, rather than being on a permanent “win-lose” situation. Modern procurement approaches are reflecting this changing emphasis towards the importance of quality and innovation of suppliers as opposed to pure price negotiations (Hakansson & Eriksson 1993). However, different approaches are suitable for different purchase situations depending on the specific circumstances the buying firm embraces.

In this chapter, we examine the importance of the purchasing function in a company and how this affects the buyers, suppliers and the implications for the different purchase situations. The main objective is to understand what happens in these procurement activities.

The chapter begins by presenting the significant changes in procurement (section 2.1). The next section proposes different classification models of purchase situations, according to four underlying dimensions: product characteristics, market characteristics, supplier characteristics and relationship fit (section 2.2). In order to fully understand the purchase situation, the procurement objectives are presented and the decision making process (section 2.3) as well as the notion of supply chain (section 2.4). After this analysis of the purchase situation, we make the passing towards the new reality which characterizes today procurement activities: use of the new Internet technologies to streamline processes (section 2.5)

2.1. New Trends In Procurement

In order to fully understand the nature and amplitude of industrial markets it is necessary to understand the notion of industrial purchasing. Purchasing started out as a support function. Over time, with all the changes in the business world, it has evolved to become a crucial component in the organization's functions. The growing pressure of global competition has led both, academics and practitioners, to the recognition, that procurement is an important contributor to a firm's competitive advantage (Reck & Long, 1988, Hartman et. al. 2001). An appropriate sourcing strategy can contribute significantly in order to increase profitability, market share and technological innovation (Hartman, 2001). The efficient administration of the purchasing function within a firm can enhance its ability to achieve its desired competitive position.

This increased importance of procurement relates to three classic criteria of industrial performance as "cost, quality and technology" (Donada, 1999, p.1). Increased cost, competition and customer pressures have driven companies to review internal processes and take into consideration the enormous savings potential from indirect spending, while seeking to increase efficiency.

Inside every company there is a procurement opportunity that offers immediate savings, higher quality and improved profits. Taking advantage of that opportunity is one of the most critical levers a company can employ. Purchase costs account on average for more than 40% of total expenses (Hartman et al., 2001). Reports suggest that by focusing on procurement spending, companies can reduce the overall cost of materials by 12-15% (Forrester Research, 2000).

Besides cost benefits, purchasing and supply management have a major impact on quality. Companies have started to specialize and to concentrate on their core competences and increasingly outsource activities to suppliers and thereby become more effective and efficient (Gupta & Zhender 1994). This development reduced a company's internal added value in the product value chain to its core competences. At the same time, the supplier's influence on quality increased to a dominant role in some cases (Cusumano & Takeishi

1991). Due to the increased outsourcing of production, the suppliers are pushed to cooperate (Hartman et al., 2001).

Information system integration and ICT which started to be used on a large scale, have led to tremendous cost savings. “Time is the secret weapon of business” (Simon 1989, p.72). Advantages in response time provide leverage for all the other competitive differences that make up a company's overall competitive advantage. The impacts of information technologies on the procurement process have started to receive more attention in the last years (Gebauer et. al., 1998, Yen and Ng, 2003), and the results show improvements in terms of:

- ✓ Time - is reduced and the supply chain is shortened, during the migration onto Internet, in the form of information reach, communication flow or exchange between buyer and seller. The processes are operating more efficiently while minimizing time within supply chain.
- ✓ Cost - which cannot be measured separately from time as they are often related to each other; costs are reduced due to efficiency improvements.

The focus of attention has shifted towards the significance of cooperative buyer-seller relationships (Harland et al. 1999). When a company uses various suppliers having a portfolio of relationships, has to meet the requirements of different types of transactions (Roberts & Mackay 1998). As a result, cooperation with suppliers becomes a critical process. To develop their activity, companies have to interact with other organizations, and this process tends to “create lasting and stable relations through which firms adjust products, production and routines.” (Brito, 1996, p.2).

Based on these trends one of the most important objectives of the purchasing function is the development of a supplier network (Ellram 1991). That is in view of the fact that a firm's ability to produce a quality product or service at reasonable cost and in timely manner is mainly influenced by its suppliers' capabilities (Hahn et al. 1990).

As presented by Sheth and Sharma (1997, p. 95), there are four underlying reasons for supplier relationships: “increased cost efficiency, increased effectiveness, enabling

technologies and increased competitiveness”. Firms conclude that they will more readily attain long-term cost reduction by forming closer working relationships with “key” suppliers (Harland et al. 1999). However, partnering does not necessarily guarantee success as it causes costs, high resource intensity and risk of dependency. The relationships need to be *adapted* to the specific purchase situation. As a result, firms have a portfolio of different types of relationships rather than relying on only one type (Bensaou, 1999).

Within this frame, the appropriate analysis of the purchasing situation is even more important since the establishment of electronic marketplaces and Internet-supported trading (Kaplan & Sawhney, 2000a, 2000b), is building a new dimension for purchasing with reduced interpersonal contact but transactional focus.

2.2. Purchase Situation Dimensions

The study of the purchase situation, buyer seller interaction and relationship development, occupies a central place in purchasing and supply as well as business-to-business marketing literature. There are a number of variables which constitute some dimensions of the purchase situation and there are going to be presented in this subchapter. According to the academic literature, we can consider four dimensions that constitute the different facets of the purchasing process. The different approaches can be structured by four segmentation dimensions: product, market, supplier, and relationship characteristics.

When referring to the term purchase situation, we consider all relevant forces related to the acquisition of required materials, services and equipment, which have potential impact on the way buyers and sellers work together (Hartman et. al. 2001).

A. Product Characteristics

It is important to mention that industrial products and services are difficult to separate, taking into consideration the fact that most of the products have some service elements associated with them (Ford et al., 2002).

A first product characteristic that has to be taken into consideration is the *purchasing volume*. One of the dimensions in which it can be measured is the monetary spent or the purchased volume (Elliott & Glynn 1998). The economic volume can be analysed by applying an ABC analysis (or Pareto analysis). This method of product management is also referred as the “80/20 rule”. Products are divided into three ranks, A, B, and C, depending on their relative importance. For example, "A Rank" indicates the most critical product group. This means that 20% of a company’s suppliers represent 80% of the value spent. This classification as it can be seen in the figure below differentiates suppliers according to their relative importance (economic importance) to the buyer: suppliers with significant spent from the mass of suppliers with only small purchase volume (Hartman et al, 2001).

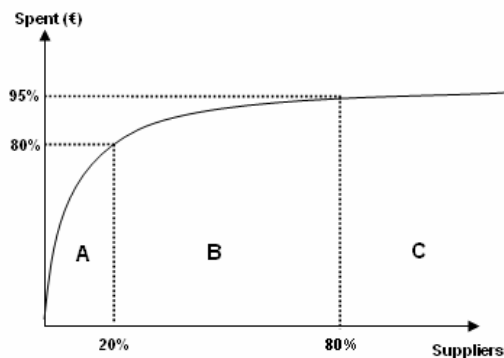


Figure 6: ABC analysis adapted for construction industry
(Source: Hartman et. al, 2001)

Another product characteristic that has to be taken into consideration when considering sourcing strategies is the *product importance* which is not an intrinsic characteristic of the product, being more related to the way in which the buyer perceives its importance. The way it is perceived by the buyer will rather depend on the “product’s ability to satisfy the goals of the buying firm” (Metcalf & Frear 1993).

The last characteristic we have selected to describe this dimension and determine the purchase importance, is the *number of purchase transactions* caused by a supply. Products with an extremely high number of transactions have a high importance, as they cause a dominant amount of transaction costs (Hartman et. al. 2001).

The differentiation of suppliers and their classification is a must in managing supplier relationships, since not all suppliers are to be dealt with in the same way.

B. Market Characteristics

Another dimension that influences the purchase situation is represented by the different market aspects.

A characteristic that defines the market is the *supply risk* determined by production shortages, product availability and availability of alternatives. This means the “degree to which a buying firm has alternative sources of supply to meet a need” (Cannon & Perreault 1999, p. 444). This risk includes factors like: supply problems with substitutes, seasonality, transport logistics complexity and delivery time as well as production know-how and product and production complexity (Lamming et al. 1996).

The second market characteristic besides supply risk is the *buying power*. The buying power describes the governance in the purchasing situation. Porter (1996) has identified five competitive forces that shape every industry and every market: new entrants, bargaining power of buyers, bargaining power of suppliers, intensity of rivalry and substitute products. When the buyer's power is significant, they can force prices down, demand higher quality products or services, and, in essence, play competitors against one another. In industries where buyers have greater power, suppliers must accept conditions imposed by the client, including price, technology, quality, delivery, payment method, etc. Buyers exercise more power when they are large-volume buyers, the product is a significant aspect of the buyer's costs or purchases, the products are standard within an industry, there are few changing or switching costs from one supplier to another.

The third individual category of market characteristics represents the *legal regulation factors*. An identification of all legal aspects, which affect the way commercial affairs should be conducted as well as the way organizations should be managed, is relevant (Saunders 1997).

The market attributes characterizing the purchasing situation are highly correlated to the product characteristics and when developing a supplier relationship strategy, they should be considered together.

C. Supplier Characteristics

According to Hartman (2001), many supplier aspects have been presented in the academic literature, regarding supplier evaluation and selection process, which are an important part of the purchasing strategy. Suppliers can be evaluated according to some features. The first group of characteristics is the *supplier's resource base* by means of revenues, assets, employees, R&D, production capacity and information (Hartman, 2001). In business markets, the buying company depends in part on these resources of the supplier (Ford et al. 1999). There is a mutual “inter-dependency...between activities of organizations, when the performance of each of them depends on the interaction between the different companies. A typical example is major construction projects where resources from many companies are used at the same time and where the success of the project depends on the interaction between different companies” (Ford et al. 2002, p.39). The sustainability of a buyer-supplier relationship depends on the resources involved and more sustainable are relational and organizational resources (e.g. cooperation and loyalty) or operational linkages. Information sharing is considered to be the most sustainable resource (Hartman et al., 2001).

Another aspect for supplier evaluation is *supplier's competences*, characterized by product, process, support functions and management capabilities, as well as reliability in respect to quality, delivery and punctuality of delivery. Additionally, characteristics such as flexibility, service and communication are integrated in the competence perspective (Hartmann, 2001).

A further supplier characteristic is the *company network* in which the supplier is embedded. Each company's suppliers will also have relationships with their other suppliers and with their own customers. All these relationships are affected by others and are intertwined in a network, representing “the business arena in which the business marketer must operate.”

(Ford et. al., 2002, p.29). In order to understand the behaviour of a company, we have to look at its relationships with other companies, its strategy being influenced by the strategies of other companies.

For every buying company, there is the notion of a “standard” or “key supplier”, describing its level of importance ((Hartman et al., 2001, Wildemann 1999, p. 442). This means that there are some suppliers whose capabilities are important for the buying company leading to the creation of a long term relationship. The notion of key supplier is connected to the notion of *supplier value*, which summarizes the various reasons why a buyer should work together with a certain supplier. According to Walter et al. (2000), some of these reasons can be: purchase cost savings, large purchase volume and safeguard suppliers (i.e. suppliers who deliver even if it may be a relatively unfavourable deal), joint innovation development, etc. These aspects contribute directly to the buyer’s profitability independent from further supplier relationships and determine the value of a certain supplier relationship.

D. Relationship Characteristics

Companies and relationships in a network are inter-dependent because relationships evolve to meet the requirements of companies by linking their resources and skills. We cannot analyse a company in isolation but by looking at it in relation with others. According to Ford et. al. (2002), the relationship between companies is a resource by itself, for two reasons: first, the relationship bridges the resources of the two companies and second, the relationship provides each company with access to the resources of other companies in the network, via the relationship.

For a relationship to work there has to be *trust* between the parties. Morgan and Hunt (1994, p. 23) conceptualise trust in terms of one party having confidence in an exchange partner’s reliability and integrity. Additionally, a very important dimension of trust is “supplier reputation” (Doney & Cannon 1997, p. 37) and supplier’s image. There is a strong correlation between the length of a relationship and trust (Hartman et al., 2001).

Very close related to the concept of trust and very important for successful relationships is *commitment*. A company demonstrates commitment to build and develop a relationship by

agreeing to adapt its offering (Ford et al. 2002). This means that the company is willing to accept immediate costs for later benefits, by making monetary investments in the relationship.

In 1999, Bensaou analyses the seller's and buyer's motivational *investment*. Once one of the companies has made investments, switching costs are incurred. The investments in relationships, often translate into mutual adaptations which bind the companies together and generate and reflect mutual commitment that at the same time constrains and empowers the companies (Hakansson and Snehota, 1995). This means that the higher the commitment, the minor the possibility to break a supplier relationship.

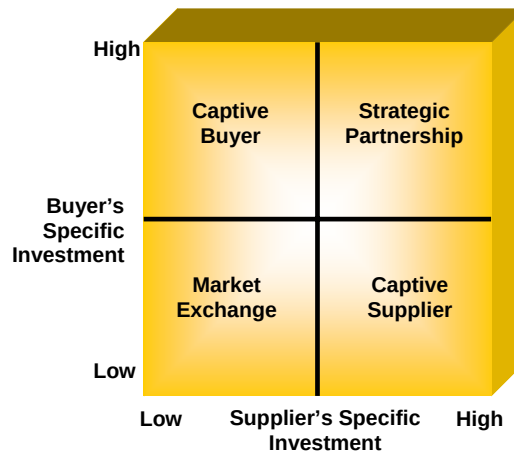


Figure 7: Types of Relationships
(Source: Bensaou, 1999)

Organizations maintain a portfolio of relationships with suppliers, ranging from low-involvement to high-involvement relationships (Gadde and Snehota, 2000). Spekman, et al. (1999, p. 114) emphasize that “not all suppliers are created equally, nor should they be”. These findings support the view that different characteristics of supplier relationships facilitate different performance outcomes.

Nonetheless, a high level of dependency does not favour entrepreneurial behaviour (Wilson and Gorb, 1983); in such cases, companies tend to concentrate on the relationship with their principal customer rather than on new markets and new tendencies in the industry, thus

over-specializing their firm and neglecting its development and adaptation required to survive and prosper in the longer term within an ever-changing business environment.

Organizations may also maintain long-term strategic relationships that exist in a low-involvement manner, with little investment in creating mutual dependencies (Araujo et al., 1999). Dyer et al. (1998, p. 73) describe those relationships as having “less face to face communication, less assistance, fewer relation specific investments, and frequent price benchmarking”. These relationships are often intended to deliver definable short-term benefits, such as price reductions, delivery improvement and quality gains (Cousins and Lawson, 2006).

Another dimension of the relationships is that they “act like pipelines bringing the technologies of the two companies together.” (Ford et al. 2002, p. 69). It can be said that they create the frame within which technological development takes place and are essential to exploit and develop technologies.

Satisfaction is another factor that characterizes a relationship. Satisfaction can be defined as “the degree to which the business transaction meets the business performance expectations of the partners” (Wilson 1995, p. 337). A relationship will not endure, if the supplier is unable to meet the buyer’s expectations, then the buyer will seek alternative partners (Wilson & Jantrania 1996).

All these factors can offer an outlook which can be of assistance when judging the strength or weakness of a relationship. Nonetheless, the task of business marketing is to manage and audit each single relationship with the customers, as well as see it from the network perspective.

2.3. Procurement Objectives And Decision Making Process

The organizational buyer’s perspective over the purchasing process is close related to the accomplishment of a series of organizational objectives. The industrial products and services that are acquisitioned by a buying organization will be further incorporated in the

products and services which represent the company's core activities. They facilitate the buying company's operations or are meant to be resold (Kotler, 2001).

The objectives of organizational purchasing focus on buying "the right articles, in the right quantity and by the right price, in the right moment and at the right place." (Webster et al., 1991, p. 23). In other words, the buyer intends to achieve availability of the needed product, in the right moment and place, with the desired quality and technical specifications, at the best price, whilst establishing and developing long term relationships with its suppliers.

As a rule, the buyer's level of exigency is high. According to Ford et al. (2002), customers are not interested in products or services themselves; they are only interested in what products or services will do for them and the problems that they will solve.

The purchase process involves a series of decision-making activities, where each step is a process in which different kinds of information are exchanged (Cano et al., 2005). It is a complex and multidimensional activity, encompassing many factors which have to be considered taking into consideration the nature of interaction and relationship development between buyers and sellers. Tullous and Utecht (1994) propose an eight-phase purchase process model, which typifies a series of information interchanges linking buyers and sellers. These eight phases include: (1) Anticipate or recognize a problem and general solution; (2) Define the product type needed; (3) Develop specifications (characteristics) of the product needed; (4) Search for qualified suppliers; (5) Acquire and analyse proposals; (6) Evaluate proposals and select supplier; (7) Place and receive an order; (8) Evaluate performance of product and supplier. Each of the stages in the process could be more or less distinct, some stages may be repeated, and the process may also leap between the stages.

The procurement activities are subject to environmental influences affecting the process beyond the control of the procurement staff. On the basis of the research undertaken by Webster and Wind (1972), Kauffman (1996) identified four sources of influence that impact buying decisions and choice processes. It states that buying behaviour is a function of: individual characteristics, group factors, organizational factors and environmental factors. Gadde and Håkansson (1993) identified four factors that affect the internal procedures of

the purchasing company: the technological and organizational structure of the company, the knowledge and attitude of the personnel with regard to purchasing. In addition to this, Webster and Wind (1972) propose five different roles performed by buyer centre participants:

- Users; who actually use the purchased product.
- Deciders; who select the vendor or supplier of the product.
- Influencers; who add information or decision criteria to the decision process.
- Buyers; who execute the contractual arrangements.
- Gatekeepers; who control the flow of information into the buying centre.

In regards to the gatekeepers, Pettigrew (1975) studied the flow of information during a purchase process and observed the importance of individuals controlling the information flow.

The decision process of organizational buyers has become increasingly complex over the past few years. As a result, purchase decisions of buyers have become increasingly more complex, multidimensional and multifunctional. In order to fully understand the characteristics of the purchase situation, we first have to understand the objectives of the buying objectives, as well as the steps involved in the decision making process.

2.4. Supply Chains

Among the research and practitioner communities, there are many definitions of the notions of supply chain and supply chain management. According to Mentzer et al. (2001a, p.5): “a supply chain can be defined as three or more organizations directly linked by one or more of the flows of products, services, finances, and information from a source to a customer”. According to the end-to-end view, the supply chain should contain all the elements from primary supplies for a particular industry or company through the final consumption. (Mentzer et al., 2001b). In other words, it consists of different upstream and downstream companies and various service providers that operate within the supply chain.

Supply chain management includes the methods, systems, and leadership that continuously improve an organization's integrated processes (Mentzer et al. 2001a) that provide for increased operational effectiveness and efficiency (Cox, 1997).

These factors are being accomplished to a greater extent in a collaborative manner across a network of linked business partners (Brito 2001, Golicic et al., 2002; Barrat, 2004). Consequently, it is commonplace today for strategic writers to argue that "co-opetition" rather than competition is the way forward (Brandenburger and Nalebuff, 1996). This topic will be furthermore presented in the next chapter.

In recent years the idea of companies focusing on their core competencies has been a key issue (Hartman, 2001). The core competence paradigm is based on companies understanding what internal skills and resources they should own and control and which they should outsource, in order to sustain their business success.

When companies decide to become involved in any supply chain they have to make decisions about how they will control and manage the supply chain itself. They face decisions about where they should position themselves in the chain. Inside the network, there is a struggle for control (Brito, 2001a). In general terms, it can be argued that supply chains must exist as structural properties of power (Cox, 2001). This means that the resources necessary to construct a supply chain will exist in varying states of contestation. This contestation is based on two types of competition (Cox, 2001): (1) horizontal competition between those who compete to own and control a particular supply chain resource and (2) vertical power struggle over the appropriation of value between buyers and suppliers at each point in the chain. By understanding the power struggle over value appropriation between buyers and suppliers around particular supply chain resources, as well as the horizontal contestation between direct competitors, is it possible to understand the environment within which companies operate. It is therefore safe to assume, that a wide variety of supply chains, will have different structural configurations of power.

The notion of power inside the supply chain is also expressed by the relative capacity of the owners of particular resources to appropriate value for themselves from participation in the

chain (Cox, 2001). The value chain exists in parallel with the supply chain and refers to the flow of revenue from the end consumer of any product and service, which provides the revenue stream for each stage of the supply chain. The creation of value is fundamental in all business activities. The supply chain and the value chain therefore exist in a fundamental exchange relationship (Cox, 1997).

The conclusion that can be drawn from this is, therefore, that there cannot be any one single approach to supply chain management that is appropriate in all circumstances. As it was presented from the beginning of this chapter, it is always advisable to see things from different perspective and to adapt the approaches to the different types of situation.

2.5. Internet-Based Procurement Systems And B2B Electronic Markets

Electronic marketplaces have a profound influence on the way in which organizations manage their supply chains and the procurement practices (Eng, 2004). B2B e-marketplaces are an interesting and important phenomenon because of their potential to affect company and supply chain performance and to alter industry structure. They position themselves as intermediaries that employ IT capabilities and business rules to facilitate interorganizational relationships in an industry sector (e.g., construction industry) (Christiaanse and Markus, 2003).

By connecting to the new electronic marketplaces of the World Wide Web, a buyer firm is able to streamline its purchasing activities electronically. As digital intermediaries, electronic marketplaces have three major market functions: matching demand and supply, facilitating transactions and providing institutional infrastructures (Bakos, 1998) as well as fulfil the tasks of aggregating product information, discovering price and providing procurement and industry-specific expertise (Bailey and Bakos, 1997).

Christopher (1998), notes that the goal of supply chain management is to link the marketplace, the distribution network, the manufacturing process, and the procurement activity in such a way that customers are serviced at higher levels and yet at a lower total

cost. In order to meet these goals, the Internet technology has enabled companies to create a new marketplace that facilitates electronic interactions among multiple buyers and sellers (Bakos, 1991a; Choudhury, et.al, 1998). By its nature, the Internet can reach large number of buyers and suppliers with a minimum cost and offering both sides functionalities: buyers are able to browse online catalogues, solicit bids, place orders, and make electronic payments and suppliers will be able to respond to bids, schedule production, and coordinate deliveries (Roberts & Mackay, 1998). Since the Internet is a network, the e-marketplace embraces the same form, and companies have the opportunity to increase their capabilities, coordinate their strategies and compete effectively.

The functions of an e-marketplace can vary according to some dimensions (see chapter 1). In a paper published by IBM et. al. in 2000, the e-marketplaces could provide companies a platform for: (1) core commerce transactions that automate and streamline the entire procurement process, customer management, and selling; (2) a collaborative network for product design, supply chain planning, optimisation and fulfilment processes; (3) industry-wide product information that is aggregated into a common classification and catalogue structure; (4) an environment where sourcing, negotiations, and other trading processes such as auctions can take place online and in real time; and (5) an online community for publishing and exchanging industry news, information, and events.

These capabilities seem to change traditional supply chain management processes by lowering purchasing costs and increasing speed to respond to supply and demand needs (Eng, 2004). They are also beneficial to suppliers, for example, they can have more business opportunities by increasing sales channels to new geographies at lower selling costs, lower inventory requirements, improved order accuracy, and streamlined electronic processes (IBM et al., 2000). Suppliers can also receive payments faster through electronic payments.

According to a study undergone by Eng (2004), there are three dimensions which connect to the perceived benefits of an e-marketplace to supply chain management: unit cost reduction, increased efficiency, and streamlined operations. The study revealed that the auctions facility has the most significant contribution to unit cost reduction. The most

significant contribution of e-marketplace to streamlined operations is improved communications and exchanges. In a sense, the e-marketplace facilitates the procurement process of supply chain management by using the Internet as a platform for communications.

It turns the procurement process into a dynamic one, enabling participant organizations to source and purchase online from multiple suppliers compared to traditional systems. This could result in shorter response time to market demand. (Emiliani & Stec, 2001). The e-marketplace provides a mechanism for companies to control, coordinate, and economise on transaction costs, as it improves information flows and helps reduce uncertainty (Reekers & Smithson, 1994).

2.6. Final Remarks

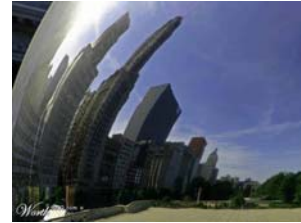
For sustainable procurement management it is very important to have a deep understanding of the purchase situation. The purpose of this chapter was to make the transition towards the new reality that characterizes nowadays the new business environment and impacts all industries. It creates the frame of study which will be used further on to describe the impacts of the Internet tools in the Portuguese construction industry.

Companies and business leaders continually evaluate new methods to improve the profitability of their companies. They achieve these improvements by increasing revenues and decreasing costs. As we showed in this chapter, the purchase situation has a crucial function inside an organization and its dimensions are complex and require different kinds of treatment, according to the situation. It has the capability to offer tools to increase companies' profitability and keep their competitive position.

The next chapter proposes a frame where we will analyze the impact of these new Internet technologies which are causing remarkable changes at company level, relationship level and industry level.

Chapter 3: B2B Interaction Using Information And Communication Technology

*“If at first the idea is not absurd, then
there is no hope for it.”
(Albert Einstein)*



No business is an island, according to Håkansson and Snehota (1989). No matter how large or small, every company is just one tiny piece of the complex puzzle that makes up today's business environment. As long as there was trade, there was interaction between parties, but the changes in the business environment have led to changes in the way in which companies interact.

This chapter's objective is to show how the nature of buyer supplier relationships and the whole field of business marketing are changing fundamentally by using new forms of interaction and information and communication technologies. The first section (3.1) intends to make a short presentation of the perspective and approaches followed throughout this chapter, while the next section (3.2) presents in detail the forms of interaction between buyers and sellers: the interaction model, the industrial networks model and the collective actor model. The next section (3.3) makes the transition towards the use of information and communication technologies and their strategic value for buyer supplier relationships. In section (3.4) are presented the buyer and supplier perspective over the use of electronic tools in accordance to two purchasing models. The last section (3.5) characterizes the new business environment portrayed as simultaneous competition and cooperation (co-opetition).

3.1. General Overview Of The Conceptual Background

From the 1970s onward, a rich literature about business relationships, buyer-seller relationships, and interorganizational relationships has been developed by the researchers in

the field. In order to keep up with the changes in the new business environment, a new trend emerged, focusing on technology use to create value for companies in every important area.

This theoretical part of the thesis will be based on a series of studies which have been carried out over the past 20 years into the nature of buyer-seller interaction and relationships by the Industrial Marketing and Purchasing (IMP) Group¹ and a number of other contributors to the growing theoretical and empirical research base in B2B marketing. The researchers have studied what happens between companies, bringing new insights and new perspectives. This has generated the beginning of a new era in the study of buyer-seller relationships framed as a network of significant relationships between independent companies.

The macro-environmental changes brought about by technological advances and globalisation in the last decade generated significant influences at all levels: the economy, industries, markets and the consumer (Gupta, 2005). As a result, the thesis will also present the new trends and impacts generated by a series of factors, which produced remarkable changes in the way businesses interact as well as in the way in which value is delivered, like: a borderless and connected economy, knowledge generation, globalisation, more active, connected, informed and demanding business partners, within a different competitive scenario. Organizations' attempts to adapt to these changing environmental realities have generated changes in the focus of marketing, leading to the development of the relationship marketing area which has received increased attention from the research community during the last decade.

As described by Håkansson, and Snehota in 1995, a business relationship between two companies can be viewed from two different perspectives, depending on the nature of the analysis. It can be viewed as something built up in isolation by the two parties involved, and as a result the description of what has happened will be likely to focus either on the features characterizing the two parties, or on the nature and characteristics of the interaction process.

¹ The IMP Group was formed in the middle 1970s by researchers originating from the Universities of Uppsala, Bath, UMIST, ESC Lyon and the Ludwig Maximilians University (Munich) with the objective to study the buying and selling processes in industrial markets with interest in inter-organizational relationships and networks.

Or, it can be viewed and explained not in isolation, but in a broader context, as part of a larger whole: a network of interdependent relationships. Any firm, irrespective of its size, has to maintain relations with several other firms, and as a result, several relationships occur. The difference between the two perspectives is the degree to which the development of a specific business relationship is perceived to be connected to other relationships; how dependent it is on other relationships and how its development affects the other relationships. The network perspective of business relationships is able to capture all the possibilities in which companies are connected directly or indirectly through relationships.

As it was said at the beginning, there is extensive literature in the area of business-to-business relationship marketing. The models selected to present the buyer supplier interaction and the influence that ICT brings, are based on theoretical models developed within the IMP group and are going to be detailed in the next sections:

- a. The “Buyer Supplier Interaction Model” (1982) developed within the IMP Group and especially the work of Håkansson in this area.
- b. The "Industrial Networks" model. This approach emerged from the earlier IMP studies (Håkansson, 1982) and is grounded on ideas such as the embeddedness of economic and social action (Granovetter, 1985), the existence of business relationships which are connected, giving origin to networks of business relationships (Håkansson & Snehota, 1990, Håkansson & Johansson, 1992).
- c. The “Collaborative Networks”. They are based on collective action theory, which uses a new type of actor: “the collective actor” which is the net of relationships created in order to cope with a collectively perceived or shared issue (Brito, 2001).

3.2. Interaction And Network Models

In recent years, academic research has focused on better understanding the impact of buyer-seller relationships in different contexts and situations. Starting with the work of Ford (1978), the IMP Group developed an Interaction methodology (Håkansson, 1982) that has brought into the spotlight a new perspective in studying these issues from an empirical point of view.

The impact of the Internet on inter-firm relationships is starting to receive more and more attention from the academic literature. The use of Internet tools and ICT, affects suppliers, buyers, and their relationships in B2B context. The interaction model will be used to describe the impact of e-business tools from a buyer and supplier perspective in a B2B environment. B2B marketplaces are redefining how businesses interact with each other. Inevitably, all businesses will be affected by this revolution. The important question that all companies must answer is: "How?"

3.2.1. Buyer – Supplier Interaction Model

Buyer supplier relationships involve a complex phenomenon which was studied intensively since the 1970s. Consequently, business relationships have been the object of many studies (e.g. Håkansson 1982, 1989, Turnbull and Valla 1986, Ford 1990, etc.). Important research in the area of inter-organisational relationships in business markets was carried out by the IMP Group. The main researcher in this field is Håkansson who has dedicated himself to this area of research since 1970 and established the basis of the Buyer Supplier Interaction Model (1982). The basis of the IMP work is formed by the underlying assumption that there are two active parties in a dyadic relationship, each co-creating value.

The majority of business purchases do not exist as individual events and therefore cannot be examined in isolation. (Håkansson, 1982). That is why, the most appropriate term to define what happens between two or more businesses is reflected by the term interactions. Relational exchanges consist of interactive encounters between buyer and seller that develop into an ongoing sequence of events which incrementally transform into a relationship (Ford, 1980) characterised by economic, social, legal, technical, informational, and procedural bonds (Moller and Halinen, 1999). These episodes of interaction include negotiations, payments, deliveries and social contacts etc. Each episode in turn is affected by and affects the overall relationship (Ford, 1982).

Håkansson and Snehota (1995) define a relationship as being a mutually oriented interaction between two reciprocally committed parties. Therefore, for a relationship to exist, it has to be perceived and acknowledged by both parties. Cunningham (1980) states

that interaction between companies occurs when both parties recognise their mutual interdependence and are interested in each other's resources. This interaction takes place within the context of a relationship between companies (Turnbull et al, 1996).

Furthermore, relationships evolve over time and pass through a series of stages characterised by increased mutual adaptation, reduced "distance" and increased commitment (Ford, 1982). Interorganizational relationships are complex and simultaneously exhibit conflict and cooperation, each company trying to best achieve its goals (Brandenburger and Nalebuff, 1996).

The IMP model provides a useful framework for understanding buyer-supplier relationships. The Interaction Approach takes the relationship as its unit of analysis rather than the individual transaction. On the basis of the empirical studies carried out by the IMP group (Hakansson and Snehota, 1995; Ford, 2002), the business relationships between companies are built on a number of important aspects:

1. Both buyer and seller are active participants in the market. Each may engage in a search to find an appropriate buyer or seller, to prepare specifications of requirements or offerings and to manipulate or attempt to control the transaction process. Within this context, it is easy to recognise both sides of the coin: the supplier wants to increase sales (or margin) and the buyer wants to buy according his present purchasing formulas and improve them.
2. The relationship between buyer and seller is sometimes long term, close and involving a complex pattern of interaction between companies.
3. The links between buyer and seller may involve sometimes adaptations in the organization or operation by either or both companies. In these relationships there are roles each party has to perform, expectations and responsibilities on both sides. These relationships can involve both conflict as well as co-operation.
4. In the case of repeated raw material or component supply it is important to emphasize the importance of previous purchases, mutual evaluation and the completion of each party's expectations.

The focus of the IMP Buyer-Supplier Interaction Model is generally on a two party relationship, a dyadic interaction on two levels: organizational and individual. The interaction is influenced by four variables (Cunningham, 1980): (a) variables relating to the elements and processes of interaction, such as products, information, financial and social exchange episodes; (b) variables characterising the parties involved, both as organisations and as individuals; (c) variables describing the environment in which the interaction takes place, such as economic and social variables; (d) Variables serving to describe the atmosphere affecting and affected by the interaction, such as power, dependence, conflict, cooperation and social distance.

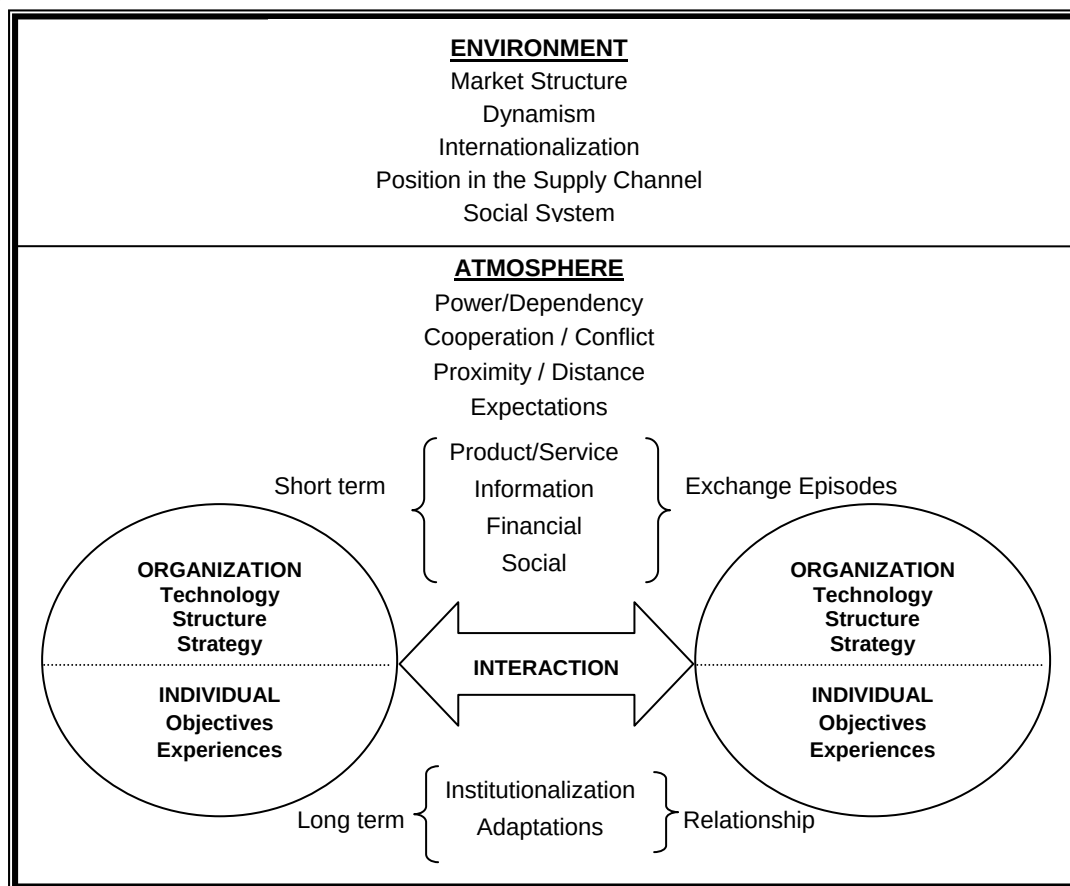


Figure 8: Buyer Supplier Interaction Model

(Adapted from Håkansson, 1982)

A. Interaction Process

The interaction process reflects the form and types of exchanges that take place between companies as well as their development over time. There are four elements which are

exchanged (Håkansson, 1982): product or service, information, financial and social exchange. The exchange of these elements may become routinized over time, leading to the development of a clear set of responsibilities of each partner. This results in cooperation between members of both companies involved and in adaptations which either firm can make in the elements exchanged or the process of exchange.

B. Interacting Parts

Interaction between firms is inevitably affected by the characteristics of the organisations and individuals involved in a relationship. Describing a relationship might therefore include the consideration of the nature of each company's activities and strategies. Some of the variables describing the characteristics of the parties involved are presented below:

(i) *Technology*. Technical issues are critical in buyer-seller interactions and influence the interaction process (Håkansson, 1982). Actually, the basic conditions for interaction are given by the technological systems used by the two companies and the differences between them give the basic conditions for interaction. For example, the relationship between two companies with the same level of technical expertise is different from a relationship between two companies separated by different levels of technical expertise.

(ii) *Organizational size, structure, and strategy*. The size and the power of the parties give them basic positions from which to interact (Håkansson, 1982). With an increase in its size, the company is faced with new aspects like coordination and communication, new functions emerge and its structure is more formal, having more hierarchical levels. This means that a variation in companies' size generates modification of its structure. In general, a large firm with considerable resources has a greater possibility of dominating its customers or suppliers than a small firm has. The strategies of the parties are also important influencing variables on the relationships.

(iii) *Organizational experience*. According to Håkansson and Snehota (1995), the interaction capacity of an organization is a function of the knowledge, know-how and experience of its human resources. Also, experience can be the result of other similar

relationships and provides the company with knowledge about the management of these kinds of relationships.

(iv) *Individuals*. Interorganizational relationships involve personal level of interaction between the individuals representing each organization, who are characterised by personal motivation, different experiences and different personalities. Their reactions in individual episodes could condition the ways in which the overall relationship builds up. They exchange information, develop relationships and build up strong social bonds which influence the decisions of each company in the business relationship. That is because more than an economic exchange, a relationship is also a social interaction process (Ford, 1980; Hakansson, 1982).

C. Environment

The interaction between a buying and selling firm cannot be analysed in isolation, but must be considered in a wider context, – the interaction environment. The environment is usually characterised by several aspects like market structure, dynamism, internationalisation, supply chain position and social system.

D. Atmosphere

Atmosphere represents the state of a relationship (Ford et al., 1996) and its overall climate. The IMP work describes the concept of atmosphere in terms of the power-dependence relationship between buyers and sellers, the state of conflict or co-operation, overall closeness or distance of the relationship, and the mutual expectations between the parties (Hakansson, 1982). Young and Wilkinson (1997) consider that a central aspect of the idea of atmosphere is the cooperative and competitive norms of the firms involved which include trust and opportunism. The atmosphere is shaped by the ongoing patterns of interactions taking place in a particular environmental context together with their associated outcomes.

(i) *Power/Dependency*. The concept of power can be defined as one party's capacity to influence the other party's actions, forcing it to take actions that otherwise would not do by itself (Anderson and Weitz, 1987; Sutton-Braddy, 2000). According to the cited authors, it

is not the utilization of power that determines the course of action, but primordially it is the knowledge of its existence that determines it. Power has played an important role in many theories of inter firm relationships. Johanson and Mohammed (1991) argue that the degree of dependency between parties is the aspect that determines their power. Dependency can result from numerous factors like: product availability and necessity, alternative sources, etc.

(ii) *Cooperation / Conflict*. All inter-company relationships simultaneously exhibit conflict and cooperation (Ford, 2002). Cooperation is defined by Hallén (1991) as an attitude directed towards working together, demonstrating the party's willingness to accomplish common objectives (Sutton-Brady, 2000). On the other hand the author describes competition as the lack of willingness towards working together to accomplish common goals or common benefits, which sometimes can generate conflict (Hallén, 1991). Cooperativeness and competitiveness do not necessarily represent opposites but can coexist in various combinations in a relationship as parties cooperate with respect to some issues and compete over others.

(iii) *Proximity / Distance*. Proximity was defined by Nielson (1998) as the degree to which personal contacts as well as professional relationships are established between the personnel of each company. According to Ford (1984), one of the conditions that guarantee the success of a relationship is the degree of closeness established between the companies. Feelings of personal friendship and social and cultural identity are important factors which characterize the relationship. In the same time, different types of distances between companies can exist. However distances can be bridged by a willingness to understand and to be understood by the other party. Ford (1980) classifies distance into five dimensions:

- *Social distance* refers to the lack of familiarity with the working processes of the parties involved felt by the individuals and organization;
- *Cultural distance* refers to the difference in values, norms and work procedures coming from the different backgrounds where each company comes from.
- *Technological distance* refers to the technological differences characterizing products and processes.

- *Temporal distance* represents the time period between the moment when the contact was established and the moment when the product was delivered.
- *Geographical distance* refers to the physical distance between the facilities of the companies that interact.

(iv) *Expectations*. Expectations are a function of the promises of each party, referring to future behaviour and influenced by past experience in terms of exchange relationship and interaction (Hedaa, 1993). As a result, the behaviour of one party is conditioned by the future performance expectations of the other part. Expectations are being modified according to the good or bad experiences in past interaction episodes.

E. Institutionalisation / Cooperation

Halinen (1996) considers institutionalisation as a dimension of the coordination process and refers to the emergence of various rules, customs, and standard operating procedures in a business relationship. Other researchers use the term “cooperation” instead of coordination for similar activities. This is reflected by Young and Wilkinson (1997) who describe collaboration as activity undertaken jointly or in collaboration with others which is directed towards common interests or achieving rewards. All these activities and actions are strengthened by high degrees of trust and commitment (Anderson et al., 1997).

F. Adaptations

Inter-firm relationships inevitably necessitate a match between the two companies, demonstrated by adjustments made by both parties in terms of resources or operations (Hallen et al 1991). This means their willingness make adaptations in practices, policies, processes or behaviours, as circumstances change, to meet the specific needs of one organization. Ford (1990) suggests that inter-firm adaptations are investments which are relationship specific and are very much related to the concept of commitment. The presence of adaptation between buyers and sellers indicates the existence of a strong relationship, high levels of adaptation being consistent with high levels of relationship quality.

In the light of all these variables, there are reasons for the buying and selling organisation to both develop a high degree of closeness with their counterpart as well as to avoid such closeness, according to each party's objectives and interests.

The new business environment and the new technologies provide tremendous leverage for business partners to increase their effectiveness and efficiency. The buyer supplier interaction model will be the frame used to understand the increasing impact of the Internet and e-business tools on buyer and supplier activities and decision making efforts. The internet becomes therefore a crucial element for optimising the relationship between the parties and all the business processes involved.

3.2.2. Industrial Network Model

This chapter intends to present relevant theory regarding business networks, around the research tradition of the IMP Group concerning industrial networks, henceforth called the network approach. The IMP group's fundamental new insight was the idea that different actors are interdependent, their relationships evolve over time and different actors make adaptations creating long-term exchange relationships (Turnbull, Ford & Cunningham, 1996).

The relationships between business partners in a B2B environment are by their nature very complex. The network approach, as a theoretical extension of the interaction approach, aims at describing what happens in complicated business markets in which organizations are engaged.

The network approach on interorganizational exchange refers to a description of markets as associated or bonded structures which comprise not only buyers and sellers, but also other relevant organizations which are involved up to a certain point, such as consultants and governmental institutions (Easton, 1992). At the same time several researchers have linked competitiveness to a company's capabilities "to develop and manage its array of network relationships" (Turnbull, Ford & Cunningham 1996, 46).

In the light of Möller & Wilson (1995), network theory offers tools for analysing both structural and process characteristics of industries with the aim to understand complex systems of relationships. The structural and process characteristics can be viewed at different levels: the industry level, the level of firm in industry, the level of the firm as a connection of business exchange relationships, and the relationship level.

Håkansson & Snehota (1989) point out that the network approach takes into consideration the relationships between different actors. All the actors, their activities, and resources are bonded, linked, and tied up together, and in this way they build up a wide network. Contrary to the traditional perspective, the network approach suggests that the effectiveness of the organisation is a result of how it relates to the context and not of how it adapts. Consequently, while adapting leads to a focus on the internal processes of the organisation, relating induces a change in focus to its context, because the distinctive capabilities of an organisation are acquired and developed through the organisation's relationships with the other actors in the surrounding network (Håkansson & Snehota 1989). In order to understand the functionality of networks, it is important to understand also the individual relationships between organisations.

The basic model of industrial networks serving as basic theoretical ground is the Actors–Resources–Activities (ARA) model. The basic idea of this model is that every organisation is embedded in a network of relationships with other actors. Each actor is a part of a larger actor network. Furthermore, actors are attached to the overall network through these relationships. As a result, these three layers, are interrelated, making up the ARA model, first developed by Håkansson & Johanson (1992).

- **Actors** are organisations, or groups of organisations that control activities and/or resources, interconnected into activity chains and activity networks. Between actors are developed relationships through exchange processes based on interaction. They determine, alone or jointly, which activities to perform and how the resources of the network are used. Actors may control resources directly (ownership) or indirectly (through relationships with other actors). Actors have interests and goals that sometimes conflict.

- **Activities** occur when actors utilize, develop, combine, exchange or create resources. Activities can be divided into transformation and transfer activities. To perform activities, actors need to control resources and, as a consequence, the resources are interrelated.
- **Resources** are heterogeneous and can be used in an unlimited number of ways. They can be divided into tangible and intangible resources. Performing transformation activities requires transformation resources and performing transfer activities requires transfer resources.

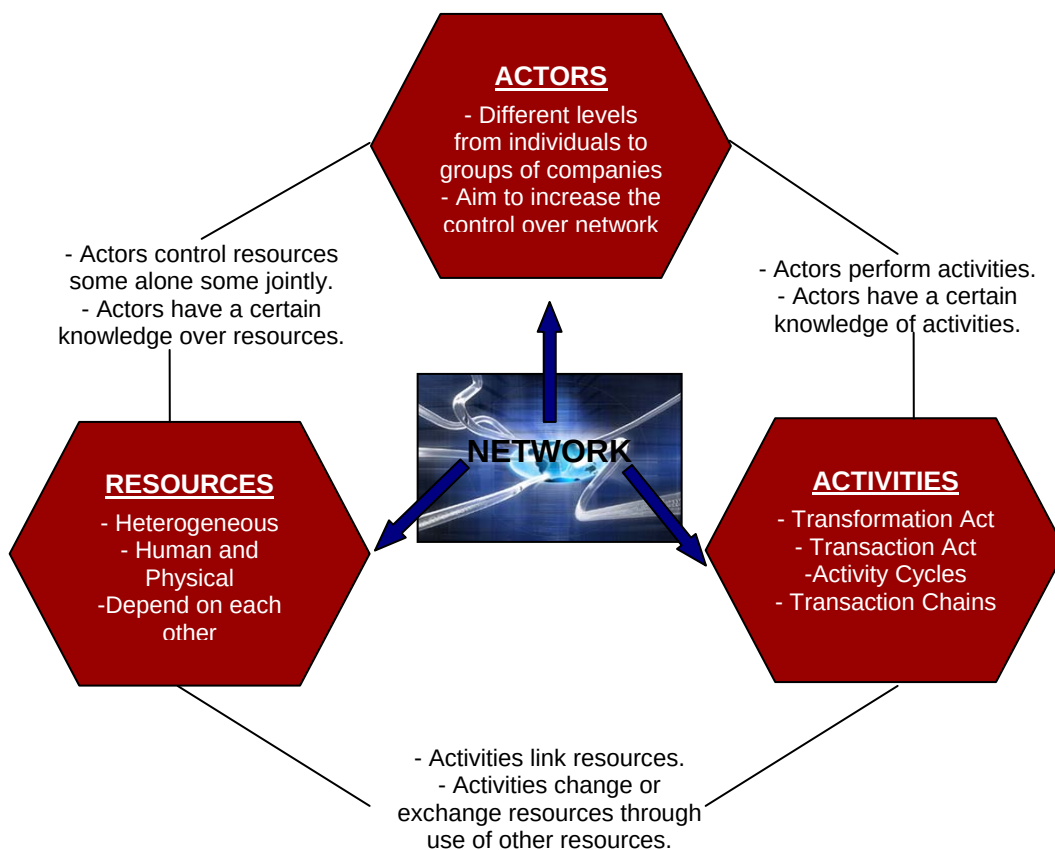


Figure 9: The A-R-A model of industrial networks – adapted

(Source: Håkansson & Snehota 1995, p.48)

Håkansson & Snehota (1995) developed the model presented above for industrial networks in a practical and dynamic direction. They elaborated it by describing network development as a dynamic entity that is made up by actor bonds, activity links, and resource ties. All these are connected to a wider web of actors, activity patterns and resource constellations

comprising the business network. Below, the actor bonds, activity links, and resource ties are each discussed in more detail.

A. Activity inks

Activity links refer to the connections among operations that are carried out within and between firms in networks and how mutual adaptations in activities take place between partners through the interaction process (Håkansson & Johanson 1992). They vary according to the type of relationship but some examples are: joint technical activities, joint commercial activities through electronic data interchange, etc. It is important for the overall network that new activities and changes in the old ones can make the overall network more effective. As a consequence, network changes occur through activity changes. Furthermore, activity links can be seen as forming broader entities of activity chains, in which the activities carried out by a single actor are based on the activities that have been carried out by another actor (Håkansson & Snehota, 1995).

B. Resource ties

Activities demand resources. The basis for the interdependence of companies in business relationships is the resources which they possess. Typical features of resources are their heterogeneity and the control possessed over them by the actors in the network. Companies interact with each other and develop relationships in order to exploit and develop their resources (Turnbull and Wilson, 1989). As a result, they seek those companies which have matching resources. According to Turnbull et al. (1996), resources can be viewed from three perspectives:

- **Financial resources.** Affect a company's ability to acquire new resources, or to use the resources of others.
- **A company's network position.** Network position consists of the company's relationships and the rights and obligations which go with them. Network position is both an outcome of past relationship strategy and a resource for future strategy.

- **The skills which companies possess.** These skills can be understood as a set of technologies which companies possess: product technologies (ability to design products or services), process technologies (ability to manufacture or produce these products or services) and marketing technologies (abilities to manage the relationships themselves).

Control and availability of resources are important factors in the network, as those actors with more control over resources will have a greater degree of power over the other actors within the network. Consequently, a common target for all actors is to increase their own power and influence in the network. Actors believe that more powerful positions within the network render them able to achieve other objectives. It is also important to mention that the relationship itself can be a very important resource too (Håkansson & Johanson, 1992).

C. Actor bonds

Actor bonds connect actors together and refer to the ways individual and collective actors perceive and respond to each other, both professionally and socially. These bonds happen over time and are mutually adapted through the knowledge and experience gained in interaction. The interaction process allows actors to create perceptions of each other and to develop an identity (Håkansson & Snehota, 1995), which involves relational variables, such as trust and commitment. Perceptions will also include an understanding of the other actors' capabilities and limitations, and through these perceptions actors develop the ability to communicate and relate to other actors within the network. Bonds include the closeness-distance, degree of commitment, power-dependence, degree of cooperation and conflict and trust among relationship partners. (Håkansson & Snehota, 1995)

The ARA model and its dynamic application involving the actor bonds, resource ties, and activity links form the core of the network approach. By applying it, it is possible to study inter-organisational exchange from a holistic perspective. The model is going to be applied later in the study, in order to understand the impact that an electronic marketplace has had in the construction industry, from the value creating networks perspective.

3.2.3. Collaborative Networks – The Collective Action Perspective

This section intends to present the changes brought to the industrial network model by the current views on the dynamics of industrial networks. In an article published by Brito (2001), the author focuses on the institutional role played by collective action processes, like groups of actors aiming to promote or defend their mutual interests.

The foundation of the literature regarding collective rationality is based on Olson's (1965) book, 'The logic of Collective Action' which conceptualises the collective action and tries to encourage people to cooperate on a collective basis. A first discovery of Olsen is that as the groups become larger, individual contributions to the collective action tend to be greater than the perceived returns of the contribution, which becomes more difficult to ascertain. This research encompasses some key issues that can contribute to the construction of a model of change in industrial networks.

The first two models presented earlier (interaction and ARA model) study business markets in terms of the nature of buyer-supplier relationships and the embeddedness of these in industrial networks, modelled as inter-connected actors, activities, and resources. Although the ties and bonds amongst actors favour the establishment of stable links, industrial networks can be regarded as "living" structures where the way in which actors interact, exchange resources and develop activities is continuously changing. The reasons for change are very much related to the dynamics of the economic process as well as to the movements of actors attempting to increase their control over resources, activities and/or other actors. (Brito, 2001).

The view of collective action is based on the interaction between companies as well as between companies and other organisms like governmental, consultancy, which are acting in a constantly evolving environment, trying to keep the pace with the changes in technologies, processes, as well the know how. By acting inside a network, each company tries to create a position for itself, use resources and make use of its relationships, in order to accomplish its goals.

The collective action theory uses this type of actor: “the collective actor” which is the net of relationships created in order to cope with a collectively perceived or shared issue. This view encompasses both vertical relationships (between suppliers and customers) along the manufacturing and distribution channel as well as horizontal relationships among competitors.

As presented by Brito (1999), a collective actor is an issue-based net. An issue-based net constitutes a form of association mainly based on cooperative relationships amongst actors who aim to cope with a collectively recognised issue by influencing the structure and evolution of the system to which they belong. This is made through an increased control over activities, resources and/or other actors. An issue-based net may aggregate mutual interests of various types of actors through processes of interaction and exchange. In the view of Brito (1999) the term “network” refers to the overall network of relations in a particular industry and the term “net” refers to a subset of the overall network. This outlook over the two terms will be also assumed in this thesis.

Collective actors are characterised by a number of features presented below (Bruto, 2001):

- Can adopt both formal structures (like trade associations, consortia of firms for joint sourcing, etc) and informal structures (like virtual nets of relationships without any kind of formal organisational structure supporting them).
- Consist of nets of relationships that support the formulation of internal rules, the making of decisions, and the implementation and execution of their actions.
- The strength of a collective actor depends on its capacity to collectively interpret issues, align interests, intervene or, quite often, interrupt others’ interventions.
- Collective actors may not survive for long periods of time, especially if they have an informal nature.
- They constitute vehicles for aggregating, aligning and mobilising interests as well as pushing change in a particular direction for a period of time.

- Collective actors are sometimes set up simply to address the resolution of a specific problem and as soon as the problem is resolved, their existence is no longer justified.

Within the context of collective actors, cooperation, complementarities and coordination must be perceived always in the context of groups of actors and not just at the dyadic level (Brito, 2001). That is because, collective actors affect not only the organization of individual actors and their strategies, but also the structure of relationships and the balance of power within industrial networks, playing a key role in shaping the “rules of the game” and the structure of the network.

The existence of collective actors and the relationships established around them, introduce a new relational dimension to the traditional network approach model: the “institutional relationship” in a three-dimensional approach (Brito, 2001). As it was stated before, cooperation, complementarities and coordination must be perceived in the context of groups of actors (nets).

The collective network is made out of the industrial network presented below in figure 10 in its two-dimensional form. Above it, collective actors, in a formal or informal aggregation unify their actions in a consistent manner in order to achieve common interests. They can be described as nets of relationships created in order to cope with a particular issue (or set of issues) concerning a group of actors. (Brito, 2001). This means that the immediate objective of a collective actor is to provide a product or service to its membership, and/or to directly influence other actors’ activities.

According to this model, network changes are likely to be the product of a series of equilibrium and disequilibria, which result from the interdependence among three components of the system (Brito, 2001): (1) the distribution of power between individual actors; (2) the distribution of power between their respective representative bodies; (3) and the interaction process involving both individual and collective actors.

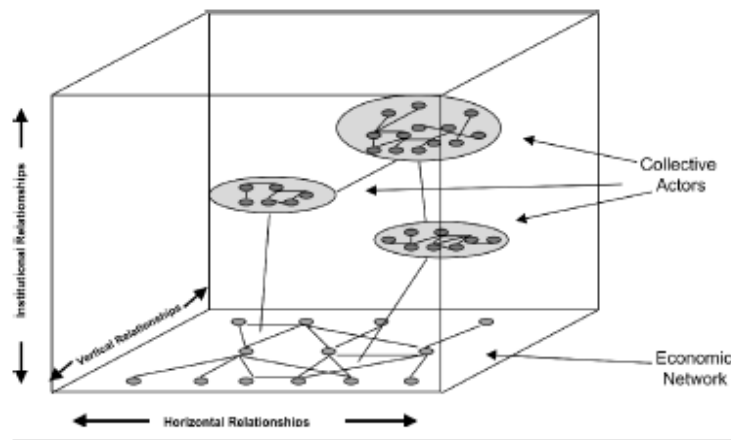


Figure 10: The three dimensional model of industrial networks
(Source: Brito, p. 157)

It is also important to mention that companies are changing the structure of the industrial networks and are progressing into electronically-connected networks that share information, execute transactions and collaborate on plans via electronic marketplaces or trade exchanges in an environment of constant change. By sharing activities within such trade exchanges and operating as though they were one organization, synchronized to meet consumer demand, such collaborative communities strive to discover significant cost savings and service enhancements (Tapscott et al. 2000).

The digital networked economy enables enterprises to transform themselves into adaptable networks or collective actors. The rise of B2B e-commerce has significantly accelerated the businesses' ability to integrate more easily and more often with other businesses for collaboration and cooperation. Companies find themselves as participants in a collective actor's arena (Tapscott et al. 2000).

3.3. The Strategic Impact Of The Internet

As presented in Chapter 1, the new information economy represents one of the most fundamental changes in the new environment, with huge opportunities for all people and businesses. ICTs allow for new forms of partnership between companies, suppliers and consumers, improving the way they work as well as the products and services they offer. Electronic commerce as a general concept covers any form of business transaction that is

conducted electronically, using telecommunications and computer networks. Such transactions occur between companies, between companies and their customers, or between companies and public administration (Hennyeyová, 2004).

The Internet is a flexible technology, able to connect a wide array of people, organizations, hardware and software over any communications platform, from telephone lines to satellite systems. As a result, the Internet can be considered the physical medium that provides the base for certain services. It is how interesting these services prove to be that will indicate the true value of the network. Interaction between buyers and sellers occurs through computers on networks, so that individuals and organisations can communicate directly with one another regardless of location or time. The development of the web means that the network in which a company operates is extended far beyond the companies in its immediate vicinity, or its current suppliers and customers, to a global network of real and virtual companies and relationships (Ford et al., 2002).

Interpersonal contacts are a very important part in the development of successful business relationships. However, due to certain advantages of Internet communication, numbers of relationships start to relay increasingly on this impersonal way of communication. Therefore, there is a need to study what roles Internet communication could and could not serve for in business relationships. The increased complexity of business relationships in the context of cost pressures and time pressures (Ford et al., 2002) led companies to discover that sooner or later they will have to become e-businesses. They see dramatic improvements in productivity and in the ability to provide customized products and services. They can also respond more quickly to the market and to meet consumers' needs (Jarvenpaa and Tiller, 2000).

Considering the increase in IT investments over the past years, we should consider what makes companies still invest so much in the ICT and what do they expect from it. Brynjolfsson & Hitt (2000), for instance, suggest that firms invest in IT motivated by tangible benefits like cost reductions and increasing in productivity levels, as well as for obtaining more intangible benefits in connectivity, product and service quality, convenience, variety and speed.

The insights from a recent exploratory survey realised by Ordanini (2003) reveal the benefits which motivate companies to use ICT in the interaction process. Participation in a B2B exchange has a multi-faceted impact on companies that can be aggregated in three main groups:

A. Negotiation Effects, Based On The Well-Known Transaction Cost Hypothesis

The marketplace on the web is far more transparent than the traditional marketplace, making it easier for buyers and sellers to search, meet, compare prices and negotiate. The web reduces the costs of individual transactions and the distance between buyers and sellers and because of this, the barriers to entry are reduced so that smaller companies can operate within a complex network (Ford et al., 2002). The reducing of these costs is very much related to the transaction cost theory. According to Williamson (1981), the transaction cost theory regards the transaction as the basic unit of analysis and the internal and external transactions that a firm carries out must be governed and give rise to costs, according to the firm's organization and its relationship with other firms. Transaction cost theory argues that companies will adopt the way of working that minimizes their transaction costs. According to Ford (2002) transaction costs can be of two types:

- Coordination costs. They are the costs associated with the coordination of producers and customers, like: costs of searching for buyers and sellers, learning about each other, interacting, adapting, building a relationship, negotiating, comparing and deciding.
- Motivation costs. They are costs associated with managing a relationship and include: continuing costs of informing, interacting and building commitment and trust, and also the costs of monitoring and remedying problems in relationships.

The use of an e-marketplace for the management of buyer-seller relationships has some typical negotiation effects, which work differently according to the nature of the participant (Ordanini, 2003). For sellers, the negotiation effects mean the possibility of finding new customers and increasing sales, leading to market expansion. In this case, digital marketplaces make it easier to find new customers and new distribution channels, enforcing

the market positioning of participants. For buyers, negotiation effects mean an increase in the number of suppliers, and savings on purchasing costs. It is basically an improvement in the bargaining power of participants, which may benefit from increased competition in the supply market.

B. Efficiency Effects, Based On The Streamlining Of Internal Processes

The efficiency effect relies on the automation of processes. In other words, beyond market transactions, internal activities can also be handled more effectively through B2B exchanges. The dimensions explaining this factor are: reduction of administrative costs, time optimisation, and improved quality of processes.

The web has the ability to dramatically enhance the range of market interactions on the basis of removing the possible limitations to communication originated in time and space restrictions and diminishes the time people spend in the regular monitoring of operational data exchange improved communication, coordination, community and creativity (Ford et al., 2002). Companies have more time to concentrate on cooperative activities (Bensaou 1997) and technology becomes the interface option.

C. Partnership Effects, Through The Exploitation Of Strategic Opportunities Along With The Value Chain

Another impact of the digitisation is called the partnership effect. This effect offers the possibility of sharing information, knowledge and know-how, learning from other's experience. Since communication is an important factor for successful relationships, B2B e-marketplaces intensify existing relationships by improving communications between the parties' involved (Oppel et al., 2001) and facilitating collaboration between companies. For example, a virtual community of interests may realize such an effect.

Secondly, there is a general effect on value chain opportunities, which can be achieved through cooperative projects and long-term collaboration with other players. Supply-chain management practices are an example, since integration along with the supply-chain may be better achieved through cross-enterprise activities.

Besides the effects presented above, any firm, as it will be presented in the next section, has a portfolio of different relationships and is important to see how e-commerce affects this portfolio. On the one hand, in the case of highly standardized products bought sporadically, e-commerce will be used to find available suppliers, obtain a better price, and reduce the resources allocated to the transaction. Furthermore, e-commerce will act as a substitute for other interface options. On the other hand, in the case of strategic suppliers, the firm will use e-commerce to fortify the relationship and increase joint action. As a result, e-commerce will act as an additional interface option between partners. Electronic linkages will allow the partners to develop an electronic interdependence with an extensive useful information exchange (Bensaou and Venkatraman 1995). This gives partners the possibility to act more as a unified chain than as separate units.

Summarizing what was said above, in the case of transactional exchanges, the purpose of e-commerce is exclusively to reduce costs. Information exchanges are reduced to an exchange of data useful to the transaction and there are not social exchanges engaged between partners. On the contrary, when exchanges are part of a buyer-supplier relationship, the purpose of e-commerce is not only to support the transaction but also to fortify the relationship. As a result, e-commerce is used to facilitate social and information exchanges oriented to increase mutual knowledge between partners.

This section intended to show that e-commerce adapts according to the type of relationship, diminishing the necessity to make relational investments, while, in the same time, has the power to strengthen relationships and increase joint action between partners.

3.4. E-Business In A Dyadic Perspective

“Electronic commerce has added a whole new dimension to discussions of business relationships.” (Morgan and Hunt, 2003) The evolution of purchasing from simply a buying function to a strategic business function has received considerable discussion in the academic literature. There are many industries that use purchasing portfolio models for their purchasing function on the buyer side as well as differentiating models according to the importance of their customer, on the supplier side. This section will try to present the

benefits of differentiation between importance attributed both to purchases and use of purchasing portfolio models, as well as to a company's customers, as a management tool for buyer-supplier relationships. All of these will be combined with the advantages of using e-business tools.

E-business and implicitly e-marketplaces affect suppliers, buyers, and their relationships in B2B context. By analysing the effects as a dyadic confrontation, the applicability of e-business tools can be assessed. This section will try to bring into the spotlight the use of e-business tools both from buyer as well as supplier perspective in a B2B environment. According to the American Marketing Association, a dyadic relationship is a relationship between two interacting and mutually influencing organizational entities. Most buyer-seller relationships in organizational marketing are dyadic.

Although e-business has had some ups and downs, passing through its typical developmental stages, nowadays it is becoming a normalised instrument for improving cost efficiency and effectiveness in B2B sales and procurement processes.

The research employed by Santema (2003) within the IMP Group and the Scenter for E-Marketing and Procurement (SEMP) has simplified the supply chain into a set of dyads. According to the dyadic perspective, one will recognise both sides of the coin: the supplier wants to increase sales (or margin) according to his relationship management programmes and the buyer wants to buy according his purchasing formulas. These both sides of the coin represent the foundation of two perspectives: supplier and respectively buyer perspective, described using two metaphors:

- As a metaphor for the supplier perspective a common Customer Relationship Management (CRM) pyramid (Curry & Curry 2000) can be used.
- As a metaphor for the buyer perspective the widely adopted Kraljic (1983) matrix (Supply Chain Management or purchasing portfolio) can be used.

The two metaphors can be matched in an Interaction Relationship Model, where each interaction results in different implications for the relationship and the adoption of e-business tools.

A. Supplier Perspective - the CRM Approach: Customer Pyramid

Santema (2003) used the customer pyramid as a metaphor for the CRM approach. It can be used in order to understand the customers' needs at different levels of profitability and adjust products and services based on those differences (Zeithamal et al., 2001). This is a critical issue because of the costs associated to every customer in a firm's portfolio and respectively related revenue aspects. Firms can use the customer pyramid to determine optimal allocation of scarce resources, thereby, capturing more value from levels of buyers, resulting in higher overall customer profitability.

E-tools can help firms to identify and exploit their position with their buyers. Araujo et al. (1999) conclude that, from the perspective of the buyer, interfaces with suppliers should be carefully differentiated. Sales organisations (suppliers) should, from their own perspective, manage different interfaces or interactions with different types of customers (or customer groups). In other words, buyers and sellers should interact according to the value of the relationship for both of them.

E-tools can have a massive effect in the allocation of time and resources according to the value of the relationship, helping managers to pay more attention to account profitability, buyer selection and management. The customer pyramid in figure 8 is used as a metaphor for the CRM approach.

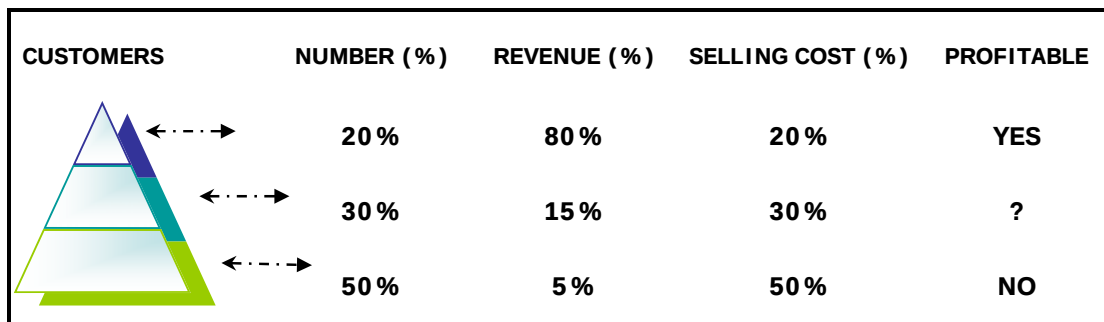


Figure 11: The customer Pyramid

(Adapted from Santema, 2003, Curry & Curry 2000)

Virtually all firms are aware at some level that their customers differ in profitability, in particular that a minority of their customers accounts for the highest proportion of sales or profit ("80/20 rule"):

- Based on the Pareto principle, the pyramid indicates that 20% of the customers represents 80% of the revenue and incurs only 20% of the selling cost. Therefore these customers are profitable.
- On the contrary, small customers (50% of the customer base) are attached to a large portion of the costs and therefore might be less valuable.

Improvement schemes have the objective to move customers up the pyramid. From this perspective, e-business tools can be used as a sales force assistant or an extension of the sales force. The rationalisation of the customers might make the sales force more effective. According to Hise & Reid (1994) studies on the sales force show that only 35% of the time of sales representatives is dedicated to face-to-face contacts. E-business could make the non face-to-face time of sales representatives more efficient.

On the other hand, e-business could reduce the costs of interaction, resulting in lower costs per customer contact (Santema, 2003). This can turn serving small customers more feasible. It is important to underline that the differences in cost per interaction should compensate for the investments that have to be made in e-tools in terms of hardware and software, and organisational transformation. A low cost solution can in this case be represented by e-marketplaces, which do not necessitate significant investments in terms of hardware and software. In general, a normal computer and an Internet connection are sufficient in order to accede to the platform therefore, the costs are low.

B. Buyer Perspective - The Supply Chain Management (SCM) Approach: Purchasing Portfolio

There are many purchasing models in the academic literature (Campbell 1985; Olsen & Ellram 1997; Spekman 1998; Virolainen 1998). Empirical evidence indicates that firms can indeed obtain competitive advantage by managing supplier relations (e.g., Dyer 1996, Chen,

Paulraj and Lado 2004). The central idea in the purchasing models is a differentiation of suppliers. Differentiation is needed in managing supplier relationships, since not all suppliers are to be dealt within the same way. The need for differentiated supplier relationships requires some sort of classification (Lilliecreutz and Ydreskog, 1999). Portfolio models provide differentiated strategic actions (Turnbull, 1990).

The purchasing portfolio model introduced by Kraljic (1983) is the first comprehensive portfolio approach and is used in this thesis as the metaphor for purchasing behaviour. Kraljic designed the model in order to help managers with the changing economic and technological dynamics. Kraljic's message was that "purchasing must become supply management".

The model consists of two dimensions: the financial risk (or profit impact) and the complexity of supply (purchasing risk) that classify a firm's purchased items into four categories. Both dimensions can be either 'low' or 'high', thus creating a two-by-two model with the following product categories: routine, leverage, strategic, and bottleneck products. The purchasing portfolio is shown in Figure 9.

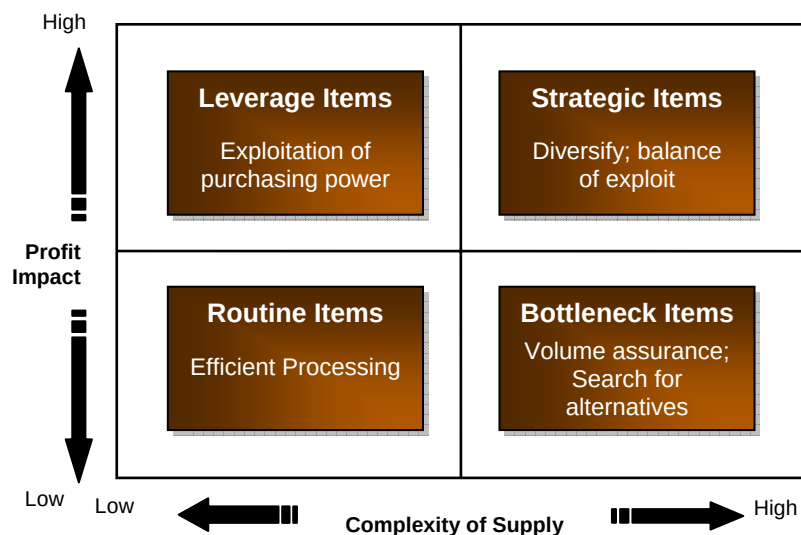


Figure 12: The Purchasing Portfolio
(Adapted from Kraljic, 1983)

Each of the four categories requires a distinctive approach toward supplier management (Gelderman and Van Weele, 2005). *Leverage items* allow the buying company to exploit its

full purchasing power, for instance through tendering, target pricing and product substitution. *Routine items* are of low value, are ordered frequently and therefore cause high transaction costs. Therefore, strategies are aimed at reducing transaction costs through category management in e-procurement solutions. *Bottleneck items* cause significant problems and risks that should be handled by volume insurance, supplier control, safety stock and backup plans. In some cases, a search for alternative suppliers or products is needed. *Strategic items* require a more collaborative strategy between both the buyer and the seller. The general idea of Kraljic's model is to minimize supply risk and make the most of buying power.

Two items can describe the complexity of supply: the number of suppliers and product specificity. Starting with the *number of suppliers*, a low complexity of supply can be caused by a reasonable amount of alternative suppliers. On the other hand, this means a competitive situation for the suppliers. High product specificity or only a limited number of suppliers could raise the supply risk.

In relation to the *product type*, commodities are differentiated only by price, quality and delivery criteria (Roberts & Mackay 1997) and do not require substantial after-sales service. In this case, there is no need of a strong buyer-seller relationship in order for these products to be successfully traded on e-marketplaces. They are perfectly suitable to be traded on a B2B e-marketplace without special relational focus. On the other hand, customized products, require a relational electronic marketplace setting, since they need conversation for product specification (Campbell 2000, p. 390). They are not only price-driven but the fit between supplier's offer and customer's problem is essential.

The profit impact of the same products can differ per organisation. In general, investment and production goods will have a higher profit impact than non-production related products. From a purchasing perspective, every segment is characterized by different goals; as a result, the electronic tools (like e-marketplaces) will be used according to the objectives as presented in the table below:

SEGMENT	OBJECTIVES	E-TOOLS WHICH CAN BE USED
ROUTINE	Reducing the cost of the purchasing processes.	Catalogues E-marketplaces
LEVERAGE	Reduction of product prices.	Auctions E-marketplaces
STRATEGIC	Establishing or developing relationsh. with suppliers.	ERP integration
BOTTLENECK	Supply security.	Web-relationships

Table 4: E-procurement goals and examples

(Source: Adapted from Santema 2003, p. 7)

When matching the supplier and buyer perspectives it is important to determine the characteristics of the interaction and consequently the way a relationship could be established and in which way e-tools can be applied.

From this perspective, electronic procurement tools are valued both by seller and buyer in every relationship (Santema & Rijt, 2003). They are valuable for:

- Large customers buying leverage products, and thus obtaining a reduction in prices.
- Small customers buying strategic products and therefore developing relationships.
- Suppliers when they are dealing with small customers, accounting only for a small percentage in the income, therefore reducing interaction costs.
- Customers buying routine products, reducing therefore the cost of the purchasing process.

3.5. The Notion Of “CO-OPETITION” And E-Business Success

One of the most appropriate terms describing what currently happens between companies in the new business environment and close related to the success of e-business is a new topic in strategic management described as co-opetition. It is referred to as simultaneous cooperation and competition between companies (Brandenburger, 1996). Until now,

academic research has viewed cooperation and competition as two distinct fields. In competition, the focus is on rent appropriation strategies whereas in cooperation, the focus is on collective strategies for rent generation (Lado, 1997).

First of all, it is important to present the terms of competition and cooperation in order to get a better inside of the term of co-opetition. There are many definitions of competition and competitors. In a narrow approach, some authors define it as actors that produce and market the same products (Bengtsson, 2000). Brandenburger and Nalebuff apply a broader definition of competition describing it as conflicting interests between companies. This perspective will see almost any interaction between different companies as having an element of competition.

The collaborative perspective views the business world as a network of strategic interdependence among firms pursuing convergent interests and deriving mutual benefits. The collaborative perspective made the transition from the transactional to the relational marketing approach to study inter-firm relationships, and was studied intensively in the work of Håkansson. According to the relational paradigm, the market becomes a system of interactive and continuous relationships. This strengthens the reciprocal commitments between firms and puts into practice a process of mutual adaptation and joint value creation. Inter-firm relationships are viewed as strategic assets.

Following the realities of the new business environment and trying to adapt to them, the two traditional perspectives on competition and cooperation have evolved into new concepts. The new electronic business economy has been a catalyst for the development of “co-opetitive” relationships experienced by a growing number of companies. The following quote captures the essence: “creating value, a bigger pie, is fundamentally a cooperative activity involving customers and suppliers that a company can’t accomplish alone. On the other hand, the act of dividing up the pie is fundamentally competitive. A company has to keep its eyes on both balls and creating and capturing at the same time. We have chosen to call this “co-opetition” because it combines competition and cooperation.” (Brandenburger and Nalebuff, 1997).

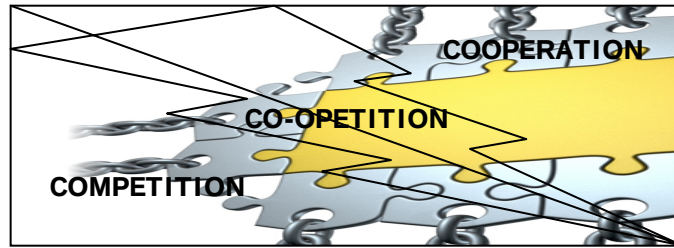


Figure 13: CO-OPETITION: A blurred line between competition and cooperation
(Source: Own elaboration)

Limited resources have led to new cooperation forms in many industries, achieving economies of scale and/or synergy effects. There are potential benefits in cooperating with competitors, like access to new markets, new distributors and access to valuable information, knowledge and competence.

The co-opetitive perspective rises from the acknowledgment that, within inter-firm interdependence, both processes of value creation and value sharing take place, giving rise to partially convergent interests where both competitive and cooperative issues are simultaneously present and interconnected. It is an alternative way to behave in the business arena.

Co-opetitive relationships can be quite multifaceted. The decision to cooperate with competitors is generally motivated by different reasons or different types of situations, like:

- For example two general contractors can make a consortium in order to make a project and in the same time compete for other different projects.
- Many SMEs are in co-opetitive relationships with major partners. Small companies dependent on a dominating partner will face the challenge of compliance versus securing own interests in the partnership. This situation represents competition and cooperation simultaneously.

Therefore, it is important for companies to assess the appropriate content and levels of cooperation and competition in relationships with business partners. The co-opetition perspective recognizes the need for more complex descriptions of markets and business models where cooperation and competition merge together, and the actors' roles, processes and objectives become more complex.

3.6. Final Remarks

This chapter started by presenting the main interaction models within the IMP group that characterize B2B interaction. The continuous transformation of the business environment has led to changes in the way in which companies interact. Different situations require different approaches.

The main objective of the chapter was to point out some of the major changes that are occurring in business marketing, many of these depending on a greater availability of information which requires a more efficient management. The importance of information, leads to greater value given to the web as a device for accessing and transmitting information. But a closer look to the ICT using the Internet, takes us beyond a view of a simply source of transmitting and exchanging information. As it was portrayed by Ford et al., (2002), a closer look shows that the Internet and e-business tools are revolutionizing the business networks, enabling the creation and development of companies with an almost infinite range of network positions and relationship behaviour, without constraints.

Part Two – Research Design

Chapter 4: Conceptualisation And Framework For Analysis

*“Method is much, technique is much but
inspiration is even more.”
(Benjamin Cardozo)*



Taking into consideration the main research objective of this thesis – to understand the impact and dynamics of e-marketplaces, this chapter will contain the framework for analysis derived from the research questions approached by this project. In other words, in this chapter we explain the issues that will be examined.

Therefore, the objective is to propose a frame of reference which will be the basis of the study presented in the following chapters. The first section makes a conceptualisation of the literature presented which serves as the frame of reference for answering the research questions. The second section presents the research questions. In order to explore them, three dimensions of analysis were chosen and they are presented in the third section. Finally, section 4.4 presents the model whose application within the frame of a case study will make up the empirical component of this thesis.

4.1. Conceptualisation And Operationalisation

The purpose of a conceptualisation is to explain the main areas of a study either graphically or narrative (Miles & Huberman, 1994). The first part of this thesis provided an overview of the literature that is relevant for this study. The purpose of this chapter is to conceptualise the literature presented in the previous chapters and to explain how the literature relates to each of the research questions. This will make it possible to answer the research questions. The conceptualisation translates into the frame of reference that represents the foundation for collecting and analysing the data.

The perspective chosen to orientate the study of the phenomenon will have an important impact on its understanding. “Any object or phenomenon is many different things, dependent on the angle chosen to approach it and explore it, and can be approached from different angles. Different perspectives result in different pictures of the landscape where different features of it appear or disappear and assume major or minor proportions. Perspectives always entail “distortions” of the phenomena, but then again no picture can embrace all perspective and any picture always implies a certain point of observation.” (Snehota 2003, p. 2)

The theories that were selected from the literature review are presented below. All chosen authors bring up issues that are relevant for the study. Further on we will present a brief and concise revision of the literature, with the intention to trace the path which will lead to an analysis perspective of the research questions.

The first chapter introduces a concept which characterizes more and more what happens nowadays in the new business environment that is called the new Internet economy. This concept has evolved accordingly to the transformation of the business environment, enabling companies to operate in a more complex and dynamic setting. The term that intrinsically accompanies the new Internet economy is “virtual”, which describes a new reality in a networked environment where everything is connected with everything, with unlimited capacity to accommodate connections and relationships. In order to adapt themselves to the new reality, many companies are already advanced users of ICT.

The emergence of B2B e-Marketplaces marks a radical change in the evolution of buyer-supplier relationships. In just a few short years, industry structures are being completely redefined. The first chapter describes in detail the characteristics and business dimensions of e-marketplaces. E-Marketplaces are all about industry transformation and collaboration across the value chain and extended services. In order to be successful, they must deliver value to all participants, both buyers and sellers.

Baker (2000) elaborated a model which groups the major benefits of electronic marketplaces into three clusters: process improvements, cost reductions and new business

generation. These three clusters represent the three directions in which the impact of econstroi.com e-marketplace at firm level will be analysed.

As the frame of analysis of this study is represented by the construction industry, we found it very important to dedicate an entire chapter (chapter 2) to the description of the procurement process, since the purchase function is of strategic importance in this sector and procurement costs represent a large percentage of the overall costs.

The main objective of the above mentioned chapter is to understand the procurement activities. The purchase situation as detailed in the second chapter brings insight into its main dimensions such as product, market, supplier and relationship characteristics (Hartman et. al. 2001). Based on this position, the buyer has to develop the appropriate strategy for optimising the relationship with its supplier. Each purchase situation is different; therefore, the buyer has to adopt the most suited purchase strategy.

Based on these circumstances, in the end of the chapter we made the transition towards the new trends in procurement envisioned by e-procurement strategies and the adaptation of ICT to the purchasing function. As a result, the B2B e-marketplace concept has to be adapted to the particular realities of the buyer and supplier side in order to generate the most of the benefits that can be achieved.

Electronic markets have been for some time the object of study as they are in the present research. Besides the reasons for e-marketplace participation (the benefits of joining or the possible consequences of not joining), the e-marketplaces have an effect on existing buyer-supplier relationships which will be also investigated. This paper tries to contribute to understanding these effects.

In chapter 3, we presented three relevant buyer-supplier interaction models that are going to be used in the empirical part. The three models represent the work and research of the IMP Group. The models chosen are appropriate for understanding the dynamics and impact that econstroi.com as an e-marketplace can generate at buyer-supplier relationship level as well as industry level. Empirical models of buyer supplier relationships complement each other

in terms of the relationship dimensions considered. With this purpose, the three models are presented as follows:

- a. *The Buyer Supplier Interaction Model* (Håkansson, 1982) provides a very useful framework for a better understanding of the buyer-supplier relationships in industrial markets. The interaction model is generally focused on a two party relationship, a dyadic interaction on two levels: organizational and individual. The model will be used for a better understanding of the interaction process between buyers and sellers in the context of an e-marketplace.
- b. *The "Industrial Networks" Model* (Håkansson & Johanson, 1992) is based on the existence of a high degree of connectivity between businesses, giving origin to networks of business relationships. This model was used because the best influence e-business tools can have, lies in the redesign and reengineering of business processes, not just in one organisation but across many organizations. The industrial networks model is significant to study different dimensions of relationships, such as activity links, actor bonds and resource ties. In the case of business networks, an e-marketplace can be a good example of a technical bond that ties the businesses together and generates benefits for all participant members.
- c. *The "Collaborative Networks" Model* (Birto, 2001) is based on collective action theory, which uses a new type of actor: "the collective actor" which is the net of relationships created in order to cope with a collectively perceived or shared issue. This model will be used in order to understand the connectedness of business relationships and the way in which firms collaborate in order to achieve common goals. The model is important because we can use it to illustrate the digital networked economy that enables enterprises to transform themselves into adaptable networks or collective actors. The rise of B2B commerce has significantly accelerated the businesses' ability to integrate more easily with other businesses for collaboration and cooperation. Companies find themselves as participants in a collective actor's arena (Tapscott et al. 2000).

An important characteristic of today's business environment is the simultaneous presence of competition and collaboration between companies, defined by Bradenburger (1996) as co-

opetition. This feature broadens the area of analysis of buyer-supplier relationships and networks and offers new perspectives.

After the presentation of the three models, section 3.3 makes the connection between the ICTs and business relationships, underlining the role of the Internet as a strategic tool. Its utilisation has generated dramatic changes in the way in which businesses operate and interact. E-marketplaces affect suppliers, buyers, and their relationships in B2B context and it is important to see things from both perspectives. The development of the web means that the network in which a company operates is extended far beyond the companies in its immediate vicinity, or its current suppliers and customers, to a global network of real and virtual companies and relationships (Ford et al., 2002).

According to Ordanini (2003), participation in a B2B exchange has a multi-faceted impact on companies that can be aggregated into three main groups presented below. This will be one direction in which the buyer-supplier relationship impact of econstroi.com will be analysed:

- A. Negotiation effects, based on the well-known transaction cost hypothesis;
- B. Efficiency effects, based on the streamlining of internal processes;
- C. Partnership effects, through the exploitation of strategic opportunities along with the value chain.

The second direction will be represented by the relationship atmosphere in the interaction process between buyers and suppliers.

Finally, the section 3.4 provides more inside in the applicability of e-business tools at relationship level, and as a result, we can analyse their effects as a dyadic confrontation. The research employed by Santema (2003) provides a better perspective over the evolution of the buyer supplier relationship in the new business environment and provides insight in both sides: buyer and supplier side. According to the research, the supply chain was simplified into a set of dyads, in order to have a clearer picture of the nature of the relationships and see both sides of the coin: the supplier's perspective (wants to increase

sales or margin according to his relationship management programmes) and the buyer's perspective (wants to buy according his purchasing formulas). These two perspectives are described using two metaphors which can be matched in an Interaction Relationship Model, where each interaction results in different implications for relationship and the adoption of different e-business tools.

Based on academic literature, it is very important to point out that no business is an island, as this was demonstrated by Håkansson and Snehota (1989). In addition, between companies there is always a degree of interdependence in order to develop knowledge and abilities and generate value. This means that the actions of one actor will influence the other actors in the network.

Within this context, an e-marketplace can represent the platform for interaction between companies, offering assistance in better integrating their processes and opening new doors towards new business partners, since everybody is connected inside the network. When matching the supplier and buyer perspectives it is important to determine the characteristics of the interaction process, the possibilities for establishing relationships and the way in which e-tools can be applied.

4.2. Research Questions

On the basis of the literature review and taking into consideration the different theoretical perspectives we can present the central research objective:

- ❖ To understand the impact and dynamics of e-marketplaces.

The different impacts of e-business tools (in the present case an e-marketplace) will be studied at firm level, relationship level and industry level in the context of the interaction process between buyers and sellers in the construction industry. In other words, the thesis aims at better comprehending the effects and dynamics derived from the use of an e-marketplace at different levels of analysis. This can mean change:

- In processes and internal structure – at firm level in terms of value creating functions;
- In the relationship between the interacting parts, their attitudes and views, their degree of preparation and readiness, the changes in the interaction models and buyer-supplier relationship success;
- In an industry, in terms of alignment with the new technologies and the new modalities of doing business; in terms of change in the industry structure and change in the competitive arena; in terms of improvement in the actor's connectivity and improved network cooperation.

We can envision the changes generated by the e-marketplace as a chain reaction that starts from the inner most level - firm level with all its components - that is subsequently transmitted to the relationship level with changes in the way in which players interact and attribute a certain value to their relationship. This coupled effect will pass forward and as a consequence, will generate changes in the structure of the processes, the productivity levels and the benefits within any industry.

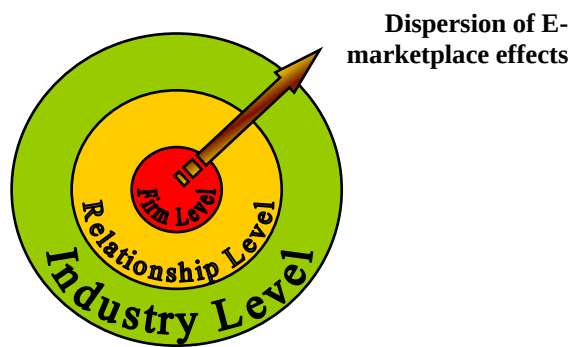


Figure 14: Dispersion of E-Marketplace effects
(Source: own elaboration)

In order to achieve the thesis's objectives, we will structure the analysis in more stages. A first stage will be to put into practice a conceptual model which will allow us to understand how buyers and sellers interact using ICTs, namely inside an e-marketplace arena. On the basis of the changes in interaction patterns driven by the use of an e-commerce tool, we will be able to understand the changes in the relationships between the business partners, the changes in the procurement processes, as well as the intrinsic changes at organization level.

In this manner we will be able to better understand what are the attitudes and views of the companies (here in the construction industry) regarding e-commerce, their motivation to use e-commerce tools, the change in the business patterns and as a result to extrapolate and understand the changes at industry level.

The broad objective of the thesis becomes in this manner possible to materialize, and will be translated into two research questions:

RESEARCH QUESTIONS

- 1 How and why do companies interact using the e-marketplace arena?
- 2 How can one best describe and analyse the effects of an e-marketplace in terms of benefits (value creation) for the participant members?

Table 5: Thesis' Research Questions

(Source: Own elaboration)

For a better understanding of the research questions, the figure below tries to make a representation of the research questions and to integrate them in the conceptual model.

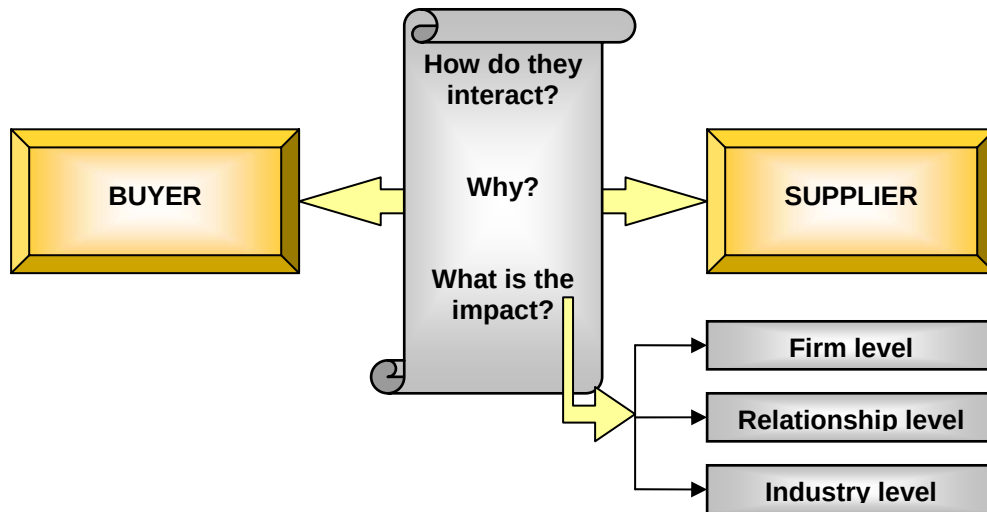


Figure 15: Framework for Analysis

(Source: Own elaboration)

The next section will present the dimensions of analysis which were considered as well as the frame of reference which will guide the development of the study.

4.3. Dimensions Of Analysis

This section points out the dimensions of analysis, which make up the investigation developed within the study. There are three dimensions that can also be called levels of analysis:

DIMENSIONS OF ANALYSIS	SUB-DIMENSIONS	KEY ISSUES
COMPANY LEVEL	1. Process Improvements 2. Cost Reductions 3. New Business Opportunities 4. Attitudes and Views	E-marketplaces seen as drivers of a series of <i>benefits</i> that can be grouped in: - Streamlining workflows and enhancing flexibility, - Purchase cost reductions and - New business generation.
BUYER-SUPPLIER RELATIONSHIP LEVEL	1. Relationship Success within e-marketplace context 2. The Atmosphere	Buyer-Supplier Interaction Process: capability to manage relationships under the influence of an e-marketplace. <i>Relationship Success</i> within e-marketplace context can be aggregated into <i>three main groups</i>: - Negotiation effects, based on the well-known transaction cost hypothesis. - Efficiency effects, based on the streamlining of internal processes. - Partnership effects, through the exploitation of strategic opportunities along with the value chain. <i>Relationship atmosphere</i> under the influence of e-marketplaces.
INDUSTRY LEVEL	1. From e-commerce to e-construction 2. Envision of the network 3. Collective Action Dynamics	The trend towards <i>e-construction</i>. Networks as configurations of inter-connected <i>actors, resources and activities</i>. Capability to understand networks, their structures, processes and evolution towards the new challenges of the business environment. <i>Firm's network behaviour</i> is related to: - Strategic projects (issue-based nets) where they belong to. - Positions and roles they play in these nets. - Major business relationships. Networks of firms as <i>collective actors</i>.

Table 6: Dimensions of Analysis

(Source: Own elaboration)

B2B e-marketplaces offer tools and processes, such as business rules, technology, transaction support, that help companies conduct business with other entities more effectively. The key terms, which define this new marketplace and distinguish it from the traditional one, are: efficiency and change. Efficiency can be regarded in terms of the reorganization and improvement of the internal processes and the result derives in changes at three levels: organizational, relational and industry. The change is the result of these processes.

This chapter summarizes the theoretical framework presented in the theoretical part of the thesis in order to analyse the main research questions. Analysing only one level of the impact would mean reducing the area of the study and as a result a reduced understanding of the impact of the econstrois.com project in the construction industry in Portugal.

COMPANY LEVEL

As a result of the theoretical framework, the impact of an e-commerce tool can be translated into many sources of business value, in terms of redefining the internal processes of a company and its improvement including direct savings.

The company level dimension of analysis will be based on the model developed by Baker (2001) which groups the major benefits of e-marketplaces into three clusters: process improvements, cost reductions and new business generation. These will represent the main areas of analysis of the company level impact and are presented in the figure below:

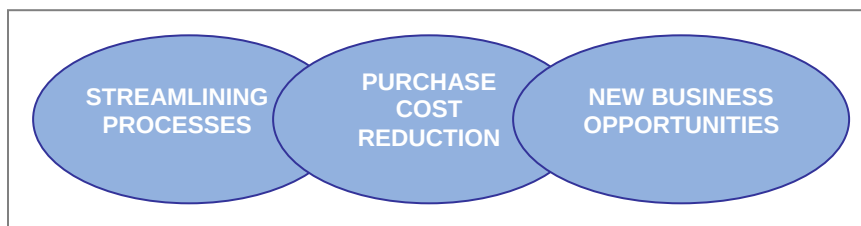


Figure 16: E-marketplace benefits

(Source: Baker, 2000, p. 105)

Often, innovative projects have a “teaching” character, helping firms realize that some activities could be performed in a better way. In the light of the concept of “radical innovation” (Leifer et al. 2001), we can say that the development and implementation of

econstroi.com as a B2B e-marketplace will have decisive impact on the day-to-day purchasing efforts, causing learning effects and new processes.

BUYER-SUPPLIER RELATIONSHIP LEVEL

The buyer-supplier relationship is the second dimension of analysis. In this case, the study will be performed in two phases. In a first phase will be analysed the relationship success within the context of an e-marketplace. This study is based on the research of Ordanini (2003) which reveals the benefits obtained by companies using ICT in the interaction process. Participation in a B2B exchange has a multi-faceted impact on companies that can be aggregated into three main groups. The figure below presents the effects that can be generated at relationship level by participating in electronic exchange:

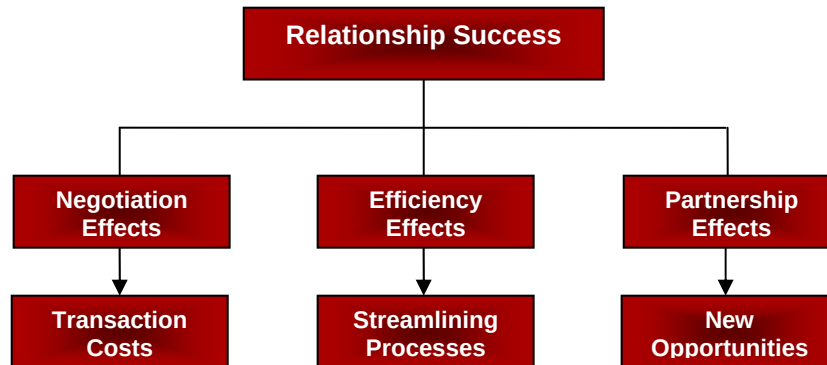


Figure 17: Relationship Success generated by an e-marketplace
(Source: Own elaboration)

In a second phase, the thesis will present the state of the buyer-supplier relationship by describing the atmosphere and the overall climate (Ford et al., 1996). The impact of an e-marketplace will be illustrated in terms of the power-dependence relationship between buyers and sellers, the state of conflict or co-operation, overall closeness or distance of the relationship, and the mutual expectations between the parties (Hakansson, 1982). Young and Wilkinson (1997) consider that a central aspect of the concept of atmosphere is the cooperative and competitive norms of the firms involved which include trust and opportunism. The atmosphere is shaped by the ongoing patterns of interactions taking place in a particular environmental context together with their associated outcomes.

INDUSTRY LEVEL

The last dimension of analysis takes place at industry level. As a result, we will analyse the impact of an e-marketplace envisioned as a network (Håkansson & Johanson, 1992) where actors, activities and resources are interrelated and interact on the common platform provided by the e-marketplace. The activities-resources-actors model and its dynamic application involving the actor bonds, resource ties, and activity links form the core of the network approach. By applying it in the context of an e-marketplace, we will be able to study inter-organisational electronic exchange and interaction from a holistic perspective.

Taking into consideration the fact that the business environment is in a continuous change and industrial networks can be regarded as “living” structures where the patterns of interaction between the actors are continuously evolving, we will use the collective action theory in order to illustrate the transition towards e-construction. The reasons for change are very much related to the dynamics of the economic process, as well as to the movements of actors attempting to increase their control over resources, activities and/or other actors. (Brito, 2001). The collaborative networks model (Birto, 2001) is based on collective action theory, which uses a new type of actor: “the collective actor” which is the net of relationships created in order to cope with a collectively perceived or shared issue. This model applies very well to the construction industry and is important because we can use it to illustrate the digital networked economy that enables enterprises to transform themselves into adaptable networks or collective actors (see figure 18).

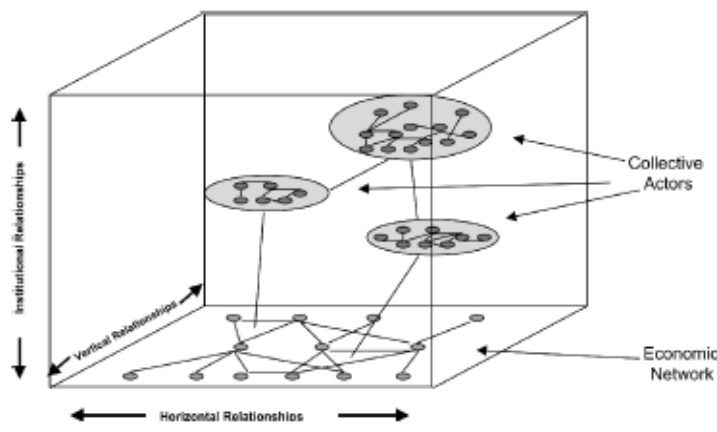


Figure 18: The three dimensional model of industrial networks
(Source: Brito, p. 157)

4.4. Emerged Frame Of Reference

For reducing complexity, the theoretical framework is divided into three levels of analysis displayed in figure 19.

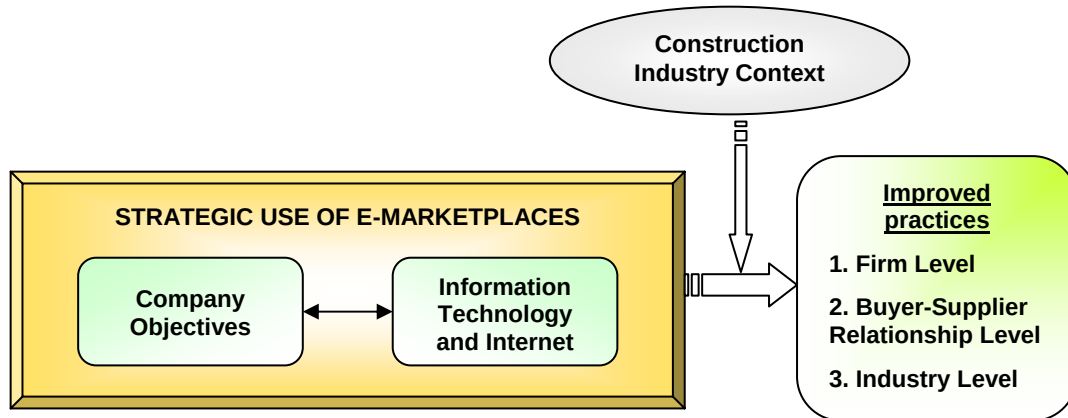


Figure 19: Emerged frame of reference: impact of econstroï.com in the construction industry

(Source: Own elaboration)

As it can be seen in the above figure, at the core of the study is based on the connection between a company's objectives and business goals (seen from both perspectives: buyer and seller) and ICT solutions, in this case an e-marketplace. This means that companies place strategic meaning on the use of information technology in order to obtain competitive advantage. Within the context of the construction industry, the strategic use of e-commerce tools translate into improved practices at three levels: company level, relationship level and industry level.

4.5. Final Remarks

The literature review that was presented in the previous chapters is adequate for the purpose of the thesis and for answering the research questions. This chapter represented a theoretical review that led to the preparation of the research question and the construction of the frame of reference.

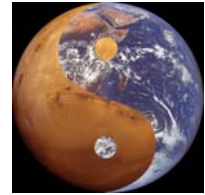
Within this setting, there is a question that has to be answered: Up to what point, the use of an e-marketplace is a win-win situation for both parties involved: buyers and suppliers? Based on this observation, that the use of an e-marketplace has to generate benefits for all

participant members, the emerged model intends to determine the impacts at three levels of analysis: company level, buyer-supplier relationship level and industry level. These three levels of analysis can provide a holistic picture over the complex phenomena regarding the emergence of the new Internet economy. The approach is analytically both deep and broad: deep at a micro level – covering the impact of the Internet at company level; and broad up to a macro level – embracing the impact of Internet technology and an e-marketplace in the construction industry.

In order to use a conceptual frame of reference in an empirical analysis, the next chapter will present the methodology chosen to be used in the investigation. The research methodology has to be properly justified in order to make possible the empirical study developed in the next chapters.

Chapter 5: Research Methodology

*“As the path of the birds in the air or of fishes in the water is invisible, even so is the path of the possessors of wisdom”.
(Buddhist quote)*



In this chapter, the empirical research design of the study is discussed. The chapter starts with a presentation of the research project (section 1.1.) which intends to point out the objectives of the research project, its content and context as well as the constraints associated. The second section starts with a presentation of the methodological choices made in the study by discussing qualitative research methods and case study strategy. It provides argumentation for the use of these approaches. Furthermore the selection of the empirical case, the data gathering process, and the data analysis process are discussed.

5.1. The Research Project

A method is a tool, a way to solve a problem and reach new knowledge (Holme and Solvang, 1997). The next step after identifying the research questions involves the selection of the overall methodological choices. The methodological choices give us guidelines for how we should gather information for our research and the tools to investigate. This makes possible to receive appropriate answers to the research questions and draw valuable conclusions. According to Brito (1996), the determinants of the methodological choices and research methodology are: the research objectives, the content and context of the investigation project and the potential constraints.

5.1.1. Research Objectives

The research project aims at discovering the impact and dynamics generated by an e-marketplace. Within this setting, we will investigate the impact of econstrois.com e-marketplace in the Portuguese construction industry, taking into consideration three levels of analysis: company level, buyer-supplier relationship level and industry level.

The decision to study the construction industry in the context of the utilisation of an e-marketplace was made for a series of reasons: the importance of the construction industry for the economy, the dimension of the e-marketplace and its diffusion in almost all regions of the country, the possibilities to study different patterns of interaction between buyers and sellers leading to different outcomes for the participant members.

It is frequently claimed that “the research questions is probably the most important step to be taken in a research study” (Yin, 1994, p.7), therefore they should be very well prepared and developed from relevant literature. The theoretical objective of the thesis can be materialized in two operational research questions that are essential for the investigation.

1. How and why do companies interact using the e-marketplace arena?
2. How can one best describe and analyse the effects of an e-marketplace in terms of benefits (value creation) for the participant members?

According to Yin (1994) the research questions that focus on “how” and “why” are explanatory and are likely to lead to the use of case studies, histories and experiments as preferred research strategies. This is because “...such questions deal with operational links needing to be traced over time, rather than mere frequency or incidence.” (Yin 1989, p. 18).

Furthermore, the methodological choices were not solely influenced by the way the research questions were expressed, but also by their content. The definition of the research questions specified not only the kind of data to look for, but also the kind of actors to approach (Brito, 1996). As a result, the research questions had important sampling implications. First, the content of the research questions focused on a limited number of specific issues, which influenced the data collection. Data collection was influenced by issues like: changes in business practices, changes in business relationships and changes in industrial systems. Second, the research questions had obvious sampling implications since they determined, to some extent, the kind of actors to take into consideration: buyers and sellers in the construction industry as being part of a collective network defined by mutual interests.

5.1.2. Content And Context Of The Research Project

The second major determinant of methodology and research methods had to do with the content and context of the study. For many authors, the content of the research projects represents the most important determinant in considering the methodological choices, since it assumes a high degree of significance in this field. The content of the present research project has three dimensions of analysis that show strong connections between them, respectively: the strategic impact of the Internet and what it means for a company, what it means for business relationships taking into consideration the inter-organisational interaction, and what it means for an industry as a whole. The framework for analysis is mainly based on the Buyer-Supplier Interaction Model (Håkansson, 1982) and the "Industrial Networks" Model (Håkansson & Johanson, 1992).

The role of context for the case study analysis, in order to find the underlying mechanisms that shape the methodological choices has been emphasized by Pettigrew. Pettigrew (1997, p. 338) talks about "...a sequence of individual and collective events, actions, and activities unfolding over time in context." The author argues that the context is involved in producing action, that the context can be mobilized by key actors as they seek strategic outcomes important to them. This leads to the context of the present study in which the investigation process takes place. The context is represented by the interaction process between the actors in the construction industry. The interorganizational interaction process can be further integrated in a broader context represented by industrial networks. As a result it is important for the investigation to study all the aspects related to industrial networks that might influence the strategy of the investigation and the methodological choices.

Easton (1995) brings important insight in this area, by considering the most significant characteristics in the study of industrial networks that influence and determine the methodological choices: connectivity, interdisciplinarity, complexity and the importance of time factor. These characteristics are presented below:

Connectivity. The underlying concept defining industrial networks is connectivity. The e-marketplace can be visualised as a network where each participant in the e-marketplace is

connected to all other participants. The connections between the actors are very strong and they are part of one global network. However, this option raises a major difficulty: studying a single large network is in most cases impossible or, at least, extremely difficult (Brito, 1996). These are the reasons why network studies have usually adopted smaller sampling units such as focal organisations, dyads or small nets. Taking into consideration the three dimensions of the analysis, the choice of the sampling unit for the study was the outcome of a trade-off between those three dimensions. On the one hand, the analysis of the impact of an e-marketplace at company level allowed the use of focal firm perspective to delimit the cases. On the other hand, the collective character of the research problem conduced to the adoption of the issue-based net – i.e. a net of relationships amongst actors who are concerned with a particular issue through mutual or conflicting interests (Brito, 1996).

Interdisciplinary. The industrial network definition encompasses various disciplines strongly related in this case to the technological, economical, political and social areas. This clearly defines the inter-disciplinary characteristic of the issue at hand. From the beginning it becomes fundamental to clarify in methodological terms what is the type of knowledge that is intended to be achieved in order to make the proper methodological choices that best define the research project. In this particular investigation, the research object is strongly related to the technological, economical as well as social areas.

Complexity. The industrial network itself is composed of a multitude of relationships between business partners characterised by a number of factors like: relationship closeness or distance, the interests and objectives of both parties involved, different degrees of commitment and trust, different objectives that business partners have concerning what they want to get out of the relationship. All these factors and the connectedness of the actors, increase even more the dimension of analysis of the industrial network, achieving a considerable level of complexity. This results in the necessity to select the matters and circumstances that are going to be investigated in the context of the network. The path that is going to be followed will involve a more profound and detailed analysis which will condition the adequate choice of the actors that are going to be analysed.

The importance of the time factor. The role of time is crucial and is one of the things highlighted by Halinen and Törnroos (1995) as a challenge in studying business networks. The authors argue: “networks are changing in relation to the value that they create and the problems that they aim at solving over time” (Halinen and Törnroos, 1995, p 4). The concept of time gives the analysis a dynamic character by encompassing the past, present, and future dimensions. Also, the role of time is crucial in understanding the dynamics of value and value creation, since what is considered value is changing over time, depending on the context and the actors involved. As a result, the dynamic character of time associated to the interaction process, influences the methodological choices. As a result, the methodological choices will also be conditioned by this factor.

5.1.3. Constraints

In the development of any research project, there are some limitations, as it is underlined by Easton (1995). The author presents the limitations as being of a technical or technological nature and they can relate to available time for conducting the research, knowledge, creativity, existent research and academic literature in the area, as well as the investigator’s capacity. All these factors can lead to certain methodological choices.

The perspective taken in the research is subjectivist, meaning that the story told is a created by the researcher. Moreover this means that the value concept attached to the use of an e-marketplace for conducting businesses is seen as something subjective, since the parameters for value are different in different contexts. Human beings are the ones who set the parameters and who make the judgment on whether something is of value for them or not.

One of the most important constraints of the investigation process relate to time and the limits imposed by it: is a critical issue for both the researcher as well as for the persons interviewed for the thesis. Due to this fact, the author intended to make a dynamic illustration of the evolution of the construction industry towards e-construction, with illustrations in the changes in business practices.

Finally, another difficulty encountered relates to the complexity of the subject and its multi-disciplinary character, which conducted to the presentation of the investigation from different perspectives.

5.2. Research Approach

This study has been carried out by using qualitative research methods. The choice of qualitative methods is derived from the study's purpose of building an empirically model for understanding the change driven by the adoption of an e-marketplace designed for the construction industry at company level, relationship level and industry level. From this point of view, the preference for qualitative methods is normal, since these are the most suitable research methods when the objectives of the study demand in-depth insights with the aim to understand the target phenomenon. Furthermore, as the present study deals with network approach and collective action, a holistic perspective is more appropriate, which leads once more to the choice of qualitative methods.

A case study can be conducted by both quantitative and qualitative means. In this research, the empirical study is carried out as a case study by qualitative means. However, some quantitative means are used in order to show some of the monetary impacts of the use of the e-marketplace. According to Eisenhardt (1989), the case study method is well suited to new research areas, since it is good method when new perspectives are sought or when there is little knowledge available about the phenomenon under study. A case study is also a very suitable research strategy when the focus is on understanding the dynamic nature of the phenomena studied, as it is here with the emergent concept of e-construction generated by e-marketplace adoption in the construction industry. In addition, it is a recommended method when the emphasis is on answering "how" and "why" questions, when the researcher has little control over events, and when the focus is on a phenomenon in its real-life context (Yin 1994).

Indeed, the research questions of the study are "how" and "why" questions, as they were formulated: *How and why do companies interact using the e-marketplace arena?* and *How*

can one best describe and analyse the effects of an e-marketplace in terms of benefits (value creation) for the participant members?

Regarding the modalities for conducting the case study, Yin (1994) proposes four alternatives: single-case study or a multiple-case study and both of these can employ a single unit/level of analysis (i.e., a holistic case study design) or multiple units/levels of analysis (i.e., an embedded case study design). This study represents a single-case study with multiple levels of analysis. The research process is affected and influenced by the insights that I gained during the research process and also the experience and insights that I have gained through my work as a consultant at Vortal S.A. These experiences should be seen as a part of the research process.

The network connections generated by econstroi.com e-marketplace in the construction industry represent a complex phenomenon, and as a result, the use of the case study as research method will allow a thorough and holistic analysis of the phenomenon. Moreover, when selecting a case study method, it is also important to determine the level of analysis used throughout the case (Yin 1994). This study has more than one level of analysis for the case. As it was pointed out in chapter four, the case study consists of three interrelated levels of analysis, company level, relationship level and network level. In order to show the impact of the e-marketplace, was decided to start from the smaller unit of analysis, the focal company and go all the way to illustrate the connectedness that is the very essence of a network.

In this study, the selected case did seem to work well during the research process, as there were no problems involving access to the needed information and the findings from the secondary and primary data supported each other.

5.3. Research Strategy

This section deals with the research strategy which was used during the investigation process.

5.3.1. Case Selection

The case study is represented by econstroi.com e-marketplace designed for the Portuguese construction industry. In order to describe and analyse the effects of an e-marketplace in terms of benefits for the participant members, there were three stages of specification. In the steps taken for making the selection, the following criteria were applied: the ability to maximise what can be learned through the case, accessibility, and acceptable practical limits on carrying out the case study – e.g., time limits (Stake 1995).

The objective of the case study is to illustrate the impact generated by the e-marketplace in the construction industry. For this reason, companies that use the e-marketplace have been selected to illustrate with their own example how econstroi.com changed their business processes and how it influenced the relationship with their business partners. When choosing the companies to be studied (representing buyers and sellers), the main criteria was to look for a case where the phenomenon (the use of econstroi) would most likely be found. The logic was that this would make the study as rich and interesting as possible: “...the underlying principle that is common to all case selection strategies is selecting information-rich cases; that is, cases worthy of in-depth study.” (Perry, 1998, p. 181).

The case study is carried out in three interrelated parts, the first representing the focal company level of analysis in the form of a more detailed analysis of the implications in the business processes, the second representing the buyer-supplier relationship level in the form of the interaction process mediated by the e-marketplace and the third is the macro level of analysis, in the form of the network generated by the e-marketplace (see table 7). In the case of the focal buyer and seller relationship, there is a stated interest from both parties to develop business interaction into what is referred to as streamlining business processes, a better integration between them, possible cost reductions and better collaboration.

Regarding the accessibility of the companies, the buyers, suppliers as well as Vortal’s consultants were accessible to the researcher. This main reason for this accessibility is an internship that the researcher concluded at Vortal S.A. Additionally, Vortal S.A. provided all the information required to efficiently conduct the research.

Case Selection Steps	What was chosen?	Why it was chosen?
1 st STEP: To select some relevant buying and supplying companies that can provide relevant insight over the effects of the use of the e-marketplace.	Relevant buying and supplying companies using econstroi.com. A presentation of Mota Engil (buyer) and Gondepac (supplier) case studies (impact of econstroi.com)	Representative companies, demonstrating good practices of econstroi.com utilisation Good representatives in terms of buying and a supplying construction companies as well as utilisation practices.
2 nd STEP: To select particular dyads to study the relationship effect generated by the e-marketplace.	Relevant buying and supplying companies using econstroi.com.	Companies that have a business relationship and continue to develop it by using econstroi.com as platform for interaction
3 rd STEP: To view the network generated by the e-marketplace and to select a specific issue based net to be studied in more detail.	A relevant buying company with some of its suppliers.	Utilisation of Internet technology was a critical issue in the buying company. The buying company interacts with enough suppliers to provide a relevant example. High level of accessibility to the company and its suppliers.

Table 7: Steps that were taken in case selection

The study is conducted from the perspective of both buying and supplying companies using econstroi.com as well as from the perspective of the company that administrates the e-marketplace in order to portray a holistic and multifaceted perspective over the phenomenon and its implications. In summary, the utilisation of three different but mutually supportive levels of analysis was chosen to ensure in-depth and thorough analysis of the research phenomenon.

5.3.2. Data Collection

This section will describe the different types of data collection techniques used throughout the investigation process. According to Patton (1987), in-depth and thorough analysis involves actions like: approaching the research phenomenon from different angles, using different levels of analysis and taking advantage of multiple sources of evidence. In the present study, the most important source of evidence is represented by the interviews, but

other sources of evidence come into play as well. These include the project meetings, company documents, and all the secondary data collected during the research.

The research was based both on primary as well as secondary data. The primary data was collected through interviews and for this purpose representatives from buying and supplying companies, as well as Vortal's consultants were interviewed. And secondary data was collected from additional and secondary sources like Internet, National Statistics Institute, websites, econstroi.com material, etc.

According to Yin (1994) there are six sources of evidence for conducting case studies: documentation, archival records, interviews, direct observations, participant observations and physical artefacts. The figure below (figure 20) illustrates the empirical material gathered in the study.

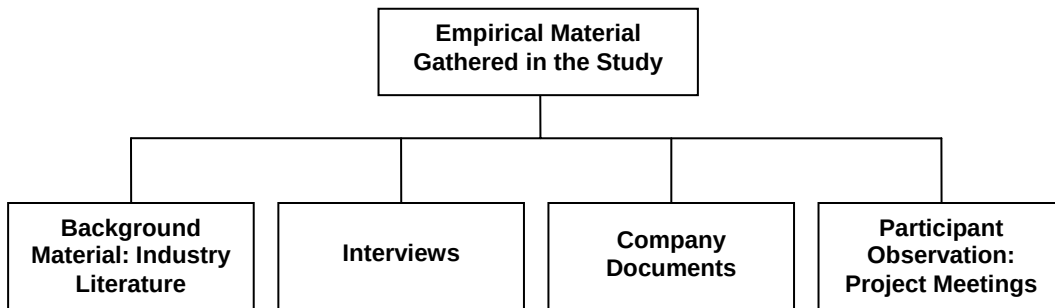


Figure 20: Illustration of the empirical material gathered for the study

(Source: own elaboration)

A. The background material is represented by a broad review of construction industry related literature, news and statistics that was mainly gathered via the Internet. The main objective of the background material was to: (a) find general information about the construction sector and present it in a holistic manner; (b) find information about the business processes, practices and traditions, including business networks; (c) find information about ICT, companies, products, technologies in order to better understand the process; (d) to find information about e-marketplace platforms. Additionally, the background material includes the researcher's own experience as a consultant at Vortal S.A. The purpose of the background material was to familiarise the researcher with the industrial

setting and help formulate the themes and questions for the interviews. A list of the sources used as background material is provided in Appendix A.

B. Interviews represent the most important part of the empirical material for the present study. According to Yin (1994), one of the most important sources of case study information is the interview. As a result, one of the modalities for gathering data for qualitative methods is represented by semi-structured interviews, which are usually very discussion-oriented. This is the way in which the interviews for the present study were carried out. The nature of the questions did suit more conversational interviews in order for the interviewer to be able to ask the respondents to further explain their answers. Broader themes were utilised in order to cover from different perspectives the phenomenon under investigation. The interview themes/questions are provided in Appendix B.

C. Documents are likely to be relevant to every case study and can take many forms (Yin, 1994). Documents that are related to the companies studied were also used as empirical material. These documents include annual reports, companies' diagnosis studies, reports, various kinds of commercial and technical material related to the e-marketplace, administrative documents, newspapers and newsletters, formal studies and evaluations. Additionally, a survey conducted by the Institute for Marketing and Research investigating the degree of satisfaction of Vortal's customers was used in the industry analysis. Also, very important for the study was the existence of a series of case studies conducted by Vortal, portraying a series of success stories regarding the utilisation and benefits of the e-marketplace for its customers. The stories represent statements of the interviewed company's managers regarding e-marketplace utilisation backed with relevant reports.

D. Participant Observation. According to Yin (1994), participant observation provides unusual opportunities for collecting case study data. The most distinctive opportunity as being one of Vortal's consultants is the ability to gain access to events or groups that are otherwise inaccessible. Another distinctive opportunity was the ability to perceive the reality from the viewpoint of someone "inside" the case study rather than producing an accurate portrayal of a case study phenomenon. It is worth mentioning the possibility to call a meeting of a group or to call a meeting with a person and easy phone access to the target

interviewees. During the meetings which acted as important information sources, occurred fruitful discussions among the researcher and company representatives.

The important amount of empirical data transformed the data collection into a very time-consuming phase of the study (meetings, interviews, documentation). Most of the interviews were conducted in the form of face-to-face interviews in order to achieve a discussion atmosphere. There were also telephonic interviews. The way in which interviews were conducted is presented below.

First of all, an important part of the process of conducting the interviews was the development of the research themes. This was done by becoming familiar with the literature addressing buyer-supplier relationship, procurement process, network literature as well as relevant construction industry literature. Instead of set interview questions, broad themes were used during the interviews.

The interviews were unstructured in nature and the questions were broad. The themes that were addressed to suppliers, buyers, Vortal's consultants involved past and present experience, future expectations, business practices that would lead the interviewee to talk about relationships, benefits obtained from e-commerce participation. The themes that were used during the interviews varied between the macro network perspective, to the company perspective. The aim of the interviews was to discuss the relationship between the buyer and the supplier, the interaction between them and the status of the relationship at that time. Moreover the interviews concentrated on discussing perceptions of benefits from e-marketplace participation. Each interview contributed to a more holistic understanding of the phenomenon under study. The interview themes are provided in Appendix B.

Before conducting the interviews I had to choose the interviewees. A very important part of the interviews conducted are with consultants and administrators from Vortal S.A. There was total availability on their behalf to provide all the necessary information and the interviews were conducted in a less formal manner. Besides Vortal's consultants, I aimed to choose interviewees representing both buying and supplying companies. There were many companies interviewed, the interviews many times represented semi-structured interviews.

Companies were selected based on their utilisation practices of the e-marketplace and also their relevancy in the construction industry. The interviewees were selected so as to give a holistic and multifaceted a view of the construction industry. The companies that were selected for interviews varied in terms of their size, independence or business area.

5.3.3. Methods Of Analysis

According to Gummesson (2001), whenever possible, the analysis of a case should be explicitly systematic; however, when studying complex and ambiguous phenomena, like the ones that are studied in marketing often are, intuition plays a vital part and is in fact required “as it often is impossible to know exactly how to process data and arrive to conclusions” (Gummerson, 2001, p 33). The research, as well as the final analysis, relies in the end on the researcher’s ability to expose the case study, to tell the story and make the proper connections with the literature addressed. The final results depend on how well the researcher is able to reveal and communicate complexity, to present the story, as well as to involve himself in the work. In other words, “what we observe is not nature itself, but nature exposed to our method of questioning” (Gummesson 2001, p 40).

When using qualitative methods, data collection and analysis are often done simultaneously as it was done in the present study also. As it is confirmed by Strauss and Corbin (1990), a case study is not just qualitative investigation, but it can be in the same time *a mix of qualitative and quantitative evidence*. The amount of collected data basically assumes a qualitative nature, but it is important to mention the existence of quantitative data in the support of the qualitative findings. The quantitative data embrace the form of reports, utilisation analysis and real life economic indicators that were extracted from actual utilisation of the e-marketplace.

The case analysis embraced the form of a final report with an in-depth analysis which applied the frame of reference to the present case. Both primary and secondary data were used. A case study research in the context of business networks was an appropriate strategy which allowed presenting the complexities and dynamics of business markets. In studying the buyer seller relationships within the context of ICT, an attempt was made to provide a

thorough description of the reality. The core arguments in the study are that the business environment is changing at a rapid pace and business actors have to adapt to the new realities. Those who adapt can take advantage of the benefits of technology and can gain competitive advantage.

Given all these things, the role of past, present and future are of core importance throughout the whole study. The capture of these aspects has been done throughout telling the story, i.e. describing and analysing the case of the buyer-supplier relationship. Mainly, the description of the development of the relationship and more specifically in digging deeper into the benefits and sacrifices of being involved in a relationship powered by ICT.

Throughout the analysis, a very important attempt was to highlight events, activities and implications on individual firm, on relationship, on network and industry level to understand how things have evolved over time and in this way to build a coherent story that supports the conclusions made in the end. In addition to studying the process of how the relationship has evolved and developed, the focus of the study was to identify what are the benefits brought by ICT and the Internet.

5.4. Final Remarks

This chapter specified the methodology required to fulfil the purpose of the study and deal with the research problem, based on the background information provided in the theoretical chapters.

The chapter, after a brief introduction, began with further discussion about the research project: research objectives, content and context of the study and its constraints. It was argued that a qualitative research approach fits this study supported by quantitative facts and information. The research approach that best fits this thesis is the case study method.

Part Three – Empirical Investigation

Chapter 6: Overview Of The Construction Industry In Portugal

*“The road to success is always
under construction.”
(Lily Tomlin)*



This chapter intends to describe the construction industry with its main characteristics and specificities with the purpose of further integrating the econstrois.com e-marketplace within this frame. The “key word” of the present thesis is “change” illustrated in different approaches: mentality, business processes, internal processes, relationships, collaboration, competition and so on. The main idea is that a change that has had an enormous impact on the construction industry is taking place.

The objective of this chapter is to describe the Portuguese construction industry. The chapter is divided in four sections as follows: the first section (6.1) makes a description of the construction industry with its basic characteristics; the second section (6.2) presents the traits of the procurement process. The next two sections deal with the applicability of e-tools in this sector (6.3) and the current penetration of ICT (6.4).

6.1. Construction Industry In Portugal

This thesis’ definition of “construction industry” encloses architectural, engineering, construction, operation and maintenance activities and all other connected activities, products or services.

It is recognized that construction industry has been slower than other industries with the adoption of innovation. Still relying on a paper-intensive exchange of information, construction industry has invested less than the other sectors in ICT and training. E-commerce offers a unique opportunity to increase efficiency levels and reduce costs throughout the whole industry. But the Internet also presents a great challenge. It is not the

technology that creates competitive advantage, but the ability of the organisation to quickly implement this new way of working and overcome internal resistance to change.

Construction is the world's largest industry, accounting approximately for 4.500 billion Euros in annual investments (Engineering News-Record, 2004). In Portugal, construction accounts for 50% of gross fixed investment, 6.8% of GDP output and 11.7% of employment, according to 2004 data. The sector has been one of the main engines of economic growth in recent years, with real output rising by an average of 5.6% per year in 1996-2000, before falling back in 2001-2004 (according to the National Statistic Institute). Its activities also generate multiple effects in other economic activity sectors.

Origin of Gross Domestic Product - 2004	% of Total
Agriculture, Forestry & Fishing	3,7
Industry & Utilities	19,9
Construction	6,8
Services	69,6
Total	100

Figure 21: Origins of Gross Domestic Product in 2004
(Source: National Statistic Institute)

Within this context, it is important to mention that Portugal is one of the small European countries who have impressed in recent years by the dynamic improvement in innovation indicators according to the "European Innovation Scorecard 2004" (EIS), published by the European Commission.

Brief characterization of the construction sector:

- The project delivery process is very complicated, which turns the construction industry into one of the most inefficient industries, in spite of its great size.
- Construction is characterised by a large degree of structural fragmentation. Different tasks within the construction process are realised by a large number of participants that have to cooperate.
- It involves complex document-based processes and one of the reasons is the fragmentation of the industry as mentioned above. Some of the documents involved are:

bid documents, construction schedules, contracts, permits, design documents, licenses, work orders, work approvals, change orders, inspection protocols.

- A further characteristic is the existing multitude of standards, technical specifications, labels and certification marks.
- 90% of the sector is constituted by SMEs, most of them without ICT qualified technical staff. The shortcomings in effective knowledge transfer and training are well known weak points.
- The main players on the construction market are responsible for a large share in the sector's revenues as well as workforce contracted (See table 8):

Company	Revenues 2004 (Thousands €)	Workforce 2004 (Employees)
MOTA-ENGIL	973.290	6.087
SOMAGUE	441.093	1.433
TEIXEIRA DUARTE	390.357	2.050
SOARES DA COSTA	338.660	2.268
EDIFER	238.507	1.131
CME	206.483	878

Table 8: Main Construction Companies

(Source: Exam Magazine, Greatest 500 Companies in 2004)

The construction sector has a low productivity index. To improve this indicator, several training programmes have been implemented aiming to rethink the companies' strategies and organization in order to prepare them for a context of international competition and the entrance on the Portuguese market of foreign companies.

Quality and innovation in this sector are in an incipient stage. The main restrictions on the sector are the following: oversize, strong competition, bureaucracy and fiscal measures, labour force poorly qualified.

The innovation programmes cover traditionally advanced technology sectors, but the trend is to apply them to other sectors, including construction. The development of training, information and regulation activities are a priority and might contribute to an improvement of the sector's productivity levels. Quality and innovation are critical for the success of

construction companies, namely in terms of project quality, communication, construction materials ecology and environmental concerns.

The construction industry involves a very complex network of communication between the players. All the stakeholders involved in a construction project communicate with one another individually using faxes, telephone networks, via electronic mail and in some cases Internet-based technologies. This kind of one-to-one correspondence can make the communication network very complex, resulting in a “spider web” network (see figure 22).

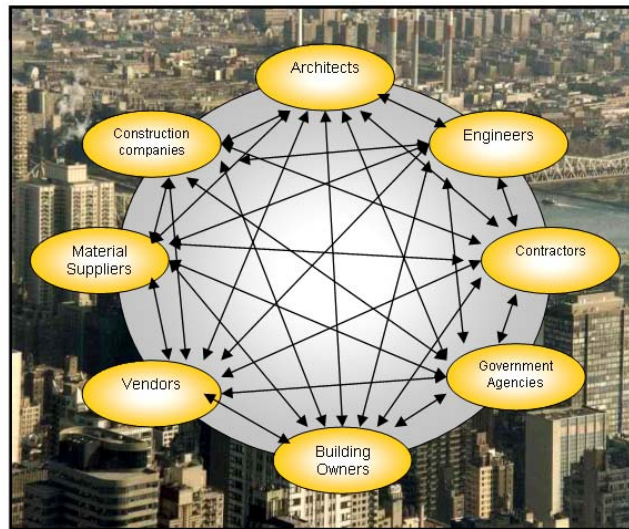


Figure 22: Spider web communication network
(Adapted from Ruikar et al., 2003)

By analysing the characteristics presented above, we can say that the delivery of the final product in the construction sector involves many players, each player being highly skilled in its own area. The main weakness is that there is no general perspective on how all the pieces fit together; the central focus is lacking. For the reasons stated above, the ICT use in construction can help overcome all these communication and interaction problems.

6.2. Procurement Process

Taking into consideration the fragmented nature of the construction industry, the main characteristics of the processes within and among construction related firms are represented by: information intensiveness and significant transaction costs (e.g., search, negotiation, contract and administration expenses, etc.).

The process of managing the purchase of supplies or subcontracting services in construction generally encompasses seven specific steps as shown in figure 23. The undertaking of each step entails the generation, transmission and management of information which varies significantly according to what is transacted. Each information process results in costs.



Figure 23: Steps of the purchasing process in the construction industry

(Adapted from Constantino and Pietroforte, 2004)

An important element that influences the procurement process is the type of product that is being purchased or service that is being subcontracted. In concordance, the procurement process has its own characteristics and the applicability of e-commerce can be adapted to the type of products or services, in order to maximize the returns and minimize the costs:

- When commodities (e.g., base materials or standard components) are considered, the purchasing process is characterized by a reduced amount of information flows with high levels of codification. In this case, Internet-based applications can lower transaction costs significantly.
- When subcontracting or customized components are considered, the purchasing process is characterized by an increased amount of information flows with varying extents of codification. In this case, Internet-based applications offer opportunities for lowering the cost of the information process.

Asset Specificity	Purchasing process characteristics	Effect of Internet-based applications
Commodities (e.g., base materials or standard components)	Reduced amount of information flows with high levels of codification	Lowers transaction costs significantly
Subcontracting or customized components	Increased amount of information flows with varying extents of codification	Lowers the cost of the information process

Table 9: Purchasing process in construction: asset specificity and effects of Internet-based applications

(Source: Adapted from Constantino and Pietroforte, 2004)

The traditional construction supply chain is made of business partners and consists of placing goods and services from suppliers of construction materials and components to contractors and then to clients and finally to the users. With the new technologies, the supply chain is no longer the same, and for example manufacturers of materials can readily access contractors and even clients. The result of this is improved accessibility and connectivity in the construction supply chain.

6.3. Applicability Of E-Commerce

E-commerce technologies can significantly contribute to increased transparency, productivity and competitiveness, as already demonstrated by other sectors. Their contribution to construction is expected to have a greater impact, due to the fact that they would act as a catalyst for integration within the sector. Effective communication is vital and these e-commerce platforms are designed so that they act as a central communication base or a central hub (see figure 24). The result of this can be a simple and efficient form of the communication network.

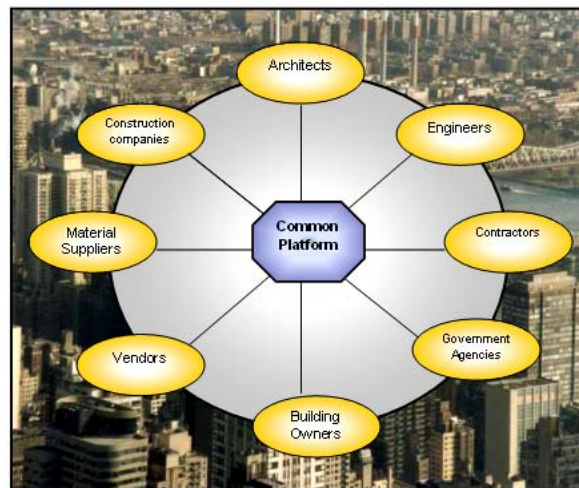


Figure 24: Common platform for communication

(Adapted from Ruikar et al., 2003)

Construction industry is characterised by a number of trends related to ICT uptake and e-business: industrialisation and productivity pressures, business process integration, B2B cooperation, specialisation and internationalisation. These trends are creating the scenery for future sector developments.

To improve organizational performance and sustain competitive advantage, many Portuguese businesses have begun to embrace e-commerce. Two main drivers in adopting e-commerce in the construction industry are:

1. E-commerce as a *strategic option* in order to leverage the benefits of ICT using the Internet (the early adopters).
2. E-commerce as a result of the *dual pressures* of competition and customer demand, which have created a new mandate: businesses must get online in order to survive.

The construction industry exhibits very favourable characteristics for the adoption of e-commerce solutions and some of these are:

- The inefficiency of the construction supply chain is significant and desirable to take care of.
- The contracting/subcontracting part of the industry is highly fragmented and dominated by small and often private enterprises. With new e-commerce solutions these parties can be connected for increased business opportunities.
- Typically construction companies have thin margins and a high-risk business profile; therefore they might prefer new web-based e-commerce solution instead of heavy IT investments.
- Construction materials and components are becoming increasingly standardized, which makes it easier for trading.
- Contractors are very concerned to diminish transaction costs and improve procurement, as approximately 50-55% of their costs are connected to purchasing activities.
- A construction project leads to a very large number of transactions that involves many different participants. The production process is complicated and involves a large number of sub-contractors and building material suppliers. New Internet based solutions provide tools for keeping track of material, customers, and lowering purchase costs.

- Construction industry is very dynamic and Internet-based solutions offer the possibility for real-time answers and elimination of geographic and time barriers.

6.4. Current Penetration Of IT

The penetration of IT in the industry is relatively low and usually limited to the design, scheduling and accounting applications. Processes are still paper-intensive, redundant, and reliant on overnight shipping, messengers, phones, and faxes. The document flow may include technical drawings, legal contracts, purchase orders, permits, and schedules.

Some of the reasons for the slow penetration of ICT and related technologies in the construction industry are presented below:

- Fragmentation of the industry which delayed a more powerful penetration of ICT.
- The roles within the industry are unclear, with the result that no single party has the responsibility for new ICT investments. Construction companies have traditionally a very small, if any, research and development budget, which directly affects IT investments.
- The existence of many different systems and an apparent lack of integration among them, which reduces the ability for communication and information sharing.

A relatively large share of ICT spending in Portugal is devoted to the purchase of telecommunication services: ICT spending as a percentage of GDP in 2003 (4.4%) was above the EU average of 3.2%. However, much of this spending appears to be for consumptive purposes, while investments in communications technologies are more limited. Moreover, the percentages of enterprises, households and schools having Internet access were very low in comparison to other EU Member States. Finally, the percentages of companies selling or buying online were the lowest in the EU.

In order to stimulate ICT use, measures to strengthen training in ICT skills have been taken by the Portuguese government both in the education system and within enterprises.

The table below (table 10) shows the evolution of B2B e-commerce as a percentage of GDP in Portugal. It clearly shows a dynamic trend and there are good perspectives for growth in the next years according to the National Statistics Institute (figure 25):

	1998	1999	2000	2001	2002	2003	2004
% of B2B e-commerce in GDP	0,0%	0,1%	0,3%	0,7%	1,5%	2,6%	4,4%
B2B e-commerce Growth Rate	450%	274%	183%	147%	130%	79%	73%

Table 10: Evolution of B2B e-commerce as a percentage of GDP in Portugal

(Source: National Statistics Institute)

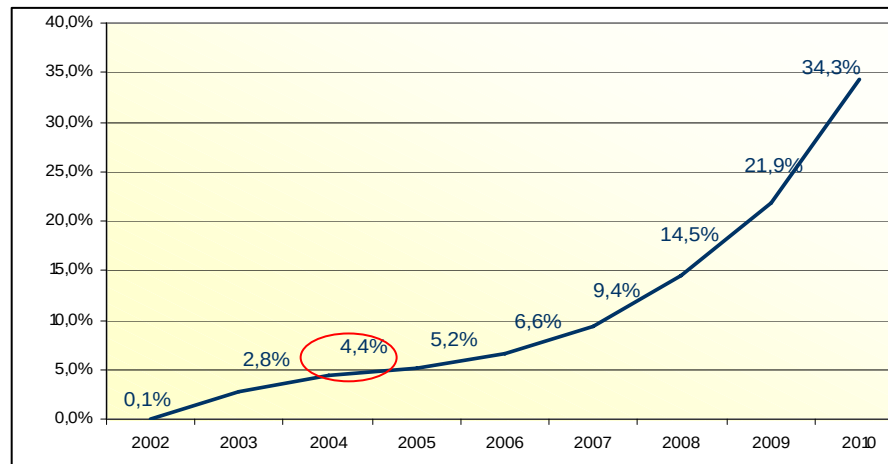


Figure 25: Forecast of the evolution of B2B e-commerce as a percentage of GDP in Portugal

(Source: National Statistics Institute)

As the software technology for construction projects has evolved, the need for data integration among participants that use different software applications has become a must. The construction industry could benefit greatly from a unified strategy for data interchange. And this is the area where the new Internet technologies intervene. An e-marketplace will group all these technologies in conjunction with data model standards, which will result in a much higher degree of integration among construction software.

6.5. Final Remarks

We view e-commerce as the application of information technology solutions to help define and develop new strategies for addressing business problems. E-commerce solutions generally require a tight integration of business solutions with an understanding of the possibilities offered by the information and communication technologies. The purpose of

the application of these technologies is to, in some way, improve the efficiency or effectiveness of practices or, in some cases, develop totally new practices.

This chapter's objective was to present the construction industry in Portugal and the extent to which e-commerce tools can help organizations become more efficient and support the relationships between business partners. The construction sector has its own specificities and the application of ITC varies considerably depending on the context of the organization (dimension, business volume), its culture, the formal organizational structure, existing policies and procedures and the leadership vision of those in management positions. These types of organizational context issues can significantly affect the ability to improve practices. What we mean by that is that there is a strong dependency between the context of the organization and the attitude adopted by the companies. They must understand the new business environment and act accordingly.

Chapter 7: E-Marketplace Solution For The Construction Industry: Econstroi.Com

*“The future is now!”
(António Lima)*



The initiative to create an e-marketplace for the Portuguese companies in the construction industry (architecture, engineering and construction) can be considered a daring and innovative project which determined the beginning of a major process of transformation of a conservative industry and a traditional way of working.

“The construction world is giant vortice², where different persons and organizational cultures gravitate. For that reason, communication becomes a great challenge, from performing a simple task to defining a company’s global strategy. The net profits and the construction lead times are reducing whilst the after construction responsibilities, the complexity and exigency degrees are increasing. Efficient work and productive use of time are becoming a must [...]. I believe that econstroi.com could represent for companies in the construction industry an instrument to overcome the efficiency barrier and become more effective. ” (António F. Lima, Administrator Vortal S.A., 2001)

The objective of this chapter is to proceed to a presentation of the e-marketplace which represents this thesis’ case study, for a better comprehension of its functionality methods and for facilitating the case study analysis presented in the next chapter.

7.1. The Company Behind Econstroi.Com

Vortal S.A, the company which administrates econstroi.com was founded in December 2000, and is the leader on the Portuguese market in the area of e-marketplace solutions for managing extended supply chain. Its major goal is to help companies make better decisions

² Vortice interpreted here as a whirlpool.

faster. It represents an ambitious attempt to integrate a value chain that potentially involves 80.000 companies (Grilo et al., 2005). It has taken the role of shaping the structure of the value chain in the construction industry.



Nowadays, the company is extending its reach towards new industries and new areas of business, providing state of the art solutions: Vortal Energy&Utilities, Vortal Industry, Vortal Government and Vortal Office Supplies. All these solutions address the development of e-commerce in new areas of activity.



Figure 26: Vortal's Business Offer

(Source: Vortal S.A.)

The main reason for the creation and development of econstroï was the need for a new communication model in support of a complex industry, which can act as a central communication base to integrate business processes, enable easier and faster communication in a secure environment and provide access to strategic industry information.

Nowadays, econstroï.com is recognised as being one of the most significant e-marketplaces in Europe, according to eMarketservices³ (see Appendix A).

³ eMarket Services is the official European portal for information on e-marketplaces.

The idea of econstroi.com was born when Mota & Ca (nowadays Mota Engil, after the merger between Mota & Ca and Engil) wanted to create a portal to manage the complex supply chain, extend their reach to strategic suppliers and share supply and demand information.

A group of 24 companies, of which 21 were construction companies and three were information technology companies, used e-business technology to develop an e-procurement infrastructure known as Vortal S.A. (see figure 27). The annual turnover of the construction companies involved in this project is 2750 million € and employs more than 20.000 people, which represents 15% of the industry's turnover and 35% of employment. Vortal S.A. is an on-line marketplace where contractors, house builders, suppliers, and installers can perform business processes on a B2B basis.



Figure 27: Vortal's shareholders
(Source: econstroi.com)

The initiative was put into practice with the help of a young and motivated team, leaded by Rui Dias Ferreira (CEO), Antonio Lima (Director of Product Development and Implementation) and Paulo Bengala (Director of Technology) which now has more than 50 collaborators. The company's headquarter is in Lisbon and has local offices in Porto and Vigo.

The project was put into practice on the base of three fundamental pillars:

1. **Organizational** - The National Construction Companies (see figure 27).
2. **Technological**: PT Prime (Data Center Infrastructure), Accenture (Software Development), Microsoft (Software Architecture) and Tradecom.pt.



3. **Financial**: Banco Espirito Santo Tech Ventures.

Vortal S.A. is the result of an initial investment of 7.500.000 Euros. To date, Vortal S.A. registered an annual turnover of 5.000.000 Euros and a net profit in the 1st semester of 2005 of 129.000 Euros, reaching its breakeven point. The table below presents a summary of the most important indicators characterizing the e-marketplace.

Econstroi.com e-marketplace	Value Accumulated 2003-2007
Number of operating companies	3.281
Number of Requests for Proposals	145.117
Number of Proposals	554.698
Value of Adjudications	1.857.652.591 €

Table 11: Econstroi.com in numbers

(Source: econstroi.com)

7.2. Company's Mission And Values

Vortal's logo is "Connecting Business" which perfectly summarizes the nature of the business activity and its vision.

Vortal's mission is to re-invent processes between business partners, by electronically integrating company and government processes, making transactions more secure, confidential, quick, easy and efficient through innovative services which add value and reinforce customer competitiveness.

As a company and as a team of individuals, Vortal's Values are:

- 🏆 Integrity and confidence.
- 🏆 Commitment to customers, partners, and technology.
- 🏆 Taking on big challenges and seeing them through.
- 🏆 Constructive self-criticism, self-improvement, and personal excellence.
- 🏆 Responsibility for results, and quality.

CONFIDENCE SIMPLICITY EFFICIENCY VALUE

Figure 28: Vortal's Values

(Source: Vortal S.A)

7.3. Characteristics And Functionality Method

Econstroi.com is a Web-based service, which enables supply chain partners to communicate, negotiate, and take part in trading, irrespective of their geographical localization. The platform enables companies to communicate and collaborate with each other, irrespective of the system they use via HTTP protocol.

Econstroi.com's activity as an e-marketplace is characterised by a number of objectives:

1. To bring communities of buyers and sellers together in order to interact;
2. To provide relevant content and construction market information;
3. To improve liquidity and lower transaction costs. try

Econstroi.com acts like the central entity (figure 30) undertakes the mission to match the demand of buyers with the offer of suppliers. It uses a categorization system (known as CATEC) which classifies each company according to its area of activity. The categorization system is based on a tree structure organized on four levels, the last level being the one that best describes the company's area of activity.

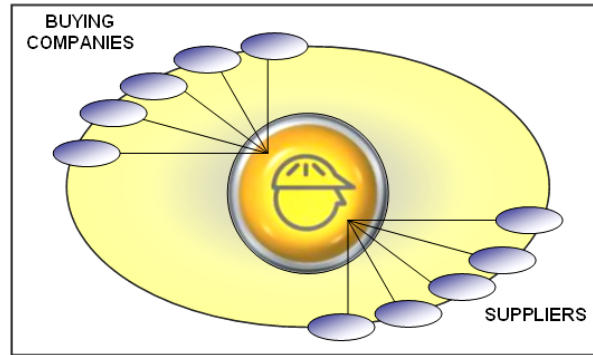


Figure 29: Econstroi.com – central entity between buyers and suppliers
(Source: Own elaboration)

The defining characteristics of econstroi.com e-marketplace are presented below:

BUSINESS DIMENSIONS	ECONSTROI.COM
<i>Trading mechanisms</i>	• Dynamic pricing – price setting mechanism. • Reverse auction – trading mechanism (buyer driven auction). • Multiple suppliers bid competitively to provide products to individual buyers. • Prices tend to fall.
<i>Horizontal or vertical e-marketplace</i>	• Vertical e-marketplace designed for the construction industry.
<i>Ownership control models</i>	• Neutral e-marketplaces – opened for all suppliers and buyers in order to explore business opportunities.
<i>Public and private e-marketplaces</i>	• Public B2B E-Marketplace. • Open trading environment; • Brings together buyers and sellers in working the construction industry in order to interact and transact.
<i>Revenue sources</i>	• Membership or license fees: Contracts which are annually renewed (Possibility of a three months experimental period). • Advertising: banners, extended listings and hyperlinks to companies' web sites, web-site creation. • Professional service fees: consulting services in the form of implementation and training services for their customers, usually on a time basis. The companies are billed in accordance to the number of consultants and the time spent in order to provide the consulting services.

Figure 30: Business Dimensions of econstroi.com

(Source: Own elaboration)

The process of launching a request for proposal is described in figure 31. The undertaking of each step entails the generation, transmission and management of information.

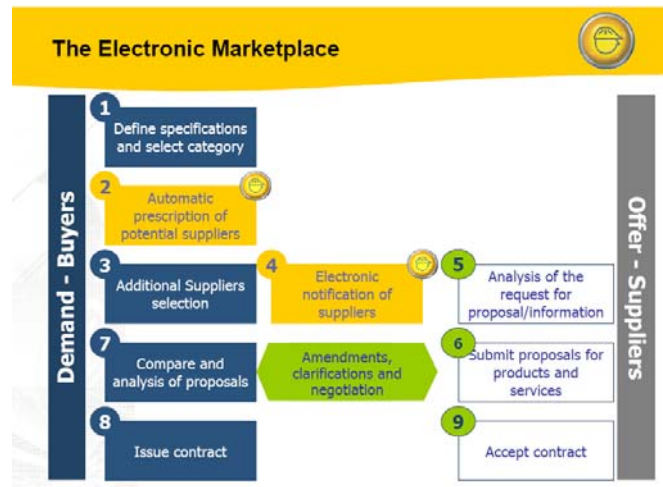


Figure 31: Steps in launching a request for proposal

(Source: econstroi.com)

1. The buyer defines the specifications of the RFP and associates a category to it (according to the materials needed or the nature of service/subcontract);
2. All suppliers enlisted in that particular category are automatically invited to respond;
3. The buyer has the possibility to manually introduce other suppliers (who do not have that particular category associated or whose services do not grant access to its request);
4. All suppliers receiving the buyer's request, will automatically receive a mail announcing that in their econstroi.com area have a new RFP and can respond to it;
5. The suppliers analyse the RFP;
6. If interested, suppliers can automatically submit their proposals. Otherwise, they can discard the RFP and let the buyer know the reason (for ex. out of their geographical area of activity, the product is out of stock for the moment, full capacity, etc.)
7. The buyer analyses the proposals received using an automatic comparative map and on the basis of its criteria (price, delivery period, payment method) selects a supplier for awarding the adjudication.
8. The buyer awards the adjudications;
9. The supplier accepts the contract.

By using econstroi.com, the buying entities need to establish only one connection to the e-marketplace which automatically connects them with all suppliers. In this way they are connected to all the suppliers pertaining to a certain area of activity. As a result, econstroi.com offers new possibilities for relationships and new business opportunities.

7.4. Products And Services

From December 2000 until October 2001, econstroi.com provided only informational functions, taking the necessary time and actions to prepare its core business: an intermediary between buyers and sellers in the construction industry which provides an instrument to support electronic commerce between parties.

Nowadays, econstroi.com combines three functions (Grilo et al., 2005): informational, transactional (the most used), and collaboration features. The table below summarizes econstroi.com's offer:

Buyer Side Products and Services	Supplier Side Products and Services
Buying functionalities: automatic submitting request for proposals.	Selling functionalities: present proposals by responding to buyers' requests.
Ask for information and share documents or project models among the participants in the same project.	Negotiate and present proposals.
Compare budgets and choose among them the best proposal and carry out the respective orders and selection process.	Prospect for new clients, new business opportunities.
Coordinate the logistic process.	Marketing activities: company promotion.
Contract financing services and perform financial transactions.	Manage sales.
Manage construction projects.	Access to information about the construction market, main events and activities.
Consulting services: implementation and integration of econstroi.com with the current ERP solution used by the buyer.	Consulting services, regarding the buyer supplier relationship and the facilitation of the buyer supplier interface.

Table 12: Econstroi.com products and services: buy side and sell side

(Source: Own elaboration)

We can also identify other business activities under Vortal's management: sharing and information management; cataloguing and news about the construction sector. In addition to the core services designed for the buyer (launching requests for proposals) and the supplier (responding to the buyers' requests), econstroi.com offers a set of associated services:

- A search engine including more than 700 construction projects from all over Portugal as well as Spain, using different criteria.
- Econstroi.com Supplier Directory including more than 30.000 companies providing supplier information for strategic sourcing. The directory includes all the information needed to identify and compare material suppliers, service providers, general contractors, using different search criteria.
- An area addressed to managers with the purpose of providing strategic market information. It includes information about a company's market share inside econstroi.com, the number of direct competitors, and a hierarchy of the top buyers and sellers within the associated categories (see appendix C).
- Marketing services: banners/mini-banners, logos, company presentations, catalogues.
- Homepage construction.
- Consultancy services.

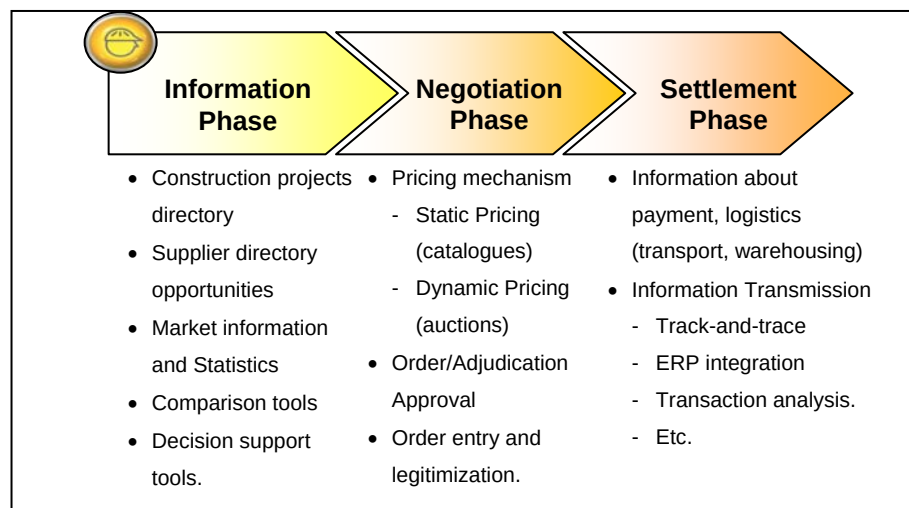


Figure 32: Econstroi.com: succession of services according to the transaction phase
(Source: Own elaboration)

Construction companies can join the econstroi.com market for free for a three months experimental period. However, they are required to go through a registration process, which includes authentication and pre-qualification procedures. After the three months period, the companies can subscribe to different types of services with different degrees of complexity and range. There are different types of paying methods and the fees are in conformity with the company's turnover.

All goods, services and information are provided in a safe and confidential environment based on encrypted and closed communication channels. Econstroi.com is certified by the ISO27001 International Quality Standard, is recognized by the Portuguese Electronic Commerce Association (ACEP) and the digital certificates are recognized by Verisign International and Multicert.



7.5. The Target

Econstroi.com represents an ambitious attempt to integrate a value chain that potentially involves 80.000 companies (Grilo et al., 2005). It has taken the role of shaping the structure of the value chain in the construction industry. The target areas are represented by: real estate government agencies, construction companies, subcontractors, equipment and material providers and logistic partners (figure 33).



Figure 33: Target companies

(Source: econstroi.com)

7.6. Econstroi.Com Value Proposition: Connecting Business!

Econstroi.com undertakes the task of joining transactional advantages and the elimination of geographical barriers whilst serving an important role in catalysing business relationships and partner discovery. It enables complex interorganizational processes and inter-enterprise process integration.

Its role as an e-marketplace lies in providing a framework for scalable, dynamic inter-enterprise process integration. Besides its core transactional function, it also allows participants to share industry information, current trends and best practices, identify and profile potential business partners, link up with industry buyers and suppliers, and facilitate creation of consortiums of organizations to leverage aggregate spending.

Essentially, the major value propositions undertaken by Vortal are presented below:

- 🌟 Save clients time and money compared with traditional methods of doing business.
- 🌟 Improve the exchange and management of information.
- 🌟 Improve accuracy throughout the tendering and quotation process.
- 🌟 Reduce time wasted on low-value administration like faxes, phone calls and travelling.
- 🌟 To combine innovative technology with procurement expertise.

In other words, it aims at connecting businesses in a simple and efficient way and in this manner, generate new business opportunities.

7.7. Final Remarks

The difficult and daring task assumed by Vortal S.A. was to create a new reality in an old-fashioned industry and eliminate barriers. It provided the actors with the advantage of network space by means of unlimited connections and relationships. The emergence of the econstroi.com project has led to new ways of interacting and inter-linking between

individuals as well as organizations. It acts as an intermediate, bridging the relationship between buying and selling companies.

In Vortal's vision, the Internet can be viewed as a network and each connection in the network represents the possibility of a relationship. Each participant in the e-marketplace is connected to all other participants in order to support transactions, share information and documents, and even cooperate. There is competition between suppliers and between buyers, but it can provide a space which facilitates cooperation.

The e-marketplace provides a virtual space where buyers and suppliers come together to explore new business opportunities. The goal is to attract the biggest possible number of buyers and suppliers, which will become members. Buyers bring purchase needs while suppliers bring selling offers. The e-marketplace will then match purchase needs against selling offers, encouraging its members to undertake new trading exchange.

The next chapter will put into practice all the models presented earlier and present the case study analysis of econstroi.com

Chapter 8: Case Study Analysis: The Change In The Portuguese Construction Industry Driven By Econstroi.Com

*“...The people who are crazy enough to think they
can change the world are the ones who do!”
(Apple Computer)*



Based on the frame of reference emerged in chapter 4 (figure 19), this chapter will present the case study analysis and determine the impact of econstroi.com on the construction industry in Portugal. The impact of econstroi.com will be analysed at three levels: company level (section 8.1), buyer-supplier relationship level (section 8.2) and industry level (section 8.3). The objective of this chapter is to present how Internet tools (in this case an e-marketplace) can assist companies in redesigning business models to transform processes and organizational structures. On the other hand, it will examine the change in the structure of the construction industry and the enhancement in productivity and competitiveness.

This thesis continues the idea “...that information technology is evolving from a tool that incrementally improves ‘back-office’ productivity to an essential component of strategic positioning that may alter the basic economics, organizational structure and operational practices of facility management organizations and their interactions with service providers (architects, engineers and constructors)” (Johnson & Clayton, 1998, page 3).

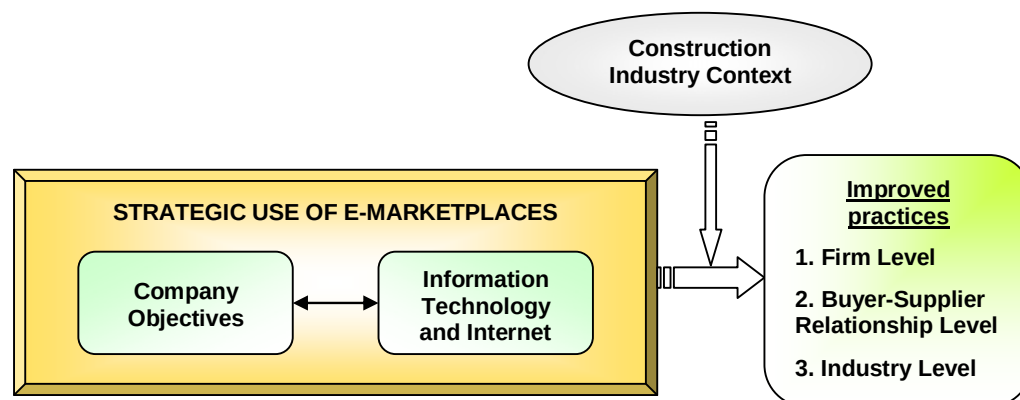


Figure 34: Emerged frame of reference

8.1. Econstroi.Com E-Marketplace - Company Level Impact

This section will present the change and impact brought about by econstroi.com as at company level in the construction industry. This can be seen as a change in terms of process improvements, cost reductions and new business opportunities. In the last part of this section, two case studies of a buying and a supplying company, will illustrate these changes.

Econstroi.com started to assume a key role to a greater extent in the Portuguese construction industry. Nowadays, the understanding on behalf of the construction companies of the modalities in which the ICT and the Internet are influencing the businesses became a must. As a result, managers must assure that their organizations use technology in the most efficient way. The company level impact of econstroi.com will be analysed following Bakers's model in terms of process improvements, purchase cost reduction and the generation of new business opportunities.

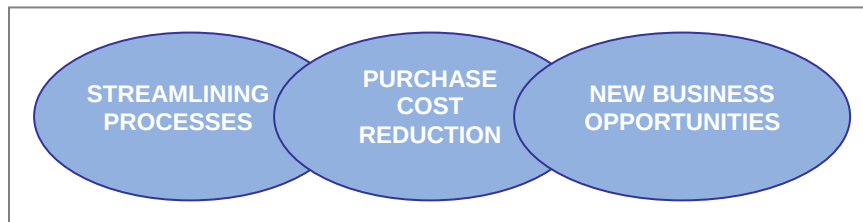


Figure 35: E-marketplace benefits

(Source: Baker, 2000, p. 105)

8.1.1. Process Improvements

We live in a constantly changing world where everything is in continuous motion and this is also a reality in the construction industry. In order to survive, companies have to keep up with the pace of change and the innovation process. To achieve this, they must become more flexible and simplify their processes.

Econstroi.com, as one representative of the new Internet economy, offers opportunities for firms in the construction industry to become more flexible through:

- Efficiency and productivity benefits: by means of automation, integration and information transparency.
- New value creation: tangible benefits (savings and process time reduction) and intangible benefits (like knowledge creation, improvement in the buyer supplier relationship, new business opportunities, innovation and know-how).

The ICT uptake in the construction industry has been slower comparing to other industries, for two reasons strongly related to its specificity: the importance attributed to the traditional way of doing business (face to face contacts and negotiation) and the low investments in IT comparing to other industries. This fact was confirmed by the interviews conducted with Vortal's consultants and administrators.

“Econstroi.com has challenged the construction industry. We have challenged long-accepted business models in a traditionalistic industry. We started this project with the conviction that we would transform the business processes. Econstroi.com has opened out new possibilities for companies and made them consider the re-engineering of existing processes by deploying fundamentally new ways of conceiving and executing business processes.”(Rui Dias Ferreira, CEO, Vortal S.A.)

An important question which has to be addressed by all managers is: why change the way you do business? The answer is apparently simple: because everything around your business is changing. The “constant” that you take for granted today - the current supplier, the habitual buyer, the pricing structure - might be gone tomorrow. This means that firms must bring more flexibility in their business processes. All these involve fundamental transformations to the way in which any business operates.

The process of change is not an easy task and was confirmed by the interviews. But it makes the difference between staying in control and getting overwhelmed by the rapid pace of change. Manual processes, inflexible organisations, too much paperwork can bring prejudice to a company's competitiveness.

“Q: What are the main motivations to use e-procurement?

A: Elimination of bureaucratic service and slow pace of processes. We need to be more efficient, more competitive and establish new business contacts.” (Supplier Statement)

By using Internet strategies, the company reorganizes its processes, with the result that costs are reduced and current processes are made more flexible. It is a search for efficiency using Internet technology.

Another important impact of econstroi.com, can be described as an improvement of the information processing capabilities. In Chapter 6 - overview of the construction industry in Portugal, we have presented the fact that the construction industry is highly fragmented. Many independent firms cooperate in the various phases of a construction project. This cooperation is based on an array of contractual transactions and the exchange of a significant amount of information. The execution of each transaction entails: information costs for the search and identification of the contractual party (e.g., a supplier or subcontractor), the negotiation and drafting of the contractual agreement and ultimately, the administration of the contract itself.

The major impact of econstroi.com at company level is illustrated by the potential benefits in terms of:

- Improved information processing capabilities (a common platform for all industry players) and
- Reduced transaction costs and more transparency because buyers have better information about suppliers, prices, product availability and/or product selection.

“Q: What are the main benefits provided by e-procurement?

A: Dynamism, diversification of sources, reduction of costs and safety of process.” (Buyer Statement)

To better understand the impact of econstroi.com we have to make a comparison between the traditional procurement process and the innovative characteristics provided by the e-marketplace.

In the traditional procurement process, when a buyer submits a request for proposal for a construction project, usually sends it by fax to a reduced number of habitual suppliers that work in that particular area. Subsequently, the buyer receives suppliers' proposals via fax. He makes a manual comparison between the proposals or has to manually introduce them in an excel file. The best proposal is awarded according to the buyer's criteria as well as the nature of the relationship that the buyer has with the respective suppliers. This process involves a limited choice between suppliers, taking into consideration the fact that only a small number of suppliers received that particular RFP.

Alternatively, when submitting the same RFP via econstroi.com two things happen: on one hand, the buyer's selection possibilities between suppliers increase a lot and on the other hand suppliers have more business opportunities, since all suppliers that work in that particular area can submit their offers. The RFP contains all the necessary information for submitting a proposal, and suppliers just have to fill in the fields: products, quantities, delivery method, price, and payment method - in order to ascertain the conditions for the purchase of goods or services. There are n buyers and n suppliers which can interact and connect inside the e-marketplace on a common platform (see figure 36).

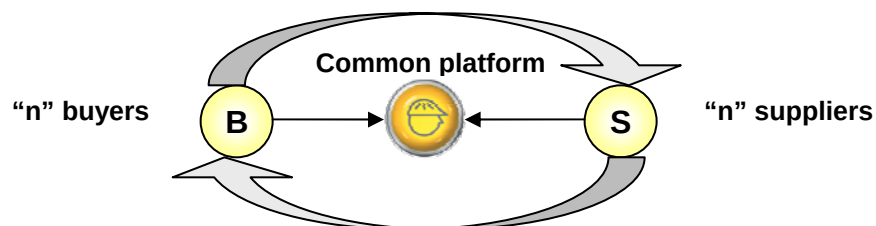


Figure 36: Econstroi.com – universe of market players

(Source: Own elaboration)

When a buyer launches a RFP, that request is automatically directed towards all suppliers enlisted in that specific area of activity (according to the econstroi.com categorization system - CATEC). As a result, the number of potential suppliers increases in comparison to the habitual suppliers list. After launching the RFP, the suppliers receive it and they can interact with the buyers in order to further negotiate. The buyer will engage in one-to-one

conversations with those suppliers (see figure 37). The buyer has an individual business relationship and negotiation process with each supplier that receives its RFP. Once all the proposals have been submitted by the suppliers, the buyer will use a comparative map and several supplier selection criteria in order to make a decision. This process is also automatic, econstroi.com assisting the buyer in deciding which offer is the best one to consider. It also provides the possibility to rank and evaluate suppliers in terms of different criteria, selected by the buyer.

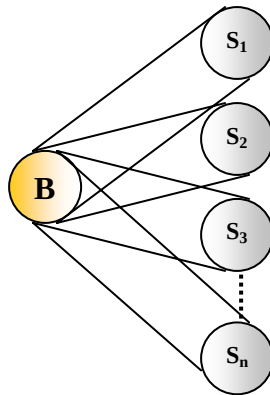


Figure 37: Buyer/supplier one-to-one relationship
(Source: Own elaboration)

As presented by Vortal S.A., econstroi.com's task is to provide the necessary platform and tools, assuring the transition towards the Internet economy and enabling companies in the construction industry to become more productive.

Of course, there is some resistance on behalf of the companies as there are some suppliers that have to use econstroi.com because their customers are submitting their RFPs online on the e-marketplace. This means that they are afraid to loose those opportunities and business relationships. In the same time, the competition increases since more suppliers are competing in the same time.

“The key factor driving the use of e-commerce tools in the construction industry is the competitive advantage such technology offers. On the other hand, companies are also afraid about the consequences of not adapting to the realities of the business environment.” (Paulo Craveiro, Account Manager, Vortal S.A.)

An interviewed buying company stated that the adoption of an e-marketplace as an e-procurement solution is not a course without any obstacles. Obstacles were encountered both in the supply chain, as well as in the internal structure of the company. The main challenge in implementing any new solution is the commitment of partners along with the relationship chain, both for buyers as well as for suppliers. The adoption of a new relationship model imposes new processes to the commercial partners and in order to change they must see value in it and understand the benefits that can be generated. The company's internal structure has to be prepared also, since it involves redesigning processes and organizational changes. All these have a direct impact on people's daily routines and it is therefore, subject to rejection and criticism.

“Q: In your opinion, what are the main barriers for implementing e-procurement inside your company?

A: We encountered like: commitment of our partners along the supply chain, the redesign of processes and organizational changes, as well as fear that the solution will affect the procurement personnel and their roles[...].” (Buyer Statement)

Econstroi.com's consultants have to work and diminish companies' resistance to change and therefore make the transition towards e-procurement activities and e-commerce easier for the procurement personnel. The adoption of econstroi.com by a growing number of companies in the construction industry has led to the transformation of the workplace and small sized companies have more difficulties in adapting the bigger ones have.

“Construction companies are often characterised by insufficient sharing of business information between managers and employees and among employees, because the personnel's daily routine tends to be extremely busy. Econstroi.com offers a platform that favours also internal communication and collaboration between our employees. Everything somebody does online is registered and I have the history of what has been done as well as the other employees that work in the same area. Econstroi.com has improved our internal communication and collaboration.” (Supplier Statement)

The above statement made by the director of a supplying company of equipment and tools, strengthens the assertion that econstroi.com has proved itself to be an important tool for improving internal collaboration between employees.

“Q: In your opinion, how did econstroi.com impact the procurement personnel?

A: New knowledge, skills and abilities are required in any company and at all levels.

The business model is being redefined, and with it, new values are being brought to light [...]. But, the pace of change is dependent on the organization's internal culture, dimension and strategy. From my personal experience, the micro-firms, which constitute an important part of the universe of the construction sector, have more difficulties in adapting to the new business environment than the bigger firms. This is because of a lack of internal capacity, lack of qualified personnel, lack of financial means as well as the incapacity to work with greater contractors (they would have difficulties in honouring the respective requests).” (Paulo Craveiro, Account Manager, Vortal S.A.).

It is important to mention that the access to information inside econstroi is granted according to some access rights. This means that in every company that uses econstroi.com there is a key user that has the capacity to grant different levels of access to the other users in accordance to their job functions and responsibilities. All personnel can share valuable business knowledge and experience, once online.

The process improvements that are generated by econstroi.com could cause confusion if the company is not ready or is resistant to change. Nonetheless, companies are starting to a larger extent to discover the benefits brought by the Internet and to dedicate themselves to this process of transition.

8.1.2. Cost Reductions

This section intends to discover up to what point the use of an e-marketplace can generate value for companies in all its forms. And one form to generate value is represented by cost

savings. With this purpose, were interviewed many of Vortal's consultants as well as companies representing both buyer and supplier side in the construction sector. The questions were asked precisely to understand the nature of the advantages proportioned by econstroi.com as perceived by the involved parties.

“Comparing to the traditional procurement process, econstroi.com brings on various advantages, both at administrative level as well as managerial level. Companies benefit from considerable savings. In addition to the money savings, the suppliers have more time to prepare their proposals to the buyers' requests [...]. After all, a better planning of the company's selling activity. On the buyer side, the statistics regarding the savings demonstrate the impact of econstroi.com. In every 1.000 proposals received, the buyer benefits from cost reductions in the amount of 60.000€.” (António Lima, Administrator, Vortal S.A.)

Econstroi's objective to create value for its users can be regarded from two perspectives representing both sides of the same coin: direct, tangible benefits like money savings and process time reduction and indirect advantages represented by intangible benefits like knowledge creation, improvement in the buyer supplier relationship, new business opportunities.

Direct value brought by econstroi.com at firm level is directly connected with cost reduction. A very important aspect which favours the increase in the number of firms using econstroi.com as an e-marketplace both on the buyer and supplier side is:

“[...] the simplicity of the utilisation, the low costs of implementation as well as the advantages derived from using the e-marketplace” (António Lima, Administrator, Vortal S.A.).

In order to completely understand the cost reductions, we have to know what are the costs involved and the technology required for using econstroi.com. Summarized in the table below (table 13) are the requirements, costs and possible benefits derived from using

econstroi.com, for a better understanding of its functionality and advantages. It is important to mention that companies beneficiate of a three months utilisation period without any charge whatsoever. This trial period intends to give them sufficient time to see if econstroi.com applies to their business.

Equipment Requirements	The amount of essential technology needed is surprisingly small and companies can implement econstroi.com with as little as: • A computer. • Internet browser. • Internet Connection (ADSL preferred).
How much will it cost?	The prices are confidential but econstroi.com proposes different payment solutions to its customers: buyers and suppliers, which lead to a monthly amount of money that can be easily paid. The prices are in conformity to the company's business volume.
What can I use econstroi.com for?	There are many applications and companies may use econstroi.com for different purposes, according to the company type: buyer or seller. • Buying functionalities: submitting requests for proposals, coordinating the construction project in all its phases. • Selling functionalities: possibility to respond to buyers' RFPs, to promote the company, its products and services.
What are the possible benefits of econstroi.com?	• Streamlining processes. • Reducing costs. • Cut down repetitive work. • Increase efficiency due to reduced effort. • Managing information effectively. • New Business Opportunities. • Improvement of the relationships between business partners (buyers and suppliers).

Table 13: Econstroi.com Requirements, Costs and Benefits

(Source: Own elaboration)

The table below (table 14) presents real data extracted from econstroi.com category market. The data concerns the most important indicators in six construction market categories: products and building materials, services and subcontracts, supply and maintenance of equipment, machines and tools, rent of equipment, machines and tools, workforce services

and support resources. The statistics cover the period of time between 1st of January of 2005 and the 31 of August of 2006. As it can be discovered, the most dynamic areas are the products and building materials and services and subcontracts with the highest number of requests for proposals launched and proposals received.

Econstroi.com Categories	Number of Requests for Proposals (RFP)	Proposals Received	Number of Adjudications	Value of Adjudications	Requests for Proposals Ratio
Products and Building Materials	23.805	117.629	19.625	311.379.646	4,94
Services and Subcontracts	6.030	22.691	2.772	330.650.644	3,76
Supply and Maintenance of Equipment, Machines and Tools	16.479	59.201	15.965	38.255.629	3,59
Rent of Equipment, Machines and Tools	4.425	11.714	3.704	13.233.497	2,65
Workforce Services	431	1.017	254	17.048.944	2,36
Support Resources	1.903	6.619	1.531	30.664.590	3,48
Total	53.073	218.871	43.851	741.232.950	4,12

Table 14: Number of RFPs, Proposals Received, Adjudications and Value of Adjudications per category in econstroi.com

(Source: econstroi.com)

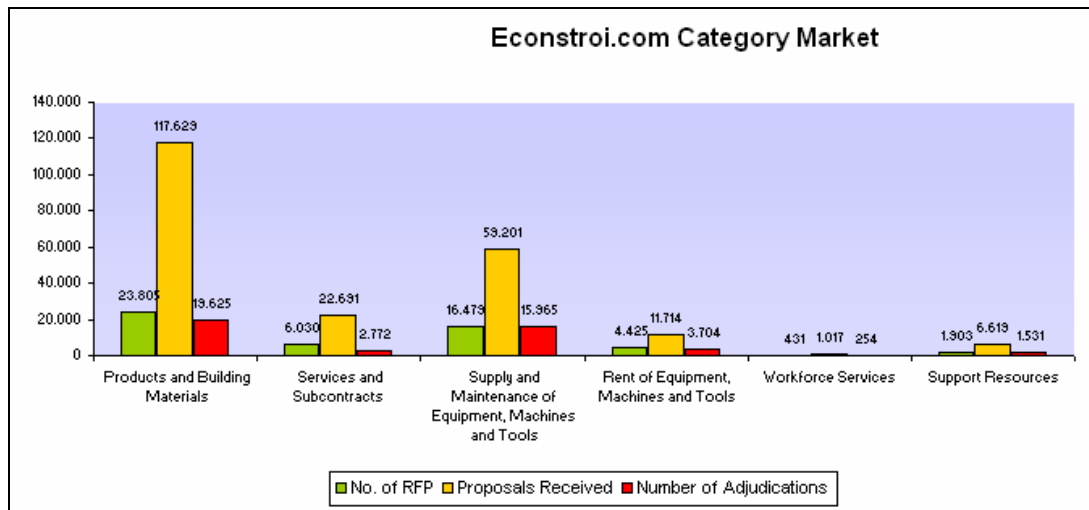


Figure 38: Representation of RFPs, Proposals and Adjudications per category in econstroi.com

(Source: econstroi.com)

The indicators represent the RFPs submitted by the buyers online, the number of proposals received from the suppliers for the respective RFPs, the number of adjudications and their value. A very interesting indicator is the RFPs ratio which shows on the average, the number of proposals received per RFP submitted. As a result, when a buyer launches a

request for proposal, it receives on the average 4.12 proposals from the suppliers receiving that particular RFP. This means that the transaction costs are diminished drastically in the area of search and information costs; also, access to a larger pool of suppliers.

In order to understand the benefits generated by the use of econstroi.com, we have to present the traditional procurement process in construction, which up to a certain point is limitative:

- The buyer launches a RFP via fax or mail (when he needs to buy products, materials, equipment or services), incurring costs with paper, printer, etc. The process is not automatic and the number of suppliers receiving the RFP is limited.
- On the other hand, the supplier receives a limited number o RFPs, via the same mediums, according to its habitual customers, with whom he has a business relationship.

The use of econstroi.com offers both buyer and seller more business opportunities, by having access to an instrument that makes the procurement process more efficient, rapid and reliable. In the same time, provides efficient document management functions, since all the information regarding the procurement process, RFPs submitted/received, proposals received/submitted is stored online with 24h access.

“Business leaders continually evaluate new methods to improve the profitability levels of their companies and construction industry is not an exception. A way to achieve these improvements is by increasing revenues and decreasing costs. For the buyer, econstroi.com is a cost saving measure that can dramatically improve profitability by lowering sourcing costs. The value proposition of econstroi.com is that it enables buying organizations to obtain the highest quality of goods and services needed, at the lowest total cost.” (António Lima, Administrator, Vortal S.A.)

The graphic below (see figure 39) presents the savings that can be achieved by buyers using econstroi.com. A characteristic of the buyers is that they usually buy in great amounts

involving high sums of money. The fact that they have access to a greater pool of suppliers increases the possibility to obtain better prices, better payment conditions or delivery terms.

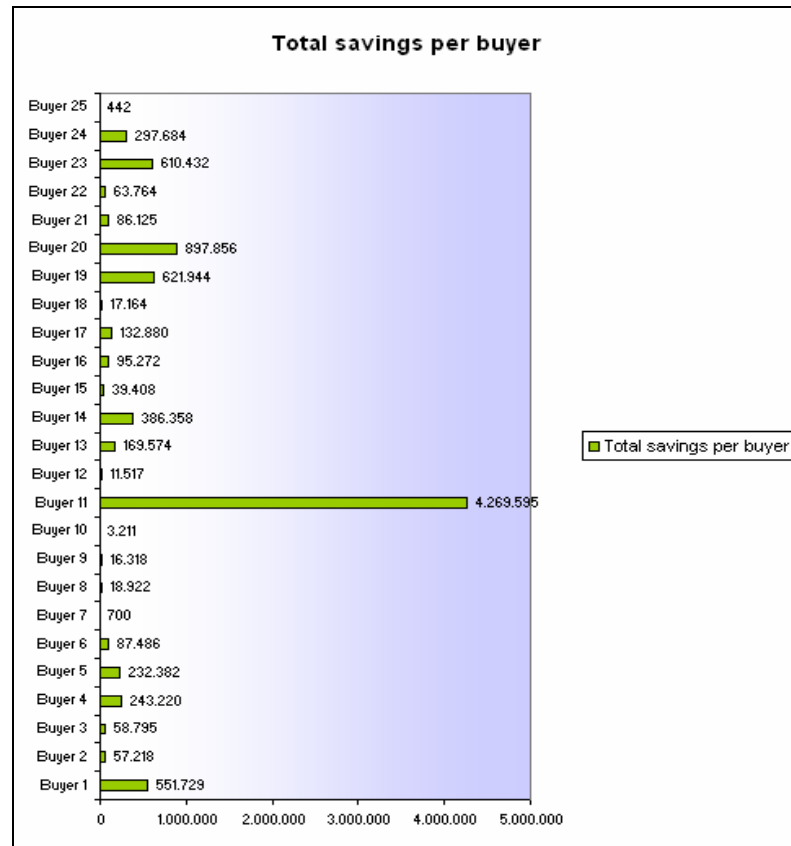


Figure 39: Buyer's savings from using econstroi.com⁴

(Source: econstroi.com)

Another way to discover the cost savings generated by econstroi is to analyse the profit and loss statement. The total expenses in the profit and loss statement of a construction company are defined in their greatest share by the operational expenses, which represent the cost of merchandise, raw materials and subcontracts. It includes also the additional costs like: specification/RFP preparation, supplier search and respective telephone contacts, receive/review/distribute and evaluate proposals, negotiating and contracts, document storage, telephonic contacts, document handling, mailing and reproduction. The cost savings generated by econstroi.com in this area are considerable, since the processes are automated, the administrative costs reduced; and all these aspects were confirmed by the interviews.

⁴ Buyers' names are confidential.

As it can be easily seen in the table below (table 15), in the composition of the turnover of a construction company, the total expenses represent 95%. In the structure of the total expenses, the operational expenses (cost of merchandise, raw materials and subcontracts) represent almost 79%. In the structure of the turnover, operational expenses represent an important percentage of 75%. Within this frame, a buying company has two available scenarios in order to increase its profitability: to increase its sales (turnover) or to decrease the expenses. As it can be easily seen in the table bellow, buying 1% more efficient (reducing the operational expenses) is equivalent to a more than 20% increase in sales. In both cases, this results in a 50% increase in the net profit.

	2004	% of Turnover	20% Turnover Increase			-1% in Total Expenses (Strategic procurement)			
			20% Turnover Increase	Δ (value)	Δ (%)	1% Total Expenses Decrease	% of Turnover	Δ (value)	Δ (%)
Turnover	30.000.000 €		36.000.000 €	6.000.000 €	20%	30.000.000 €			
Total Expenses	28.500.000 €	95%	34.200.000 €	5.700.000 €	20%	28.200.000 €	94%	-300.000 €	-1%
Operational Expenses (cost of merchandise, raw materials and subcontracts)	22.500.000 €	75%	27.000.000 €	4.500.000 €	20%	22.200.000 €	74%	-300.000 €	-1%
Operational Profit	1.500.000 €	5%	1.800.000 €	300.000 €	20%	1.800.000 €	6%	300.000 €	20%
Net Profit	600.000 €	2%	900.000 €	300.000 €	50%	900.000 €	3%	300.000 €	50%

Table 15: Strategic Sourcing Saving Potential

(Source: econstroi.com)

8.1.3. New Business Opportunities

Besides all the financial benefits illustrated by the cost reductions from strategic sourcing, econstroi.com offers other benefits to its costumers, like connectivity, speed and intangible advantages that cannot be represented with numbers but can be illustrated by the change in the business practices and the reengineering of the procurement process, generating structural, organizational and cultural changes. These changes are close related to connectivity, transparency, sharing, and integration.

As presented by António Lima, the company focuses on providing services that will increase the connection possibilities between companies:

“...there are a number of different sources of productivity growth, like the quantity and quality of labour, and econstroi.com is working in the direction of improving the quality of labour by offering the necessary instruments which can help a firm develop its activity with less effort, connecting businesses, streamlining processes and of course, bring new business opportunities.” (António Lima, Administrator, Vortal S.A.)

By bringing a new business model on the market, econstroi.com indirectly addressed construction companies some questions which acted in the direction of improving their businesses, employees’ preparation and network of relationships:

- Addressed such questions as “*know how*” by improving the knowledge base of the procurement personnel in order to increase their performance;
- Addressed such questions as “*know what*” by improving the processes (the knowledge and communication flow) and the internal performance.
- Addressed such questions as “*know who*”, related to the importance of the relationship and knowing the right persons. In other words, it gives access to higher levels of decision-making authority by bypassing “gatekeepers”.

Fernando Lima from Vortal S.A. reinforces what was stated above and presents econstroi.com as the entity that brings together on the same platform the constructors and suppliers giving them complete liberty to find the best match for their company’s objectives (purchasing or selling).

“Regarding market advantages, econstroi.com allows supplier to widen its business range and buyer to procure according to its desired purchasing formula. Suppliers have access to more business opportunities and can create a business relationship with clients with whom they have never worked before, while buyers have a better view over the construction market, access to more suppliers, better prices, better purchasing solutions and more overall quality.” (Fernando Lima, Vortal S.A.)

From the interviews conducted at Vortal S.A., the generation of these benefits is directly connected to the correct utilisation of the platform.

“In my opinion, econstroi.com can improve information management within the firm, leading to more efficient business processes and better firm performance. It all depends on how companies use it, how often, how dedicated.... The correct use of econstroi.com can reduce transaction costs and increase transaction speed and reliability as well as bring new business opportunities. Our customer database of more than 30.000 companies allows firms and managers to have access to privileged and specific information (like company detailed area of activity, contacts, managers, address, certificates, etc.). They can easily use it for new business contacts. They just have to be proactive” (Paulo Craveiro, Account Manager, Vortal S.A.)

According to a buying company interviewed, econstroi.com favoured new business contacts representing alternative procurement sources. The outcomes from going online confirm the findings of the academic literature:

“Q: In your opinion, what are the major changes in the purchasing department with the adoption of econstroi.com?

A: The possibility for new alternative sources and as a result, the improvement of our performance in acquisitions.” (Buyer Statement)

In terms of information transparency, the track and trace tool, offers procurement professionals and managers important market information like: whenever a project or a supplier's proposal is awarded by the buyer, the system informs the other participants that the bid is closed, as well as sends information regarding the company that won the adjudication. Also, companies are informed whenever the buyer visualises their proposal and therefore. The asymmetry of information is diminished and suppliers are more secure when they negotiate.

Such benefits apply not only to larger firms but for small and medium enterprises also.

“Econstroi.com enables small and medium enterprises that remain in local and regional markets to gain access to new customers and to expand their markets geographically. It can therefore provide small players with an opportunity to connect with many other possible partners, including those previously inaccessible.” (José Cidras, Project Manager, Vortal S.A.)

Figure 40 summarizes the benefits related to the use of econstroi.com as they were presented in this section. The benefits start from streamlining processes by automating them, continue with the possibility of cost reductions and new business opportunities and all these can generate the re-engineering of business processes. It is therefore a gradual process experienced by companies.

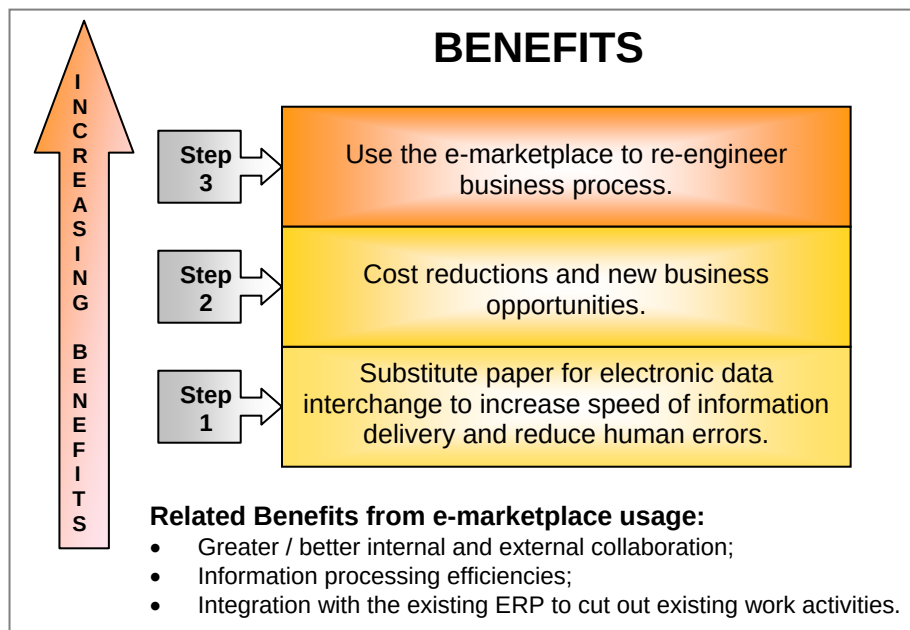


Figure 40: Summarization of the related benefits from using econstroi.com by firms in the construction industry

(Source: own elaboration)

8.1.4. Attitudes And Views

A. Buyer Perspective – Mota-Engil Success Story



Mota-Engil Group is today one of the most representative Portuguese economic players with strong leadership in the building area and more than five decades of experience. The group is composed of almost 90 companies sharing significant diversification.

The building area holds on to a very good internationalisation share and is a highly competitive both on national and international markets. It achieved a leadership position in the Portuguese engineering and building sector, contributing to the market with creative solutions, innovation and alternative ways of thinking.

Mota-Engil became engaged in electronic commerce to reduce transaction costs, improve efficiency, perform transparent transactions and improve the speed of the transaction processes. In procurement activities, e-commerce contributed to increased efficiency and reduced duplication of paperwork. Mota-Engil has been a pioneer in supporting econstroi.com and Vortal S.A. since its very beginning, given that it is one of the initial and most important shareholders. The result is one of the most important e-marketplaces in Portugal and a reference in the European Union.

Mota-Engil has been particularly dedicated to using econstroi.com as it tries to take full advantage of all the opportunities and benefits generated by Internet based solutions. As presented by Mota-Engil, some of the benefits produced by econstroi.com relate to the reduction of operational and personnel costs, diversification of procurement, simplification of ordering process and streamlining of communication. Besides that, the profile of the purchasing team has changed as well as the tasks performed by them.

“One of the improvements generated by the use of econstroi.com is represented by the reorganization of the purchasing team; as a matter of fact, the number of persons working in the procurement department has been reduced but the profile has evolved towards a team of professionals, promoting innovative spirit and creativity, ready to adjust to any changes in the business environment.” (Eng. Eduardo Pimentel, Director of the Technical Department, Mota-Engil Engenharia e Construção S.A.)

It is often said that knowledge is power and nowhere is this truer than on the Internet. Starting from this point, Mota-Engil has used econstroi.com to perform an easy comparison of different proposals from a multitude of suppliers. This resulted in the simplification of the procurement and decision making process, streamlining of business processes with suppliers, cost reductions and access to new business relationships.

“The most important advantages related to the utilisation of econstroi.com are explained by the extension of the supplying sources and as a result we have access to new business relationships with new suppliers, as well as the increased transparency in the buyer-supplier relationship. Also, the easy integration between econstroi.com and our existent ERP solution, guarantees the perfect alignment and systematisation between the procurement and production department.” (Eng. Pereira da Silva, Director of the Procurement Department, Mota-Engil Engenharia e Construção S.A.)

Mota-Engil has been an example in terms of good utilisation practices. For this reason, the results have been more than positive, demonstrating the utility of econstroi.com. In order to identify the cost savings, Mota-Engil made a comparison between the quotations received from the habitual suppliers via traditional methods and the quotations received via econstroi.com. Two categories were analysed: products and building materials and subcontracts. More suppliers were reached and the competition between them intensified. By comparing the price indexes, it is therefore possible to identify the decrease in price due to econstroi.com as it is shown in table 16:

Indicator	Products and Building Materials	Subcontracts
Difference between the traditional process average price index and econstroi.com price index:	7%	2%

Table 16: Price reduction (%) due to econstroi.com utilization.

(Source: Mota-Engil Engenharia e Construção S.A. – Procurement Process Diagnosis)

“Streamlining the purchasing process...”

Since it started to use econstroi.com, Mota Engil has been constantly preoccupied to objectively measure the results obtained by using econstroi.com both from a qualitative and quantitative perspective.

The savings in time and value correspondent to the utilisation of econstroi.com for a period of one year are presented in table 17:

Reduction in time dedicated to procurement activities and administrative functions generated by econstroi.com utilisation	Time (working hours)	Correspondent Value
Requests for Proposals submitted	3.053	51.576 €
Proposals Analysis	9.301	157.111 €
Administrative work (copies, prints, document process time and delivery)		23.805 €
Annual Total Savings	12.354	232.492 €

Table 17: Savings achieved due to econstroi.com utilisation.

(Source: Mota-Engil Engenharia e Construção S.A. – Procurement Process Diagnosis)

As acknowledged by Mota-Engil, the success and efficiency of an e-marketplace resides in the utilisation dynamics. The benefits are dependent on the volume of transactions executed and processed online. In fact, the success of any e-marketplace is dependent on the number of companies using the e-marketplace: both buyers and sellers. Increased use of the e-marketplace leads to greater benefits.

“Our company’s regular use of econstroi.com for submitting RFPs together with our elevated utilisation levels, generated new dynamics in the business environment and changes in the construction market, making it more accessible and more competitive.”
(Eng. Rogério Feio, Project Director, Mota-Engil Engenharia e Construção S.A.)

Mota Engil collaborated with Vortal S.A. for bringing more suppliers online. They are aware of the fact that for an e-marketplace to succeed and function like a normal market it has to have a sufficient number of members. For this reason, the company organizes on a regular basis, in collaboration with Vortal S.A., meetings with the supplying companies, in order to stimulate and impulsion the correct utilisation of econstroil.com.

Indicator	Participant companies	Adhered to econstroil.com
Number of participating supplying companies in the workshops promoted by Vortal and Mota Engil	650	68%

Table 18: Workshops Mota Engil – Econstroil.com

(Source: Mota Engil Engenharia e Construção S.A. – Procurement Process Diagnosis)

The Mota-Engil case clearly demonstrates a successful story of a company that succeeded in using econstroil.com and enjoyed all the benefits provided by this. It also demonstrates that the nature and extent of the results are positive correlated to the correctness and dynamism in utilisation. The positive results are in concordance with the academic literature regarding the possible advantages of electronic marketplaces.

B. Supplier Perspective – Gondepac Success Story



Gondepac Lda. is a Portuguese company which covers the area of heavy construction equipment rental and leasing, which started operating four years ago but relies on its manager's experience of more than 30 years in the area. Possessing a very good market share corresponding to the fourth position, it supplies an extended range of brands like Boshe, Horpe or Alba. The company's policy is to offer the best possible service to its customers. Gondepac has a strong business relationship with five important contractors, but its interest now is to increase its portfolio of clients.

“Things do not just fall from the sky and do not just happen at a blink of an eye, there is another type of action involved; and this is stated by someone with more than 30 years of experience in the business [...]. The right way to work is to respect your client’s desires, specify exactly what your offer is; basically, develop a relationship of trust with your business partner.” (Artur Carvalho, Manager, Gondepac Lda.)

The case of Gondepac Lda will be used as a representative case for the supplier experience with econstroi.com. Suppliers benefit from econstroi.com just as buying organizations do. Sales and marketing efforts to gain new customers, as well as retain old ones, involve significant expenses. Increasingly, the buyers’ expectations increase so as the necessity for value added services and real time response. Suppliers are expected to have compatible information systems to seamlessly integrate with buyers’ systems. As competition increases in the construction sector, more will be demanded from suppliers.

Mr. Artur Carvalho recognizes this new reality, as well as the fact that his work has become dependent on econstroi.com, because of the relationship with its customers. The company cannot afford to miss a single opportunity to answer a request for proposal from a regular customer because of the importance attributed to the relationship:

“It is not possible anymore to work without an Internet connection or without econstroi.com for three days like it happened some time ago...it is unthinkable. We cannot afford not to answer.” (Artur Carvalho, Gondepac’s Lda. Manager)

When Gondepac Lda started to use econstroi.com, was aware of the fact that econstroi.com can open some doors towards creating new business relationships with companies it hadn’t worked before. The manager of Gondepac Lda confirms an increase in the number of RFPs received via econstroi.com in less dynamic areas and recognizes the fact that there is a general increase in the utilisation of econstroi.com. On the other hand, Mr. Carvalho acknowledges an increase in the process transparency, which comes from the track and trace possibilities and online registry of all information. The fact that all suppliers have

access to the same information, guarantees a certain level of equality in the opportunities they receive and good competitive environment.

The commercial team is composed of five persons, and the team's profile and efficiency have changed since they started working with econstroi.com. The time spent on qualitative functions has increased (like more time for negotiation, for improving the relationship with the customers); in the same time, bureaucratic tasks, duplicated work and document administration receive less attention.

Regarding the utilisation policy, Gondepac Lda. has the same attitude as Mota Engil. Mr. Carvalho admits that the success of any e-marketplace is connected to the degree of utilisation on behalf of the buyers and suppliers. That is why he supports the efforts of Vortal S.A. team to promote correct utilisation and good practices.

In the last year of econstroi.com utilisation, Gondepac achieved new business opportunities in the value of more than 170 thousands Euros (approximately 20% of its annual turnover). The value corresponds to 445 adjudications, in a total of 1.196 proposals presented to the buyers, with a success ratio of 37%.

Indicators	Value
% of Annual Turnover transacted on econstroi.com	20%
New clients gained by using econstroi.com	9
The weight of transactions with new clients in the total value transacted on econstroi.com	60%
Success ratio in presenting proposals	37%

Table 19: Gondepac Lda econstroi.com utilisation report

(Source: Gondepac Lda)

8.2. Econstroi.Com E-Marketplace - Relationship Level Impact

This section intends to present the change/impact generated by econstroi.com as an e-marketplace at buyer-supplier relationship level for construction companies. Portuguese companies are increasingly using econstroi.com to ensure competitiveness in the construction marketplace and to survive competitors who are adopting this strategy. By being connected to the Internet world and its network of relationships, econstroi.com makes

it possible for buyers and sellers to interact on a more global basis. It also makes it possible for firms to organize their value chains, the purchasing and selling activities in real time and to discover new business opportunities irrespective of region.

8.3.1. Relationship Success Within Econstroi.Com Context

As it was presented in the second chapter, there are four essential reasons for supplier relationships: increased cost efficiency, increased effectiveness, enabling technologies and increased competitiveness (Sheth and Sharma, 1997). All these aspects have to be adapted to the characteristics of the purchase situation in the construction value chain.

One of the missions of econstroi.com is to simplify procurement processes by providing web-based solutions that streamline information sharing among all participants, thus driving cost reductions in the supply chain, better information flux and cooperation.

Both buying and supplying organisations reported an improvement in their relationships. As it was presented in Chapter 4 – dimensions of analysis - the study of the changes in the buyer-supplier relationship will follow three directions: negotiation effects, streamlining processes and new opportunities (see figure 41):

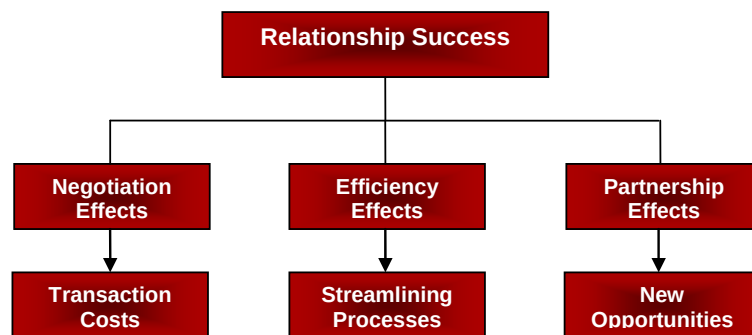


Figure 41: Relationship success– econstroi.com effects
(Source: Own elaboration)

I. Negotiation Effects

One of the most important benefits of the Internet and implicitly of econstroi.com is that it dramatically increases the speed and quality of communication between business partners

while, at the same time, reducing costs. Many of the old communication barriers have been substantially removed and communication between companies anywhere in the country has become online and real-time. By using econstroi.com as an e-marketplace, companies can supply the market with more information about themselves, their products and services, which gives their business partners more and better information in a more convenient format than before.

“Using the econstroi.com technology resulted for us in quantifiable benefits in terms of lower costs, increased revenues, reduced overheads, greater efficiency and we were able to better satisfy our customers...” (Supplier Statement)

One of the most significant results of faster communication is lower transaction costs which were presented in more detail in the previous section. Companies benefit from lower transaction costs and the decrease in costs takes place at all stages of the supply chain, and with all the players involved. According to Antonio Lima, these reductions in costs lead to lower prices, greater output and higher productivity.

A significant answer from an interview demonstrates the negotiation effects of econstroi.com: basically it removed some of the daily routines of the procurement personnel, allowing them to spend that time on more efficient and complex activities.

“Q: Econstroi.com adoption replaces the buyers/sellers or only redefines their roles: In case it redefines their roles, how does this happen?

A: Yes. The buyers can dedicate themselves to rather noble activities, in other words: negotiate instead of having bureaucratic work.” (Buyer Statement)

For sellers, the negotiation effects mean the possibility of finding new customers and increasing sales, leading to market expansion. For buyers, negotiation effects mean an increase in the number of suppliers, and savings on purchasing costs. It is basically an improvement in the bargaining power of participants.

II. Efficiency Effects

“More and more, information becomes more powerful and is recognised as a major part of the cost structure the construction industry. We have to consider the transmission of information between the business partners [...]. These areas in construction are important: the quantities of information are vast, the supply chain is highly fragmented and the level of complexity is high. Econstroi.com offers the potential for transferring information accurately and quickly, in real time, obtaining not only cost savings but also benefits in the buyer-supplier relationship: the buyers can better reach their suppliers and send all specifications and suppliers can better serve their customers.” (Paulo Craveiro, Account Manager, Vortal S.A.)

According to the interviews, econstroi.com offers other benefits for its customers, besides the potential for reducing transaction costs at inter-firm level, increasing the speed and reliability of transactions. It is a good instrument for reducing inefficiencies resulting from lack of co-ordination between firms, respectively in the buyer-seller relationship:

“We started using econstroi.com because we had to adapt to the requirements of our most important customers, since they were using econstroi.com for submitting their requests for proposals. Since that time, we realised that the communication process between us and our clients is easier, it happens in real time and we can build closer relationships with them. In truth, we also receive RFPs in the traditional way, via the fax machine, but now we have more opportunities, we can discover new customers and it is easy to use.” (Supplier Interviewed).

According to the academic literature and confirmed by the interviews conducted, information is recognised as a major part of the cost structure in construction: the quantities of information are vast, the supply chain is highly fragmented and the complexity is high. From this perspective, econstroi.com has proved itself to be a very good instrument for real time information flow, transferring information accurately and quickly. Faster

communication made it possible to achieve process improvements both at the firm level as well as at relationship level. This means, creating virtual networks that link all firms in the construction industry, making possible the existence of a one-to-one relationship in a many-to-many context. Another important aspect is the electronic processing of transactions which lowers costs and leads to higher productivity levels.

The fragmentation of the construction industry is a challenge in itself for Vortal S.A.

“A number of pressures like technical complexity, specifications, specialisation of the work, the increase in the number of companies working on a project, quality pressures, etc., have motivated us to create of a platform that effectively integrates all the above. Our desire is that econstroi.com succeeds in bridging the communication between our customers. We are constantly trying to see both sides of the coin: we hear the buyers as well as the suppliers and we try to create products that better serve the interests of both.”
(António Lima, Administrator, Vortal S.A.)

Both buying and supplying organisations reported a reduction in errors in the orders placed via econstroi.com, compared to their pre-existing procurement procedures. This reduction in errors has directly resulted in an improved relationship with their trading partners:

“Our relationships with suppliers have improved. We used to waste time talking periodically about payments, specifications and things. But now we get it right first time and can move on to build relationships.” (Buyer Statement)

Another supplier develops this line of reasoning by confirming the importance of accurate and timely data in improving the buyer-supplier relationship:

“One of the most important aspects about our relationship with suppliers is clarity of data. After that a better working relationship is developed.”(Buyer Statement)

Prior to the adoption of econstroi.com, the majority of orders from the buying organisations studied were placed via telephone and fax. Mota-Engil – as it was presented earlier - stated that the majority of their requests for proposals were placed in the above modalities and that they had an entire team for order processing and query handling. Integrating econstroi.com with their order processing and ERP systems removed the need to handle calls, faxes and re-key information. This impacted the nature of the staff involved, changing their profile. An improvement in the buyer and seller relationship has been acknowledged.

III. Partnership Effects

The communication improvement that econstroi.com generated, has led to a general increase in competition at all levels, making it easier for new firms to get started and for small companies to penetrate new markets around the country. Econstroi.com expanded the reach of each individual company, enabling new relationships and access to new customers or suppliers that can directly increase sales and revenues or build more efficient productive structures.

“To expand its business, LusoMapei needed to expand its business opportunities. Therefore, it decided to adhere to econstroi.com. The results were very good. We substantially developed our client portfolio and we started receiving twice as much requests for proposals from the contractors, comparing to the number received before.”
(Dr. Luis Salgado, LusoMapei, S.A.)

According to the interviews conducted with the construction companies, the majority became engaged in e-commerce to reduce transaction costs, improve efficiency and speed in the transaction processes, achieve transparency and expand the reach of possible business partners. Supplying companies started using econstroi.com as a result of their commitment to the relationship with their customers. This is because inter-firm relationships necessitate a match between the two companies, demonstrated by the willingness of both parts to make adaptations in practices, processes or behaviours. This translates into a certain degree of closeness between the two companies. Rapidly, the supplying companies realised an

opportunity in using econstroi.com because of the possibility to reach other customers with whom they hadn't worked before. As a rule, when a buyer launches a RFP, all suppliers registered in that particular area of activity receive the respective RFP. This gives at least in theory equal opportunities to all players involved, contributing to the transparency of the business model. The savings in time obtained by using an electronic tool can be transferred to more negotiation time for the companies involved. Suppliers expect to be treated fairly in regards to having access to the opportunities on the market and econstroi.com offers this kind of transparency by "setting the same rules for the actors involved and the same type of rights and responsibilities." (Vortal S.A.).

By its reach, econstroi.com helped buyers to reach local suppliers according to the projects where they are involved, increasing the potential for new relationships and allowing the buyer to explore more markets. According to the interviews and practice, on the supplier side, econstroi.com has been used as an extension of the sales force, making it more effective. Econstroi.com acts in two ways according to Paulo Craveiro from Vortal:

"Q: How does econstroi.com improve suppliers' sales activities?

A: It has to do with the possibility for new business opportunities, by making more effective the time dedicated to non face-to-face contacts and, on the other side, offering the sales force more time to negotiate. Also, the relational database of more than 32.000 construction companies containing all relevant data, offer the sales force the starting point for new business contacts." (Paulo Craveiro, Account Manager, Vortal S.A.)

After starting to use econstroi.com, a supplier company obtained, according to its manager, "positive results in advertising, negotiation and construction market information and analysis." In the transaction process, econstroi.com contributed to opportunities' diversification:

“We first joined econstroi.com because we feared the consequences of not following our customers and loosing the relationship. We soon realised that we could use econstroi.com for our benefit and to differentiate ourselves from the competition. We realised that we have to adapt to the new business environment, otherwise we could not keep the pace with the new.” (Supplier Statement)

The figure below tries practically to portray all what was said above. By resuming, in the traditional construction process, the buyer has a limited number of suppliers and uses faxes or mails to send the RFPs. In the same time, suppliers receive a limited number of requests from their habitual customers. As a result, there are a number of missed opportunities for everyone involved. Econstroi.com entered the scenery and created a platform where everyone has access to all the opportunities on the marketplace. Afterwards, the negotiation process intervenes in its usual manner, and the buyers have the opportunity to award the best proposal according to their criteria.

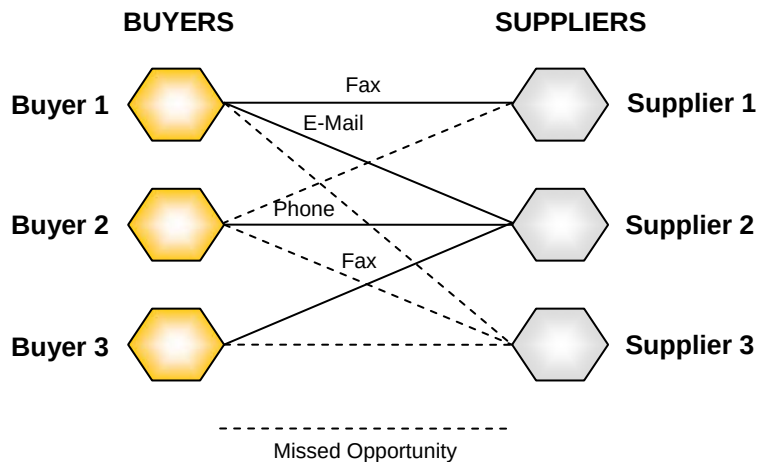


Figure 42: Traditional process in construction industry

8.3.2. The Atmosphere

Econstroi.com provides services, technologies and tools that enable construction companies and their suppliers to compete effectively in the B2B world. The position that econstroi.com assumes on the market is that of an intermediary between buyers and sellers, a bridge that

simplifies the process of communication between the two entities. As a result, econstroi.com's main responsibility is to work with the buyers and sellers in order to promote good practices, transparency and dynamic utilisation.

i. Power/Dependency

According to Filipe Fonte, one of Vortal's Consultants, econstroi.com has to be promoted to the right customers and should be the base for further enhancements. It has to provide good usability and functionality. There is a very important need for customer assistance both on buyer and supplier side, from first contact, through purchase and finally, to after sales and maintenance.

“Q: What is in your opinion the greatest challenge for econstroi.com?

A: Our role as an intermediary between buyers and sellers in the construction sector involves on one side to encourage the buyers to generate more business inside econstroi.com and on the other side, to motivate the suppliers to use it and respond more.” (Filipe Fontes, Consultant, Vortal S.A.)

Power is a very important aspect of buyer-supplier relationships construction. According to the interviews conducted, power is recognized as an important factor that affects the adoption of an e-marketplace such as econstroi.com. The buyer's decision to adopt econstroi.com for streamlining processes has more power on the market than the supplier's decision to adopt econstroi.com as a strategic choice. This means that it generates more adhesion on behalf of suppliers.

The effect of buyer power inside econstroi.com is greater than the effect of the supplier power. According to António Lima, when a buyer decides to start using econstroi.com, he brings an important percentage of its habitual suppliers on the e-marketplace. A supplier's decision to start using econstroi.com doesn't generate the same adhesion, because the majority of the important constructors are already using it. The buyers are attracted by the

cost savings that can be realised and by the decrease in price due to an increase in the competition.

“Q: What are the bases for buyer and supplier power?

A: Buyer power is very much related to the size of the buying company which is directly related to their purchasing volume. Large buyers can exercise their power over the suppliers. On the other side, supplier power comes from two aspects: the image and reputation created by the supplying company and the supplier’s volume of sales to the buyer.” (António Lima, Administrator, Vortal S.A.)

It is important to underline that suppliers are also influenced by their competitors’ actions. As a result, the decision join econstroi.com market is close related to how many of a firm’s competitors are already using econstroi.com.

“We saw that our most important competitors already joined econstroi.com and that was very important when deciding to adhere to the e-marketplace.” (Supplier Statement)

Econstroi.com was founded by some of the biggest construction companies in Portugal, starting with Mota-Engil, one of the most important players on the market. The fact that the biggest construction companies went online, generated an adhesion wave on behalf of their suppliers on the basis of two main reasons: the commitment of the suppliers to the relationship with their customers, as well as the concern with the consequences of not joining. As stated by Kotler in 1994, it costs more to attract new customers or recuperate lost ones than it does to retain existing customers. Suppliers that choose not to participate in e-commerce today could find themselves in an undesirable position of being outsiders in the near future.

However, in reverse auctions, buyers appear to choose those suppliers that can be replaced easily without significant loss and present the best offer. Ordinarily, big driver for closer

relationships is how much of the buyer's business is with a certain supplier, and how important is this supplier to his performance (if it is a key supplier).

ii. Cooperation / Conflict

The potential benefits offered by econstroi.com have been of interest both to buying as well as supplying organisations. Buying organisations envision the use of econstroi.com as access to a wide range of suppliers and as a result better prices. Suppliers find econstroi.com attractive because of an easy and cost effective manner to reach new customers.

Teamwork is a key characteristic of a construction project. Research has shown that inter-organisational cooperation benefits a construction project. According to the interviews, econstroi.com positions itself as the point where value creation and information technology meet and enable interorganizational connectivity.

“Q: What about the companies’ willingness to cooperate?”

A: Without any doubt, companies are willing to cooperate and the single fact that many suppliers decided to follow their customers and respond online to the buyers’ RFPs demonstrates an enormous change in their attitude.” (José Cidras, Project Manager, Vortal S.A.)

The atmosphere inside econstroi.com e-marketplace is shaped by the patterns of interaction and their associated outcomes. A very important aspect of cooperation is the question of privacy and trust. “Many privacy concerns stem from a fear of the unknown”, says one of Vortal’s consultants. The participation in electronic transactions stimulated companies to rise above many mental barriers. Trust is important, as customers feel that they might loose control over private information when using electronic technologies for transactions.

Vortal guarantees protection over the privacy of its client’s information, by applying technological control techniques which protect the confidentiality of the data.

“Vortal adopts high protection levels by applying procedures and guiding principles in conformity with the ISO 27001 norm, which is an international security standard for information safety. As a proof of the security levels, Vortal’s services have been intensively used since 2001, by more than 3.300 clients, generating more than 534.000 transactions, without any incident in the information security area.” (Vortal S.A. Security Policy)

Vortal had to demonstrate over the years that its services are to be trusted by its customers. Besides achieving and managing client’s trust, Vortal’s consultants had to supervise and strengthen the supplier’s trust in the transparency of the processes and bridge the relationship between buyers and suppliers.

“At first, it was a very difficult task. We had to make credible an intangible product. The companies are very different from each other, in terms of internal development, structure and openness to the new. Imagine, there are companies that started to use the Internet because of econstroio.com. And it was difficult to make them believe that the buyer will award a project to the company that sent the best offer. Time worked in our favour and helped us demonstrate our services.” (António Lima, Administrator, Vortal S.A.)

The slow uptake of e-business in construction and inertia of small and medium enterprises to change has pushed them to continue operating in the traditional manner. Many organisations in the construction industry rely on “trust” and trust is commonly developed over time. The fear to trust relationships not being developed on a face to face basis has been identified as a barrier to a better and more dynamic utilisation of econstroio.com.

iii. **Proximity / Distance**

According to José Cidras, project manager at Vortal S.A., responsible also with the relationship between econstroi.com and its customers, the degree of proximity between buyers and sellers is characterised by two aspects:

- On one hand, there is the perception that the use of econstroi.com diminishes the face-to-face interaction between buyers and sellers for routine purchases, performed on a regular basis. All the details of an order are placed inside the RFP, including all the necessary specifications, and as a result, "companies do not loose anymore time dealing with these time consuming details". This turns the procurement process of this type of products less personal and more professional and less time consuming.
- On the other hand, the streamlining of the procurement processes, as well as the reduction in errors in the RFPs submitted via econstroi.com, offer business partners more time to negotiate.

"Q: The contact with your customers is more impersonal now?

A: Face-to-face communication is a very important aspect when we talk to our customers. This improves our relationship and creates bonds [...]. We receive a request for proposal with all the specifications inside and if we have any doubt, we have inside all the information we need regarding the person responsible with that RFP and his direct contacts. This makes the communication easier. We use econstroi.com to maximize the benefits in terms of time savings and new opportunities." (Supplier Statement)

Another important aspect that has to be brought into evidence is that it reduces the technological distance between companies, as it was underlined by António Lima. Both buyers and suppliers can work together using econstoi.com trading platform in a number of distinct ways.

“Q: What is the simplest way to access econstroi.com?”

A: The simplest way is via Web browser. Companies need a computer and an Internet connection. This method of access offers the simplest and lowest cost modality of using the e-marketplace.” (Guilherme Monteiro, Consultant, Vortal S.A.)

It important to mention that all the information is stored online and suppliers can immediately respond to the buyers’ RFPs, eliminating time and geographical barriers between companies. As it was earlier stated by a supplier, the information asymmetries between companies and particularly suppliers are reduced, because everyone has access to the same information. On behalf of econstroi.com, the treatment is equal for everyone and the information that companies have access to, is in accordance to the subscribed services.

“Q: What about the geographical distance between companies?”

A: From the feedback we have had from our clients, econstroi.com offers the possibility for companies all across the country to interact. Buyers discover new possible suppliers. For example two companies from different regions, that have never worked before can develop a new relationship if the buyer has a project in that region and wants to use local suppliers. Local suppliers might be able to offer lower prices taking into consideration that there are no transportation costs involved.” (Paulo Craveiro, Account Manager, Vortal S.A.)

iv. Expectations

According to a market study conducted by the Institute of Marketing and Research in 2006 regarding the degree of satisfaction of econstoi.com’s clients, more than 80% of them are satisfied with the services. This means that 80% of the clients are satisfied with what econstoi.com has done for their business (for further information, see section 8.3.1, page 167).

One criticism econstroi.com receives from suppliers is mainly related to the reversed auction mechanism and the transaction oriented feature, rather than relationship based. Suppliers complain that:

“From my experience with suppliers, their main complaint is that buyers use econstroi.com to reduce prices.” (Paulo Craveiro, Account Manager, Vortal S.A.)

Econstroi.com has a call centre that functions from 9 a.m. to 7 p.m. where clients can call and receive help in whatever problem they might experience with econstroi.com. The clients call for a various set of reasons, from difficulties in using econstroi.com and for this they receive online help and training, to complaints about their relationship with the buyers. This clearly demonstrates the image that econstroi.com has created as an intermediary between buyers and sellers. Companies call to complain about various reasons and according to the Institute for Marketing Research and the author's own experience, the most frequent are:

- The continuation on behalf of the buyers to use in the same time the traditional procurement process, and as a result suppliers receive the RFPs via fax also;
- Complaints about corrupt utilisation practices on behalf of the buyers;
- Complaints that some buyers are sometimes reluctant to start working with new suppliers.

“Q: How do you explain the reverse auction mechanism in order to respond to suppliers’ complaints?

A: Suppliers perceive sometimes reverse auctions as price only negotiations, but although price is a very important criterion for adjudications, it is not the only one. The technology offers the possibility for proposal evaluation based on the best value. Buyers can take into consideration factors other than price in evaluating a proposal. Those other criteria could include delivery, extra features, payment terms, value added services, and virtually any other element a buying organization might want to consider in an evaluation. Buyers take into consideration the value of the offer.” (Call Center, Vortal S.A.)

José Cidras, is one of the consultants who has worked with Vortal since the very beginning and has a great amount of experience in dealing with customers.

“Q: How do you respond to the suppliers’ complaints?

A: We try to be more than an intermediary by being an extension of our clients’ companies. We try to remember to the suppliers that in an increasingly competitive industry, there will be price pressure with or without econstroi.com.

Q: What do you think about the buyer-supplier relationship?

A: Suppliers and buyers should maintain their relationships as usual. It is a question of perspective: to view reversed auctions as an opportunity, rather than a threat, and to be able to maintain existing relationships and build new ones. Even when suppliers submit a proposal but do not win the project, they have established relationships with a buying organization and personnel within that firm. These relationships are valuable for future business opportunities and contacts. The auction provides the supplier with valuable information and experience. Therefore, an auction should be viewed as one component of a relationship.” (José Cidras, Project Manager, Vortal S.A.)

8.3. Econstroi.Com E-Marketplace - Industry Level Impact

8.3.1. From E-Commerce To E-Construction In Portugal

This section intends to summarize the effects of econstroi.com as an e-marketplace in the construction industry, and present some data to support the findings.

Econstroi.com was formed five years ago by some of the most important Portuguese contractors, together with key technological and financial partners, and established online trading capabilities. It was initially designed to link buyers and sellers, via the Internet, with the primary objective to reduce the cost of the procurement process.

The continuous development of the project since its first years of activity is confirmed by António Lima from Vortal S.A.

“The Portuguese construction market was enriched in the year 2000 with an innovative transactional platform represented by econstroi.com. After a six years period of sustainable growth, electronic commerce in the Portuguese construction sector is a reality. In numbers, this means more than 3.200 clients, an accumulated transaction volume of more than 1.500 billions of euros, 1.000 requests for proposals per week, and a daily adhesion of five new companies. “(António Lima, Administrator, Vortal S.A.)

In a sector such as construction, the outlook that e-commerce is unsuitable for the business was, and still is, relatively strong. Small construction firms have been slow, and sometimes even reluctant to use information and communication technology and e-commerce. According to Paulo Craveiro from Vortal S.A., there are various reasons for which companies do not make more active use of econstroi.com, and a couple of them are: preferences for established business models, lack of applicability to the business, the types of transactions in which companies are involved and the relationship with the main customers. Some barriers in using econstroi.com that were encountered:

- Unsuitability for the type of business;

- Enabling factors like availability of technology, skills, qualified personnel, infrastructure;
- Cost factors: costs of equipment and networks, software and re-organisation, and ongoing costs;
- Security and trust factors: companies are still reluctant to the new technologies and the reliability of e-commerce systems;
- Mentality and resistance to new.

In spite of all the barriers encountered, the table below (table 20) summarizes some of the impact that econstroi.com has had on its more than 3000 clients:

Hardware	- Econstroi.com has more than 6.000 users. The majority of the users renewed their personal computer in the last 2/3 years.
Software	- 82% of the users updated their operating system (Windows 2000/ XP)
Networks	- Constructors significantly improved their Internet connection lines. - Suppliers invested in active equipment like routers and modems.
ADSL	88% of the 3000 companies use ADSL lines or better.
Personnel Qualification	- 45% of the constructors representing the shareholders profoundly modified the procurement team's profile, in terms of: management, competence level and academic qualification level. - An important percentage of supplying companies modified the sales department in terms of personnel qualification level.
Training	- 4.000 persons received e-marketplace training, summing up to 16.000 hours.
Processes	- 36.000 consultancy hours for process reengineering. Many constructor companies used Vortal's consultants for the reengineering of their business processes.

Table 20: Econstroi.com impact on its 3.000 customers

(Source: econstroi.com)

Asked how econstroi.com changed the construction industry, António Lima presented a more profound change, in mentality, personnel skills and qualification in order to keep up with the business environment.

“Q: What do you feel about the transformation of the construction sector?”

A: Our journey towards “re-building” or “re-inventing” construction wasn’t easy and it is not over. Building the e-construction wasn’t only a matter of investing in technology. Investments were also required in software, skills development and business process transformation. In my opinion, the use of econstroil.com generated important changes in the organization, its structure and processes and very important, in personnel qualification. These can be seen as important contributors to productivity improvements, cost reductions and revenue enhancements. (António Lima, Administrator, Vortal S.A.)

Overall, industry response to econstroil.com has been positive. The benefits of econstroil.com for its clients are presented below. Needless to say, that more effective communications favours collaboration among partners and more transparency. As they were presented up to now, typical benefits include:

- Communication benefits for buyers include providing relevant information on suppliers and products, price transparency, while communication benefits for suppliers emphasize better information and service to the customers.
- Reduction of transaction costs, time improvements and less bureaucracy.
- New business opportunities for buyers and sellers, since both get access to new partners.
- Integration benefits for buyers and sellers are similar in terms of lowered transaction coordination costs through automation of ordering and procurement processes.
- Overall improved market transparency.

The figure below presents the results gathered from a survey⁵ conducted by the Institute for Marketing Research regarding the levels of satisfaction of econstroi.com's customers. It shows that more than 80% of the companies using econstroi.com as an e-marketplace are satisfied and 92% of them would recommend econstroi.com.

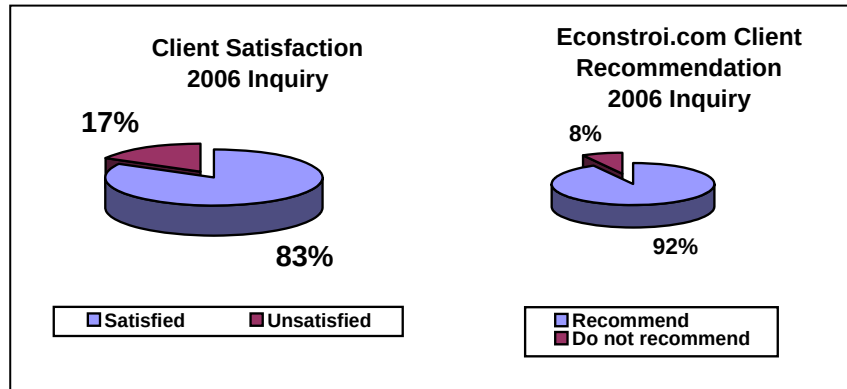


Figure 43: IMR Inquiry - econstroi.com satisfaction and recommendation levels
(Source: IMR and econstroi.com)

Nowadays, we are starting to see the evolution of econstroi.com towards a more sophisticated e-marketplace which undergoes the major opportunity of transforming the construction industry in Portugal. It goes beyond linking a few buyers and sellers because it evolves continually towards providing an environment to link multiple trading networks: buyers, suppliers and other institutions (e.g. public institutions representing public procurement). It represents the next stage of construction towards e-construction and Internet economy, as well as the catalyst for the tremendous growth of B2B trade.

As it can be seen in figure 44, econstroi.com represented a large share of the B2B e-commerce market in 2005 and the most important player on the B2B market (more precisely a percentage of 62%, according to the National Statistics Institute).

⁵ In May of 2006 Institute for Marketing Research (IMR) conducted for Voral S.A. a quantitative study regarding Customer Satisfaction Level with econstroi.com e-marketplace. The study was performed under the supervision of Prof. Dr. Pedro Dionisio. The number of companies interviewed: 329.

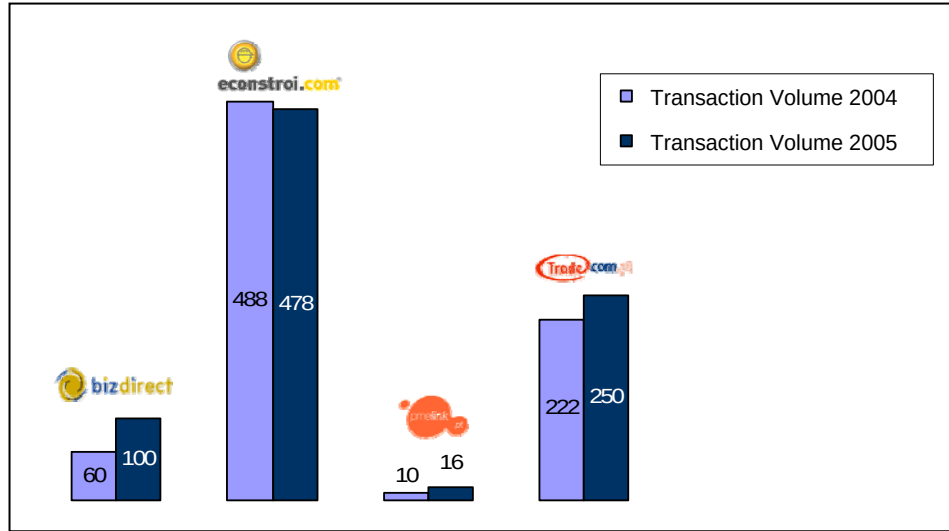


Figure 44: Transaction volume of the most relevant Portuguese e-commerce platforms (millions €)
(Source: National Statistics Institute and econstroi.com)

Econstroi.com is working towards allowing trading partners to integrate with their existing ERP systems, synchronize and optimise the flow of materials, goods and services. The evolution of econstroi.com is parallel with an evolution of the construction industry, and implies a reinvention of the way in which companies and construction industry are structured and operate.

“This evolution will introduce unprecedented levels of market transparency.” (Rui Dias Ferreira, CEO, Vortal S.A.)

8.3.2. Envision Of The Econstroi.Com Network

A very important objective of this thesis is to explain the influence exercised by econstroi.com as an e-marketplace inside the network represented by the companies in the construction industry. Econstroi.com is the arena where companies exchange resources, perform activities and develop relationships. It is important to underline that econstroi.com is an e-marketplace and Vortal S.A. is responsible with setting the rules of interaction and the responsibilities of the actors (see figure 45). With this objective, Vortal’s consultants, as well as some construction companies belonging to the econstroi.com community were

interviewed, in order to understand the articulation between the three essential elements characterizing the network considered in this study: actors, resources and activities.

This chapter intends to reveal the key actors involved in the network, what resources each actor brings and how these resources are combined and used. Activities performed solely or jointly by the actors are also crucial to understand, since they provide an understanding to how the network creates value for each player in the e-marketplace.

In buyer-supplier interaction, technology is one of the critical issues that influence the interaction process. From this perspective, econstroï.com supplies a common technological platform that provides the basic conditions for interaction. Different companies, of different size and structure, interact on a platform that standardizes their technological level and gives each company an opportunity.

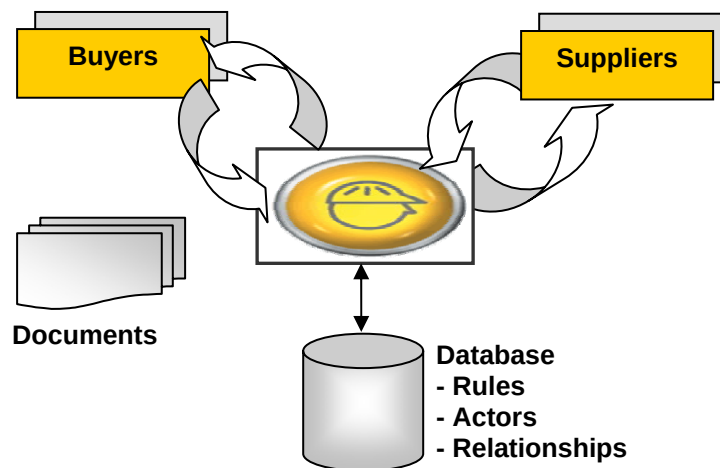


Figure 45: Econstroï.com network

I. ACTORS

Is a win-win situation a possibility for the construction companies both on the buyer and supplier side in the e-business world? The question is being answered throughout the entire thesis and further on in this section.

Companies, as actors in business networks are different from each other in terms of perceptions, knowledge and capabilities and their behaviours change according to their

perceptions, knowledge and capabilities. The construction companies do not act isolated or independent, but are influenced by the behaviour of the others actors in the network.

“Q: What are in your opinion the main actors in the construction industry that joined econstroi.com e-marketplace?

A: The big and medium size contractors and their suppliers who intend to increase their companies’ competitiveness and longevity. They are committed to the project and struggle for changing old mentalities, traditional processes and individual interests. The actors represent two sides: buy side and sell side, and represent different categories like: architects, engineers and specifiers, manufacturers and distributors, general contractors and owners.” (Paulo Craveiro, Account Manager, Vortal S.A.)

The econstroi.com network increases, as the e-marketplace evolves every year, with new customers and new products, designed to satisfy customers’ needs. The major shareholders in the delivery of construction products and services are being influenced by the use of an e-marketplace and therefore it becomes necessary to evaluate the potential impact. Owners, architects, engineers, product specifiers, general contractors, subcontractors, building-materials and equipment manufacturers, distributors, and dealers are all beginning to understand, confront, and embrace the use of Internet technologies for conducting business. Better project control, streamlined communication, structured collaboration, and e-commerce are all benefits of econstroi.com e-business model. The main actors involved are presented below with some of their main characteristics:

Architects, Engineers, and Specifiers

The architect, engineer, and specifier community is not the most dynamic area in econstroi.com in terms of RFPs submitted by the buyers. Nevertheless, it has benefited from econstroi.com efficiencies. Project design documents can be shared electronically, access to new general contractors, market information, real time responses, are all benefits that generate time savings, improve market knowledge, and save money. There are many things

to be improved in this area and lots of work to be done by Vortal in order to make this a more dynamic area.

Econstroi.com Categories	Number of Requests for Proposals	Proposals Received	Number of Adjudications	Value of Adjudications	Requests for Proposals Ratio
Support Resources	1.903	6.619	1.531	30.664.590	3,48

Table 21: Support resources category statistics from the 1st of Jan. of 2005 to the 31st of Aug. of 2006
(Source: econstroi.com)

Manufacturers and Distributors

Manufacturers and distributors are also two important elements in the construction supply chain and they represent an important share inside econstroi.com. Manufacturers have challenged distributor effectiveness, because up to a certain point, there is a conflict of interests between the two, since they are addressing the same target sometimes. Using econstroi.com, manufacturers can obtain efficiencies for major jobs and also get access to new customers. Since the distributor adds little value sometimes, the manufacturer wins by keeping part of the distributor's margin opportunity. On the other hand, entering in competition with the distributors, manufacturers run the risk of losing business on small to medium jobs. A distributor being bypassed on large jobs by a manufacturer may no longer favour the manufacturer on small to medium jobs. Another consideration is subcontractors that buy through distribution and install the products.

Between all these three types of actors there is a state of conflict and cooperation in the same time that has to be managed because of the strong dependency existent between them.

In order to remain successful, distributors must be aware of their market strategy. They need to provide a competitive offer, present value added services, actively market, sell, and service the customer base, have an active sales force that reaches the target community. Econstroi.com positions itself as an extension of the sales force as it was stated earlier by Jose Cidras from Vortal. If distributors do these things, manufacturers are supporting them. While distributor margins are being challenged, the use of econstroi.com as a means of adapting to the customers' practices as well as reaching new customers will bring efficiencies to the channel that will lower distribution costs.

Manufacturers are realizing cost reductions on the supply-side purchases of commodity, raw materials through online auctions and exchanges. Manufacturers may gain an advantage with national account agreements. E-business efficiencies will help manage this process.

Econstroi.com Categories	Number of Requests for Proposals	Proposals Received	Number of Adjudications	Value of Adjudications	Requests for Proposals Ratio
Products and Building Materials	23.805	117.629	19.625	311.379.646	4,94
Services and Subcontracts	6.030	22.691	2.772	330.650.644	4
Supply and Maintenance of Equipment, Machines and Tools	16.479	59.201	15.965	38.255.629	3,59
Total	46.314	199.521	38.362	680.285.920	4,10

Table 22: Products, services and equipment categories statistics from the 1st of Jan. of 2005 to the 31st of Aug. of 2006

(Source: econstroi.com)

General Contractors

In the construction value chain, the general contractor is in a control position. Efficiencies gained by streamlining collaborative processes with the design team and owners reduce construction project time, increase productivity and lower costs. Econstroi.com enables general contractors to choose subcontractors from a larger group of qualified ones. If the job is large enough, e-procurement will lower material costs significantly. There are more and more general contractors that entered econstroi.com e-community for better collaboration, enhanced communication processes, and commerce opportunities. The greatest Portuguese constructors are already using econstroi.com.

Owners

The owner isn't a very active part in econstroi.com. In the construction value chain, the owner is the one that requests the construction project, defines the project parameters, provides the funding, chooses the general contractor, and utilizes the completed project. Without a direct relationship with the owner, the other actors in econstroi.com must rely on project relationships with the general contractor to procure work. Since the owner controls

the design and delivery, the overall efficiencies gained in web-enabled construction projects flow to the owner also.

António Lima presents the buyers and sellers in econstroï.com as having both conflicting and mutual interests, derived from the collaborative perspective. This means that the business world can be seen also as a network of interdependences, derived from convergent interests and mutual benefits. This relates to the relational perspective of inter-firm relationships.

“Q: In your opinion, how would you characterise the actors in econstroï.com?”

A: The actors are represented by buyers and suppliers. At a first gaze, it might seem that the main objective of the buyers is to buy faster and cheaper and of the suppliers to sell more and find new business opportunities. And this is not far from the truth. But taking into consideration the nature of the industry, which implies much collaborative work, companies have common goals. The success of any construction project is characterised by a good cooperation between various entities which work together on various projects. Pressures like cost, time and competition are reasons for interdependence between buyers and suppliers as well as between suppliers.”
(António Lima, Administrator, Vortal S.A.)

Interviews consistently suggested that buyer-supplier relationships are close in nature.

“Q: What about the process of interaction between actors? Did the use of econstroï.com diminish the face-to-face contacts between the companies’ individuals?”

A: The realities of the business environment have changed and companies are trying to adapt to them. We intend to be a catalyst for the development of relationships. Nonetheless, the importance of personal relationships didn’t loose importance, on the contrary. The time savings can be used to improve personal relationships.”
(António Lima, Administrator, Vortal S.A.)

Given the configuration of all these aspects, the direction that should be followed by econstroi.com is always very close related to the retention of companies and in the same time getting new companies online, increasing the dynamism and the connection possibilities inside the network.

Q: How do you feel that Vortal should proceed in order to make best use of the capacities of each actor in order to generate the biggest value for the network?

A: First of all, the great challenge is to succeed in raising the number of companies - buyers and suppliers - inside econstroi.com. This is primordial for an e-marketplace's success. Second of all, we must monitor and promote good utilisation practices and award the most dynamic companies. And last, but not least, we have to continue innovating, creating new products and new services adapted to each actor's necessities." (António Lima, Administrator, Vortal S.A.)

II. RESOURCES

Not only companies are interacting inside the network, but also their resources. The relationships between companies are developed around the resources they possess. According to the model proposed and the empirical data gathered, the resources inside the econstroi.com network can be regarded from two perspectives: tangible and intangible, and both types have different degrees of attractiveness for the actors.

From the interviews conducted, was discovered that the resources of a firm are simultaneously used in a number of projects and for that reason they must be coordinated at project level, firm level and also at relationship level.

"We are engaged in the same time in a number of different projects. We have many business partners. Using econstroi.com we have more control over the logistic process and experience better coordination." (Buyer Statement)

A. Tangible Resources

The tangible resources are represented by material resources possessed by companies inside the network, and include the products that are being exchanged. The products represent any artefact exchanged between companies, like: raw materials and component supplies, manpower, equipment or money. Also, tangible resources include all the infrastructure and facilities that second the activities and the production processes and are used to transform the products (like facilities, heavy machinery belonging to suppliers and that are rented to the buyers in order to complete a project).

In the construction sector, resources have the capacity to influence a business relationship because of their impact on the performance of a company. Through relationships between suppliers and buyers, resources are acquired, accessed, and developed into projects. The resource ties in relationships between companies are critical in order to access and transfer the existing resources through sales and procurement as well as for the development (use and production) of resources. According to the interviews, econstroi.com has the capacity to restructure the way how companies buy products, increase the efficiency and reduce costs.

According to the interviews, the buyers find it also easier to find new suppliers.

“Q: Do you feel satisfied with the categories of suppliers that you find inside econstroi.com and how did econstroi.com affect the procurement process?

A: Yes, we have access to every type of supplier we need for the completion of a project, from suppliers of raw materials and equipments, to subcontractors and man force, architects and project managers [...]. As you know, the delivery of a construction project is very complicated because involves a large number of participants. We have to purchase different types of resources from different suppliers and we always have to consider the price. Econstroi.com enabled access to more suppliers receiving our requests, giving us alternative sourcing possibilities. The fact that that the process is automatic helps us a lot and we spare important time.” (Buyer Statement)

The innovation brought by e-constroi.com on the market affected the structure of the transactions. The development of online reverse auctions has created innovative ways of conducting transactions. Value is created through the connection of previously unconnected parties, eliminating inefficiencies in the buying and selling processes. Buyers, as well as suppliers, have more choices and more options to develop a purchasing/selling strategy.

The construction products and services have different levels of importance to the buying organization. Accordingly, the range of possible supplier relationships ranges from purely price-based interactions to situations of increased closeness of the relationship, given the strategic importance of the product which generates sometimes adaptations on both sides. Therefore, in order to maximize the business value of procured products and services, an effective supplier management strategy has become a critical issue.

“Q: What types of products are most appropriate for e-procurement?”

A: The purchases are previously analysed by the technical and strategic area of the company. Normally, purchasing indirect material is very simple and generates cost savings. In relation to the strategic goods or services, giving their importance for the construction project, the decision depends also on long term relationships, suppliers’ qualification, inspections and auditing processes.” (Buyer Statement)

“One of our deepest intentions is to use econstroai.com to consolidate the relationships between our company and a selected group of our business partners.” (Eng. Furtado Marques, Administrator Edifer Construções S.A. – Econstroai.com Success Stories)

The supplier interviewed acknowledged also that econstroai.com can be of assistance to supplying firms in order to exploit their position with their customers. In the same time, the costs of interaction are reduced and the buyer satisfaction level is increasing.

“Q: How did econstroï.com affect the relationship with your customers?

A: We have different relationships with different buyers. Econstroï.com has improved the communication. Now the information is centralised. We exchange an awful lot of information very quickly and I really value that.” (Supplier Statement)

As pointed out by José Cidras, econstroï.com has contributed significantly to a more transparent and competitive construction market. Effective communication in this sector is vital and the e-marketplace was designed to act as a central communication base favouring network communication.

“Q: What is the difference between the traditional procurement and econstroï.com?

A: The traditional construction supply chain is made of business partners and consists of placing goods and services from suppliers of construction materials and equipments, to contractors, then to clients and finally to the end users. With econstroï, the supply chain is no longer the same, and for example manufacturers of materials can readily access contractors and even clients. The result is improved accessibility and connectivity in the construction supply chain. (José Cidras, Project Manager, Vortal S.A.)

B. Intangible Resources

Intangible resources are represented by an immaterial type of resources found inside firms, such as skills, competence, personnel, reputation, organizational structure or routines. Business relationships can also be considered important intangible resources given the amount of business partners required in order to deliver a project. Last, but not least, the information can be considered a strategic resource for construction. Within this context, it is argued that the technology provided by econstroï.com has helped to integrate and leverage these resources in a more innovative and powerful way, delivering a significant source of value.

Econstroi.com bridges the transmission of resources like information, knowledge, specifications, from one party to another.

“One of the greatest human values is the capacity to create: that is, to transform the immaterial into a physical reality. Econstroi.com bridges this two worlds...materializing the virtuality of the new technology into the hands of its users.” (António Lima, Administrator, Vortal S.A.)

From the interviews conducted, suppliers are satisfied with the transparency that econstroi.com brought. The fact that they receive strategic information like: who are their direct competitors, to which company the buyer awarded a project, as well as the track and trace function that shows when the buyer visualises the proposal, turned out to be strategic instruments that help shape the suppliers’ commercial policy. This is a characteristic of the transparency of the procurement process promoted by Vortal.

“Just the fact that I know who my direct competitors are, helps me a lot. “(Supplier Statement)

Resource ties, that connect actors inside the network, blur up the division between companies’ boundaries, the internal and external resources. The importance of the resources exchanged will determine the nature of the relationship: price transactions or close, long term relationships.

III. ACTIVITIES

The activities deployed inside the econstroi.com network are represented by the articulation between actors and existent resources, and explain the interaction between the business partners. The process of interaction is a critical element for performing exchange activities.

In construction, companies carry out projects in which they perform various activities, develop products, produce and process information, purchase and sell. Activities performed

and the ways in which they are carried out are determinants of the costs and revenues of a company.

As presented in the third chapter, activities are divided into transfer activities and transformation activities. Given the nature of construction, and the high degree of interconnection between the actors, when two organizations build up a relationship, some of their activities can become linked to one another. A relationship is built up of activities that connect, more or less closely, various internal activities of the two organizations. This kind of relationship may also affect the way organizations perform their activities, i.e. their activity structure.

A. Transfer Activities

Transfer activities involve the exchange process between actors, respectively transfer direct control over resources from one actor to other actors.

Econstroi.com supports commerce and transaction-related activities through various auction models, possibility for negotiations, support for requests for proposals, trade exchanges for different products and services. The major transaction related functions include: order management, sales management, and various reports. The driving force of this effort appears to be the desire to improve operational effectiveness. The efficiency aspect and its influence were illustrated in the first section as well as in the second section of this chapter.

“Q: How did the exchange activities performed inside econstroy.com influence your company and your business practices?

A: In our opinion, some of the main reasons to adopt econstroy.com were made in order to have a professional presence in today’s business environment. Another objective was to improve the productivity of our collaborators.” (Supplier Statement)

The construction industry was characterized by an information flow mostly paper-based and therefore slow. Such traditional means of communication involve producing numerous

paper copies of documents and drawings. As a result, the management of these loose documents is time consuming and it can generate errors. The documents need to be organized so as to effectively access data when required by users. Thus, the conventional methods of communicating information needed to be updated. The electronic exchange of commercial data can be fully exploited by integrating internal ERP systems with the e-marketplace.

“The contents of a purchase order inside econstroi.com include all the specifications and bills of quantities, therefore we avoid any duplication or re-keying of information. These orders are sent to all the suppliers that provide the respective products or services, and we subsequently receive their proposals. The comparative map proves to be an important assistant in making a decision.” (Buyer Statement)

Also, evidence shows that companies have immediate access to new business contacts and therefore the chance to perform activities with new business partners.

“The opportunity to negotiate with new companies is the immediate advantage of econstroi.com. TMS developed its client reach. The entrance on the econstroi.com e-marketplace, allowed TMS to start negotiations with new contractors, achieving new contracts” (Dr. Jose Carlos Fonseca, TMS Portugal, SA, Econstroi.com Success Stories)

B. Transformation

Through transformation activities, existing resources are changed and new resources are created. It is important to underline that a construction project itself is a complex activity, involving several multi-disciplinary participants: designers, engineers, fabricators, subcontractors, contractors and material suppliers. It is a team effort, which involves several inter-organisational activities and dialogues. A general contractor normally gets together a team of specialists from various areas (plumbers, electricians, carpenters, masons,

landscaper, etc.) to complete the construction project. The choice of the project members depends on several criteria, including, skills, availability, geographic proximity, previous working relationship, etc.

It is in the above context that econstroi.com offers the platform for all these companies to team up in order to complete a construction project.

“Effective communication is vital for the success of a construction project.” (Buyer Statement)

One reason for which construction industry continues to be fragmented, is because of the lack of technological alignment of different members of the supply chain. Econstroi.com provides a common platform and the members of the supply chain do not have to invest in new applications, but can continue to use their existing systems. The only requirement is a good Internet connection.

Activity links are particularly important for project completion. The partners in a construction project make use of standard applications to access, operate and exchange data. The buyers’ requests for proposals as well as supplier’s proposals can include attachments in different application forms, like CAD drawings, photos, catalogues, etc. Geographically dispersed project partners use the Web as a platform. The users can access important information such as specifications, phase of the project, project responsible and their contacts.

“I think, if anything that we are working closer with our customers.” (Supplier Statement)

According to the interviews, econstroi.com reshaped business processes and brought closer buyers and sellers in terms of technological, geographical and organizational aspects.

“By means of the new supplying techniques and particularly the facilities offered by e-marketplaces, we succeeded in anticipating the future. In the construction projects, time and technology are critical factors.” (Eng. José Paulo, Contracts Director, Edifer Construções S.A. – Econstroi.com Success Stories)

8.3.3. Collective Action Dynamics

After analysing the interaction process between actors within the frame of econstroi.com, this last section tries to bring more dynamism to the analysis model. In other words, we will examine the possibilities of interaction for construction companies from the perspective of the issue-based net envisioned by collective action theory.

As it was presented throughout the thesis, e-marketplaces have the capacity to provide “interconnection effects” with important changes and improvements in supply chain networks. In other words, and according to the interviews conducted, a higher “level of synchronisation” between the business partners is achieved. More than this, the possibilities of integration with existing ERP systems, makes it possible to act collectively in the supply chain.

“Q: In your opinion, how does econstroi.com enable construction companies to act collectively?

A: Econstroi.com is about trading, information sharing, common standards, common culture, same rules for everyone, coordination of information flows [...] More than that and besides the efficiency effects that we have proved to our customers, an important effect is that we bring companies closer. The scope of our services can be described as: commerce, content and collaboration” (António Lima, Administrator, Vortal S.A.)

According to António Lima, the scope of econstroi.com’s services can be described as: commerce, content and collaboration (see figure 46).

The commerce feature can support procurement transactions along the entire chain of participants: designers and consultants, general contractors, subcontractors, suppliers, manufacturers and public agencies. Econstroi.com enables purchasing activities by making available an entire directory of buyers and suppliers, catalogues, requests for proposal mechanisms, submission of proposals, invoicing and bidding.

The collaboration feature refers to econstroi.com as a space where companies can exchange and have access to project documents, important information related to the status and description of relevant construction projects. Some of the advantages also consider: information management, real time information flow and transparency.

The data content feature refers to the information contained inside econstroi.com which is increasingly recognized as a critical asset. Data content includes construction project information (status of the construction project, project responsible, contacts), company information (all the relevant data) and industry information (industry news).

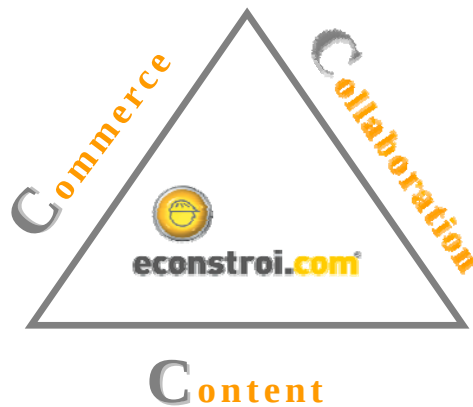


Figure 46: The scope of econstroi.com's services: Commerce, Collaboration and Content

(Source: Own elaboration)

Construction projects are temporary interorganizational networks that exist for the duration of the respective construction project. The team members from one project can be involved in other projects with other business partners. The nature of the relationship depends on the activities carried out inside the project. The parties represent different professions, including architecture, structural engineering, quantity surveying, civil engineering, project

management, etc. Good communication and information flow are a condition for good collaboration between these multidisciplinary teams. Such network structures support improvements in communication and interaction between project partners.

“Q: What is the value proposition of econstroi.com?

A: We would like to assist companies in adapting themselves to the new business environment. Our effort resulted in the establishment of a network of communication which facilitates the operations of the construction parties. Since in any construction project there are different players involved, we represent the intersection point of various users, suppliers, and construction firms.” (António Lima, Administrator, Vortal S.A.)

As presented by the president of CERTAR S.A. the efficiency reasons were very important when deciding to adhere to econstroi.com. Also, the most important Portuguese contractors and suppliers use the e-marketplace for commerce and collaboration reasons.

“One of the objectives of using econstroi.com is to try to introduce in our different business areas new instruments, more precisely information and communication technology, which increase the productivity of our staff and as a result our company’s productivity. This was our purpose when adhering to econstroi.com.” (Eng. Fernando Llach, President of CERTAR S.A. - Econstroi.com Success Stories)

Thus, many different players are involved in the processes of design, engineering, coordination, and integration of technology, including architects, consulting engineers, contractors, sub-contractors, and suppliers of materials, products etc. There is close interaction between the business partners. As a consequence of econstroi.com, companies find themselves able to work on common grounds with different business partners in different construction projects (see figure 47).

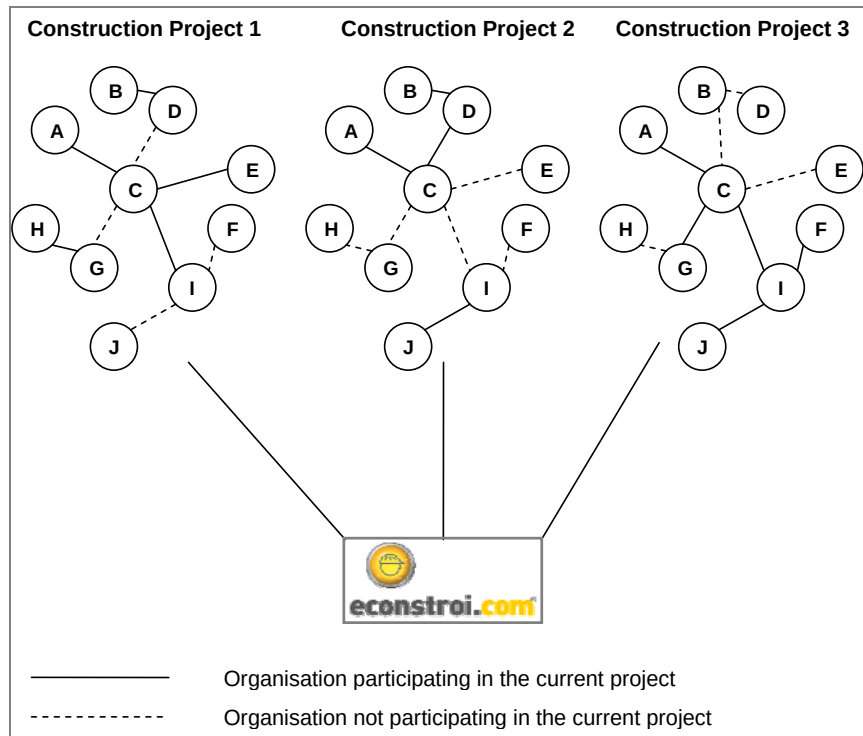


Figure 47: Econstroi.com collaborative network

(Source: Own elaboration)

A very important and innovative project conducted by Vortal S.A. and which enables good collaboration grounds, is related to the buyer-supplier payment system. According to the interviews conducted and Vortal's own research, many suppliers complain that contractors do not accomplish their agreements and delay payments. In association with a financial institution (Banco Espírito Santo Leasing and Factoring), Vortal has prepared a new service for its customers which was launched at the end of 2006, to address this particular problem: the guarantying of payments. The service's true innovation is not paying bills, but rather: guaranteeing payments when negotiating the sale and knowing beforehand that agreed payment deadlines will be met. This service is available exclusively for purchases negotiated via econstroi.

"The development and implementation of the Guarantying service marks the development strategy of Vortal SA, whose objective is to cover all the business cycle of econstroi.com's customers. This service will allow us to guarantee the payment of the transactions completed on the e-marketplace." (Vortal S.A.)

The guaranteeing service will bring additional benefits to both buyers and suppliers. Both buyers and suppliers are being involved in this project and this represents a commitment on both parts, realised on the common grounds of econstroi.com. Any delay in payments can cause tension to the buyer-supplier relationship. The resolution of this problem will allow the development of improved relationships. In addition, the suppliers interviewed declared themselves very pleased with the announcement of this new service, since the payment relates to the question of trust between business partners.

“Trust is everything in this business and everybody knows everybody. You do what you promise. If you betray your partner just once, he will never deal with you again and will tell his friends about your action.” (Supplier Statement)

8.4. Final Remarks

This chapter applied the frame of reference developed in chapter 4 to the construction industry, and basically to the three levels of analysis: company level, buyer-supplier relationship level and industry level.

The study showed that in the Portuguese construction industry, some companies are more convinced in using econstroi.com e-marketplace as an efficient and effective business tool, while others are less comfortable with the concept. The main reason at a first glance is the resistance to the idea of new and change. In the same time, the study revealed that managers are more and more aware of the possibilities envisioned by e-commerce which present some tremendous opportunities for construction.

The possibilities of reducing costs and increasing efficiency as well as improving relationships with clients are more and more taken into consideration.

According to the interviews conducted, a growing number of construction companies are using econstroi to: improve and modify their business processes; reduce operational costs, expand markets and have access to more business opportunities; increase revenues; enhance collaborative business partnerships, and strengthen customer and supplier relationships.

The development of e-commerce technologies have been improved significantly in recent years and Vortal S.A. has had a great contribution in the Portuguese construction market with results aiming to improve productivity and information flow as well as communications.

Chapter 9: Conclusion

*“Arriving at one goal is the
starting point to another.”
(Fiodor Dostoievski)*



In the pervious chapter we analysed the case study represented by econstroi.com. The main structure used in chapter 8, was the structure outlined in the emerged frame of reference from chapter 4. In other words, we focused on the analysis of the research questions addressed by this study.

In this chapter, we will summarize the research findings and present some conclusions. The findings will be presented in a brief and form, in order to form a clear opinion of the phenomenon under study. In other words, in this final chapter, the research questions will be answered and, therefore, general conclusions will be drawn. And finally, in the end of this chapter we will also give and outline some further suggestions and recommendations for future research as well as contributions of the study.

9.1. Research Findings

Overall, the findings presented in chapter 8 provided evidence that using the Internet in a B2B setting affects firm performance and inter-firm relationships. Portuguese construction industry presents relevant characteristics like: high degree of fragmentation, complexity of products and services which demands very good coordination and interrelation between companies that at the same time partners and competitors, technology deficiency in the aspect that there is a clear lack of technological infrastructure and technology culture more present in small companies.

The adoption ICTs supported by the econstroi platform is causing profound changes in construction organisations. At the same time, companies are discovering the benefits of good information management. High market fragmentation, high operational inefficiencies

and the need for coordination, represent an ideal environment for the growth of e-commerce in the form of totally new business models. An important cultural barrier clearly exists and ICTs have not reached the majority of companies in the construction industry. But it is clear that companies are moving progressively towards the new Internet economy.

First, the study found that when firms consider the impact of the Internet on their business performance, they define this with reference to sales and market share, cost reductions or profit levels. The findings indicate that econstroi has had positive effects on business performance and so, it should be considered as business strategy. Most interviewees believed that the use of the Internet enables them to effectively and efficiently improve the business processes, their reach to new suppliers or their services. All these benefits have generally enhanced the relationship with business partners. Moreover, interviewees agreed that the Internet has become a strategic part of their overall business activities.

Second, the study found that the benefits of effective and dynamic use of econstroi.com lead to positive outcomes in terms of buyer-supplier relationship. By using the Internet, business partners can build a better understanding of each other through better communication and information exchange. However, it would appear that econstroi.com does not change the general nature of inter-firm relationships, but assists companies in improving business practices according to their purchasing or selling objectives and strategy. According to the interviews, econstroi appears to be a facilitator of inter-firm relationships because it provides a new technological platform which enables companies to develop and maintain relationship with core trading partners and discover new ones.

Third, the study has also showed that the use of Internet improves communication quality and increases the amount of information that can be shared among business partners, favouring collective action. Companies have a larger range of companies to connect to. Interviewees also emphasised that Internet usage plays a very important role in connecting businesses around the vast and fragmented construction industry.

Overall, econstroi.com generated enormous influences in the construction industry, and a brief summary of them is presented in the tables below:

COMPANY LEVEL IMPACT	
Process Improvements	<u>Streamlining processes</u>: elimination of bureaucratic service, cut down repetitive work. <u>Time savings</u> through the streamlining and automation of processes, such as reducing the time spent on evaluating alternatives, selecting, contacting and communicating with suppliers. <u>More rigorousness and transparency</u> produce efficiency, better planning, control, discipline and profits. <u>Efficiency and productivity benefits</u>: by means of automation, integration and information transparency; reduced effort, more flexible and safer processes. <u>Effective information management</u> by centralizing data online where company's procurement professionals have access according to their utilisation rights. <u>More speed in the negotiation process and less administrative tasks</u>, increase the teams' motivation and brings value added tasks. <u>Change in the profile of the purchasing team</u>: new skills, abilities and knowledge at all levels inside a company: a more qualified purchasing person, capable of changing and embarking on new projects. <u>Internal communication and collaboration improvement</u>.
Cost Reduction	<u>Opportunity to reduce search costs</u> considerably because of the general lowering of transaction costs facilitated by the Internet. <u>Increased price transparency</u> on e-markets is generally recognized as leading to increased competition among suppliers, and, in so doing, resulting in an approximation to true market prices and a <u>decrease in prices in general</u>. <u>Opportunity to reduce the cost of integration</u> with existing partners using a common platform represented by the e-marketplace. <u>General reduction in interaction costs</u>: reduction in contact, communication and negotiation costs as a result of the time savings realized. <u>General reduction in transaction and communication costs</u>, by streamlining and automating internal processes (less number of repetitive and redundant tasks).
New Business Opportunities	Buyers have <u>access to a larger and more diversified pool of suppliers</u>; to obtain relatively lower prices, wider product assortments and better quality (possibility for new alternative supplying sources). Suppliers have <u>immediate access to a larger customer base</u> may be used to increase sales without increasing selling costs. Geographically dispersed buyers and sellers find it <u>easier to interact</u> because of the low costs of getting connected. <u>Elimination of geographical barriers</u> as well as time zone differences, allowing companies to reach to new business opportunities. <u>Access for suppliers to higher levels of decision-making authority</u> in buying organizations. <u>Decrease in the entry barriers</u> for new entrants.

Table 23: Synthesis – Company Level Findings

Source: Own Elaboration

BUYER SUPPLIER RELATIONSHIP LEVEL IMPACT		
RELATIONSHIP SUCCESS WITHIN ECONSTROI.COM CONTEXT	Negotiation Effects	<u>Reduced costs of individual transactions</u> like: costs of searching for buyers and suppliers, costs related to gathering market information, interacting, adapting, negotiating, comparing and deciding. <u>Lower prices, greater output and higher productivity</u> <u>Better and faster communication between business partners</u>: the old communication barriers have been removed and communication between companies anywhere in the country has become online and real-time. <u>Better market information and more transparency</u> for the business partners. <u>Greater efficiency</u> and capacity to satisfy customers. The buyers can dedicate themselves to rather noble activities, in other words: <u>more time to negotiate</u> instead of having bureaucratic work.
	Efficiency Effects	<u>Increased speed and reliability of transactions</u> under the same technological platform. <u>Real time information flow</u>: faster communication improves the buyer-supplier relationship: online connection of all firms in the construction industry. <u>Common platform</u> for interaction which eliminates technological barriers between companies. <u>Reduced inefficiencies</u> resulting from lack of co-ordination between firms, respectively in the buyer-seller relationship. <u>The communication process becomes more effective and efficient</u>: reducing the number of interlocutors and in the same time the number of errors made with human intervention. <u>Electronic processing of transactions</u> which lowers costs and leads to higher productivity levels. <u>Diminishes the time</u> people spend in the regular monitoring of the specifications exchanged. <u>Improves coordination and creativity</u>. <u>Centralization of relevant information for both business partners</u> (about the industry, company, practices) and 24 h per day access.
	Partnership Effects	<u>General increase in competition at all levels</u>, making it easier for new firms to get started and for small companies to penetrate new markets around the country. <u>Expanded the reach of each individual company</u>, enabling new relationships and access to new customers or suppliers that can directly increase sales and revenues. <u>Suppliers developed their client portfolio</u>, accessing other customers with whom they hadn't worked before <u>and buyers have access to alternative supplying sources</u>. The <u>buyers have access to local suppliers</u> according to the projects where they are involved, allowing them to explore more markets. The <u>suppliers</u> have been using econstroi.com as an <u>extension of the sales force</u>, making it more effective. <u>Equal opportunities for all players</u>, by automatically sending a buyer's RFP for a determinate area of activity to all registered sellers in that particular area of activity.

BUYER SUPPLIER RELATIONSHIP LEVEL IMPACT		
RELATIONSHIP ATMOSPHERE		<u>General effect on value chain opportunities.</u> <u>More closeness</u> between business partners. <u>Positive results in advertising</u>, negotiation and construction market information.
	Power / Dependency	<u>More pressure exercised by the buyers</u> who have more negotiation power. <u>More competition between suppliers.</u> <u>General increase in exigency levels.</u> In reverse auctions buyers appear to choose those suppliers that can be replaced easily without significant loss. Buyers have closer relationships with strategic suppliers and in this case econstroi.com facilitates communication.
	Cooperation / Conflict	<u>Better cooperation and reduced asymmetry of information</u> between business partners: all transactions and processes are made using the same platform and all players have access to the same type of information. Teamwork is a key characteristic of a construction project: a bigger <u>willingness to cooperate</u> between business partners. Econstroi.com positions itself as the point where value creation and information technology meet and enable <u>interorganizational connectivity</u>. A gradual <u>increase of the trust in the process</u> which enables and facilitates cooperation. <u>Better conflict resolution</u> by increased transparency of the procurement process. Perception of an increased willingness on behalf of Vortal S.A. to provide <u>services that enable cooperation and support the buyer-supplier relationship</u>.
	Proximity / Distance	<u>New possibilities for interacting.</u> <u>Elimination of geographical barriers.</u> <u>More time to negotiate</u> by streamlining procurement processes. <u>Maximization of the benefits from non face-to-face contacts</u>: new business opportunities from online proposals. <u>Access for suppliers to higher levels of decision-making authority</u> in buying organizations. <u>Reduces the technological distance</u> between companies. <u>Procurement process more professional.</u> <u>Less distance</u> between companies.
	Expectations	<u>More expectations</u> on behalf of the business partners. <u>Higher expectations from buyers</u> in terms of price and service quality. <u>Impact on the satisfaction</u> with the relationship. Econstroi.com can be regarded as a <u>technical bond</u> between business partners.

Table 24: Synthesis – Buyer Supplier Relationship Level Findings

Source: Own Elaboration

CONSTRUCTION INDUSTRY LEVEL IMPACT		
Econstroi.com represents the <u>common platform</u> that provides all the conditions for interaction. Different companies, of different size and structure interact on a platform that standardizes their level and gives each company an opportunity.		
ECONSTROI.COM NETWORK	ACTORS	The actors that joined the e-marketplace represent <u>all construction industry categories</u>: architects, engineers and specifiers, manufacturers and distributors, general contractors and owners acting as <u>buyers and sellers</u>. The actors operate on the market according to their business goals and develop the relationships between them accordingly. Interviews consistently suggested <u>buyer-supplier relationships are close in nature</u>. Econstroi.com positions itself to be a <u>catalyst for the development of relationships between actors</u>. The success of the e-marketplace is very close related to the <u>dynamism and the connection possibilities inside the network</u>. Need for <u>services adapted to each actor's necessities</u>. Belonging to a successful e-marketplace is viewed by the actors is like belonging to a <u>business community</u> and this is important for the image of the company. <u>Improved accessibility and connectivity</u> in the construction supply chain.
	RESOURCES	Value is created through the <u>connection of previously unconnected parties</u>, eliminating inefficiencies in the buying and selling processes. A. Tangible resources Econstroi.com is perceived as an instrument which provides more control over the logistic process and enables <u>better coordination of resources</u> at project level, firm level and also at relationship level. The business relationships are influenced by the resources companies possess, because of their impact on the performance of the company. The innovation brought by econstroi has created <u>innovative ways of conducting transactions</u>, increasing efficiency and reducing costs. For buyers econstroi.com proved to be an effective support for developing a <u>supplier management strategy</u>, in order to maximize the business value of procured products and services according to the procurement objectives. For suppliers econstroi.com proved to be of assistance in order to <u>exploit their position with the contractors</u> while reducing the costs of interaction. The interviews validated an <u>improved accessibility and connectivity</u> of resources in the construction supply chain. B. Intangible Resources The technology provided by econstroi.com has helped to <u>integrate and leverage these resources</u> (personnel, reputation, competence, skills, routines) in a more innovative and powerful way. <u>Improved the qualification level of the procurement personnel</u> and the profile of the procurement team. Viewed as intangible resources, <u>new business relationships are facilitated</u> by econstroi.com. <u>Information diffusion and transparency</u> seen as strategic resources are enabled with the use of econstroi.com.

CONSTRUCTION INDUSTRY LEVEL IMPACT		
ACTIVITIES		The process of <u>interaction</u> is a critical element for performing exchange activities. In the construction industry there is a <u>high degree of interconnection</u> between actors who carry out projects in which they perform various activities, develop products, produce and process information, purchase and sell. Activities and the ways in which they are performed are determinants of the costs and revenues of a company. A. Transfer Activities Econstroi.com <u>supports commerce and transaction-related activities</u> through various auction models, possibility for negotiations, support for requests for proposals, trade exchanges for different products and services. The driving force of this effort appears to be the desire to <u>improve operational effectiveness</u>. <u>Procurement process becomes more professional</u> and improvements in the productivity of the procurement team were validated. Companies have <u>immediate access to new business contacts</u> and therefore the chance to perform activities with new business partners. B. Transformation Activities Econstroi offers the platform for all companies involved in a construction project to team up in order to complete it: <u>technological alignment</u> of different supply chain members. <u>Effective communication</u>, which is vital for the success of a construction project, is enabled by the use of econstroï.com Integration with existing ERP <u>streamlines processes and eliminates duplication of work</u>. Econstroi.com can be also used to <u>access important information</u> such as specifications, phases of a project, project responsible and contacts. <u>Reshaped business processes</u> and buyers and sellers brought closer in terms of technological, geographical and organizational aspects.
	Collective Action Dynamics	<u>Interconnection effects</u> with important changes and improvements in construction supply chain networks. Econstroi.com is a network and <u>each connection in the network represents the possibility of a relationship</u>. Confirmed by the interviews is a <u>higher level of synchronisation</u> between business partners. The <u>possibilities of integration</u> with existing ERP systems, makes it possible to act collectively in the supply chain. <u>Information sharing, common standards, common culture, same rules for everyone, coordination of information flow.</u> The scope of econstroï.com services can be described as: <u>commerce, content and collaboration</u>. The <u>commerce</u> feature can support procurement transactions along the entire chain of participants, enabling purchasing/selling activities. The <u>collaboration</u> feature refers to econstroï.com as a space where companies can exchange and have access to project documents, important information related to the

CONSTRUCTION INDUSTRY LEVEL IMPACT	
	phase and description of relevant construction projects. The data <u>content</u> feature refers to the information contained inside econstroi.com which is increasingly recognized as a critical asset: construction project information (status of the construction project, responsible), company information (all the relevant data) and industry information (industry news). Econstroi.com is seen as a <u>network of communication</u> which facilitates the operations of the construction parties: the intersection point of various users, suppliers, and construction companies. Enables <u>better collaboration</u> between multidisciplinary teams. Companies find themselves able to work on <u>common grounds</u> with different business partners in different construction projects. <u>Enables and enhances trust</u> between business partners by launching a new service that guarantees the payments for all transaction realised on the platform.

Table 25: Synthesis – Construction Industry Level Findings

(Source: Own Elaboration)

Throughout the research project, the thesis has tried to answer the main question regarding the impact and dynamics of e-marketplaces, by answering the two operational research questions: “How and why do companies interact using the e-marketplace arena?” and “How can one best describe and analyse the effects of an e-marketplace in terms of benefits (value creation) for the participant members?”

As it was discovered during the empirical study, the e-marketplace empowered by the Internet, creates a network of networks, a global set of connections of computers and implicitly relationships, which enables the exchange of data, news, and opinions. Aside from being a communications medium, it has become a platform for new ways of doing business, conducting transactions and enabling learning and knowledge generation. The Internet is a many-to-many communication medium which enables a global set of connections, and each connection represents the possibility of a relationship.

On the construction industry level, the e-marketplace made possible better and cheaper access to knowledge and information. This speeds up transactions and processes and reduces their cost, which in turn benefits each company and implicitly the relationships created between buyers and sellers. The ability of ICT to traverse time and distance allows companies to interact with each other in new ways, distance being no longer the main consideration.

The e-marketplace enabled by ICT reduces transaction costs significantly. Companies more easily and more cheaply gain real-time access to the information they need to make sound decisions and to coordinate complex activities. This new information economy impacted on the construction industry, having impact on the competitiveness of companies. This depends mainly on their capacity to adapt, generate, process, and apply efficiently the new information technologies.

9.2. Contributions

The special value of this study comes from the detailed literature analysis of all three areas of impact, which is the basis for the development of the theoretical framework. In scientific terms, the thesis contributes to the enlargement of the knowledge in the area of information and communication technologies applied to the area of e-procurement, e-commerce and interaction between business partners using the Internet. It is designed to provide a better comprehension of the benefits that e-marketplaces, as instruments for e-commerce and e-business bring for the business partners in the supply chain.

The network vision of electronic marketplaces focuses on the relationships and communication infrastructure of organizations and groups of organisations which are connected in some way, enabling collective action. From this point of view, the thesis reveals that there is an enormous potential for the development of electronic commerce in the construction industry. Due to its high degree of fragmentation, the construction industry can be digitalized. Although there are some cultural and technological barriers, Portuguese construction companies started to embrace e-commerce strategies. This study can help the industry to gain better understanding of the impact that e-commerce has had on these companies and the benefits that can further be achieved.

This research proposed an understanding of the effects of e-marketplace adoption studied at three levels of analysis (company, relationship and industry level). Within this context, it tried to evaluate the nature of the relationships.

One of the strong points of this study is represented by its interdisciplinary character which results from the meeting point between business marketing literature and technological topics and belongs to a field that is currently under enormous attention.

From the managerial point of view, B2B e-marketplaces can represent the possibility for optimum cost savings and new opportunities for business benefits. Companies have to recognize the high importance of a detailed analysis of the new possibilities in the procurement area offered by the Internet and ICT. There were presented contributions that could stimulate e-business adoption by a greater number of companies in the construction industry, and why not, stimulate adoption in other industries, since the objective of econstroi.com is to expand its reach towards new markets.

A clear understanding of the benefits associated is necessary for both, buyers and suppliers, to be able to evaluate if e-marketplaces are appropriate for their business practices. The thesis has emphasized the necessity for continuous training on the job and the impact on the qualification level of the employees.

The study can help managers realise the importance and connection between qualified personnel and the introduction of ICT for conducting business processes. These are important management decisions to prepare the environment for successful e-marketplace operations. However, an effective e-strategy is highly recommended to all construction companies in order to adapt to the new business realities and remain competitive on the market.

9.3. Limitations Of The Study

There are some limitations of the study, which at the same time open the door for further research.

In the evaluation of the present study, reliability of the findings is difficult to prove. This is because qualitative research includes a great amount of interpretation on the part of the researcher. It is not easy to say whether the data collection could be repeated with the same

results. However, in order to increase the validity of the findings, the interviews and the results were backed up with quantitative data.

Another limitation of the study is related to external validity which refers to establishing the domain to which the study's findings can be generalised. For this reason, further research is needed to test the theoretical framework proposed in this paper. Specifically, further work is required to validate and generalise the findings to broader settings, using a survey methodology. With focus on a qualitative research in this study, it is strongly recommended to run another research with quantitative methods to probe deeply on each items mentioned. Another research of quantitative focus could confirm each effect mentioned in this study and explore the unknown aspects.

However, the study was carefully designed so as to offer the possibility to extend the results to other industry. Firstly, the choice of the specific industrial setting, the construction industry, was made carefully in order to allow a multifaceted view of the phenomenon under study. Secondly, the richness of the data obtained in the present study points towards the potential to apply it to other industries.

The richness of the data was increased by employing an empirical study at three levels of analysis for a thorough understanding of the phenomenon, by use of a series of in-depth interviews of different types of actors within the industry, and by an exhaustive review of secondary data concerning the industrial setting of the study.

9.4. Future Research

The findings in this research are limited to the construction companies that effectively use econstroi.com. The impact of the Internet and e-marketplaces may differ from an area of activity to another and even from business to business. An industry characterised by a certain degree of Internet adoption (greater or lesser) is likely to have different patterns of communication and, in turn, embrace different effects from e-marketplace adoption. The study focused on the construction industry. Therefore, there are possibilities for studying other industries and see if the results are confirmed and to validate them on a broader basis.

Another area of future investigation could be represented by the possibilities of e-marketplaces to integrate more industries and examine the possible efficiencies and implications.

There is still need for further research to examine these new concepts entirely. B2B e-marketplaces are still in their early days and an anticipated rapid future development should offer various cornerstones for further research areas.

9.5. Concluding Remark

After the research project that I have gone through, I can say that it is only now that I am equipped to discuss the questions I have raised in the study on a completely different level. From this point of view, one could say that the research process has been successful and that there is still a lot of research that has to be done in this area.

And this is only the beginning...

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APPENDICES

Appendix A: List of secondary data used in the empirical study

Appendix B: Interview themes

Appendix C: Econstroi.com managerial reports

Appendix A:

List of secondary data used in the empirical study

http://www.anacom.pt	Autoridade Nacional de Comunicações (ANACOM)
http://www.aiccopn.pt	Associação dos Industriais da Construção Civil e Obras Públicas
http://www.comercioelectronico.pt	Associação do Comércio Electrónico em Portugal (ACEP)
http://ww.compras.gov.pt	Compras.gov.pt
http://www.econstroi.com	Econstroi.com
http://eiu.com	Economist Intelligence Unit
http://ec.europa.eu/enterprise/ict/index_en.htm	European Commission, Enterprise and Industry
http://europa.eu.int/information_society/index_en.htm	European Commission, Information Society
http://epp.eurostat.cec.eu.int	Eurostat
http://www.emarketservices.com	
http://www.emarketservices.com/clubs/ems/prod/E-Business%20Report%20Portugal.pdf	E-business in Portugal - Report
http://www.emarketservices.com/clubs/ems/artic/SignificanteMarkets.pdf	Significant E-marketplaces
http://www.ine.pt	National Statistics Institute (INE)
http://www.oecd.org	Organisation for Economic Co-operation and Development (OECD)
http://www.vortal.pt	Vortal S.A.
http://www.unic.pt	Agência para a Sociedade do Conhecimento (UMIC)
http://www.wto.org	World Trade Organisation

Appendix B:

Interview themes

The interviews conducted at Vortal S.A included the following themes:

- ☒ The understanding of what econstroi.com represents;
- ☒ The biggest challenges of the project;
- ☒ The most difficult obstacles;
- ☒ The delimitation between the actors in the construction industry as they joined the e-marketplace: industrial structure of the sector;
- ☒ The profile of the econstroi.com client;
- ☒ What was the feedback obtained;
- ☒ What is the impact that econstroi has had at company level, buyer-supplier relationship level and industry level;
- ☒ What the future reserves.

The interviews conducted with the buyers/sellers included the following themes:

- ☒ The buyers'/suppliers' perception of econstroi.com;
- ☒ Impacts of Internet and econstroi.com;
- ☒ Role of ICT and internet in the company's operations;
- ☒ Customer relationships in general;
- ☒ Customer relationships governed by econstroi.com;
- ☒ Supplier relationships governed by econstroi.com;
- ☒ The relation between business strategy and objectives and the possibilities envisioned by econstroi.com;
- ☒ Levels of satisfaction.

Appendix C:

Econstroil.com Managerial Reports

