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Escola de Economia e Gestão

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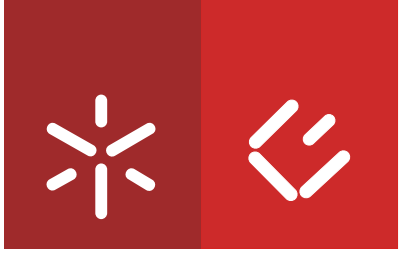

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Strategic assessment of product policy in the marketing of e-commerce companies

Doctoral thesis in Business Administration

Work conducted under the guidance of:
Professor Cláudia Maria Neves Simões

August 2019

DIREITOS DE AUTOR E CONDIÇÕES DE UTILIZAÇÃO DO TRABALHO POR TERCEIROS

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

ABSTRACT

The fast growth of the Internet-based economy has been mainly characterised by the emergence and impact of both information-technology products and virtual transactions upon businesses and communication. Research in the area has subsequently focused on evaluating the frameworks of online business portfolios. Notably, most studies carrying out an investigation of different aspects of the e-commerce paradigm have focused on the nature and effectiveness of online marketing structures, therefore overlooking a detailed understanding of the effectiveness of product policies employed by the vast majority of e-commerce companies.

This research study addresses the gap which exists in e-commerce business portfolio literature by evaluating the effectiveness of product policies employed by e-commerce companies. The analysis begins by identifying the theoretical institutions that define e-commerce companies and how firms can maximise profits with selected factors that reduce their transaction costs. The empirical section of the research begins with a first study that utilises data from a leading software source, more specifically, the download.com platform, which contains data on the downloads from the majority of companies offering software products globally. Findings reveal that consumers have strong preferences for free products over paid products. Critics' reviews and assessments and users' reviews both have significant positive relationships with product downloads for both free and paid software. The factors with the largest positive associations with product downloads, of both free and paid software, are advertising and branding. Finally, advertising for paid products has the largest association with higher downloads. The second study employs a longitudinal approach by using companies' financial data for a period ranging from 10 to 14 years to assess the effectiveness of e-commerce companies' product policies. The empirical results support the economic premise that the most efficient companies satisfy the optimality condition that a firm's marginal costs equal its marginal revenue. The findings from the research offer relevant, in-depth insights for theory as well as for managers/practitioners and education.

Keywords: E-Commerce; Product competition factors; Transaction costs.

RESUMO

O rápido crescimento da economia baseada na Internet tem-se caracterizado pela emergência e pelo impacto dos produtos ligados a tecnologias de informação e transações virtuais. A investigação na área tem-se focado em avaliar as carteiras de negócios on-line. Notavelmente, a maioria dos estudos que realizam uma investigação sob diferentes perspectivas ligadas ao e-commerce têm-se concentrado na natureza e eficácia das estruturas de marketing on-line, portanto, ignorando uma compreensão detalhada da eficácia das políticas de produtos empregados pelas empresas de comércio eletrónico.

Este estudo borda a lacuna que existe na literatura de portfólio de negócios de e-commerce ao avaliar a eficácia das políticas de produto desenvolvidas pelas empresas de e-commerce. o estudo identifica as instituições que definem as empresas de e-commerce e como as empresas podem maximizar os lucros com fatores selecionados que reduzem os seus custos de transação. A seção empírica do estudo inicia com um primeiro trabalho que utiliza dados de uma das principais fontes de software, em particular, a plataforma download.com. Esta plataforma contém dados sobre os downloads de empresas que oferecem produtos de software globalmente. Os resultados demonstram que os consumidores têm preferência por produtos gratuitos quando comparados com produtos pagos. Revisões e avaliações de críticos e usuários têm uma relação positiva com downloads de software gratuito e pago. Os fatores com a associação positiva mais forte em relação ao download de software livre e pago, são a publicidade e o branding. Finalmente, a publicidade de produtos pagos tem a associação mais forte com o número de downloads. O segundo estudo realiza uma abordagem longitudinal, utilizando os dados de empresas durante num período de 10 a 14 anos para avaliar a eficácia das políticas de produtos das empresas de e-commerce. Os resultados empíricos sustentam a premissa económica que as empresas mais eficientes satisfazem a condição de optimalidade onde custos marginais de uma empresa são iguais à sua receita marginal. Os resultados da investigação permitem retirar ilações relevantes e aprofundadas para a teoria, assim como para os gestores/*practitioners* e ensino.

Palavras-chave: Custos de transacção, E-Commerce; Fatores de concorrência de produtos.

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Acronyms

APICS – American Production and Inventory Control Society

AMA – American Marketing Association

B2B – Business-to-Business

B2C – Business-to-Customer

CRLC – Customer Resource Life Cycle

CSR – Corporate Social Responsibility

CSRP – Customer Synchronised Resource Planning

CTR – Click Through Rates

EDI – Electronic Data Interchange

EDIFACT – Electronic Data Interchange for Administration, Commerce and Transportation

EFT – Electronic Funds Transfer

ERS – Evaluated Receipt Settlement

GAAP – Generally Accepted Accounting Principles

GNP – Gross National Product

GP – Gross Profit

IBM – International Business Machines Corporation

ICGS – International Classification of Goods and Services

ICT – Information and Communication Technologies

IFRS – International Financial Reporting Standards

ISO – International Organisation for Standardisation

NP – Net Profit

POP – Pay on Production

QR – Quick Response

SABRE – Semi-Automatic Business Research Environment

SME – Small & Medium Enterprises

TC – Transaction Costs

VMI – Vendor Managed Inventory

UN – United Nations

USP – Unique Selling Point

WIPO - World Intellectual Property Organization

This doctoral thesis is specially dedicated to my mother, for her ongoing, unconditional love and support, to my father and grandparents who unfortunately could not see this doctoral thesis completed.

CHAPTER 1. INTRODUCTION

The Internet-based economy has seen tremendous growth over the past few decades and with its development and growth of information-technology products. The literature has explored this growth by examining frameworks of online business portfolios. Most studies have focused on the marketing and categorisation of business to name the largest fields of study. The literature is lacking an evaluation of the effectiveness of product policies employed by e-commerce companies. This thesis aims at exploring the effectiveness of e-commerce product policies and looking at factors determining transaction costs.

This chapter overviews the transactions in the internet-based economy in section 1.1 and giving the purpose and scope of the study in section 1.2. Section 1.3 explains the methodology of the empirical analysis and provides an overview of the relevance of the results. Finally, an outline of the thesis structure is presented in section 1.4.

1.1 Transactions in the internet-based economy

The majority of transactions are converted in electronic format, thus importantly reducing the time and financial component of the transaction cost structure, on the one hand, and establishing new rules of conduct of economic entities on the Internet market, on the other hand (Cheong, Mason, & Vogt, 2006). As a result of this type of a transformation, the competition within the Internet market has been consistently increasing. From this perspective, research on the development of approaches to the marketing activity of e-commerce companies and, in particular, focusing on the issue of effective product policy within the Internet market environment has increasingly become more relevant. In the majority of cases, e-commerce companies are mainly companies which conduct their business activities on online platforms. Under these circumstances, the exchange of products/services and the processing of payment are done online. Unlike traditional companies, which conduct their business operation on a face-to-face basis, where buyers and sellers physically meet for a transaction to take place (e.g. Hong & Zhu, 2006), in the case of e-commerce companies, most business transactions are conducted virtually via the Internet. Hence, when compared to traditional companies, contemporary e-commerce companies operate within a different institutional environment. Given that institutional theory advocates that business organisations in the virtual space (Internet) operate within specific institutional environmental structures (Mueller, 2010), firstly, it is necessary to look differently at the institutional structure of the Internet market; secondly, it is crucial to both identify and examine institutions which impact upon their marketing activity in general; and, thirdly, the overall implementation of product policy of e-commerce companies would need to be analysed. In this dissertation, product policy is defined as the broad guidelines relating to a firm's product-mix by using specific characteristics of products in order to achieve maximum revenue and maximisation of profit (e.g. Kotabe, 2009; Krishnan & Ulrich, 2001; Ulrich & Eppinger, 2012). In other words, product policy describe which products should be sold by online agents, in addition to distinguishing among the product's characteristics.

In the concurrent technological, Internet-based economy, which is dominated by the information product and e-commerce, there is significant urgency for the establishment of new methods that facilitate the adequate selection of product portfolios and also the evaluation of e-commerce product profitability. When e-commerce companies choose the Internet as their primary sales avenue, they tend to adopt new techniques towards assessing their product lines and the performance of online products. As such,

e-commerce businesses ought to review their supporting methodologies, mainly due to the dynamic nature of the Internet-based market. As also acknowledged by Hong and Pavlou (2014), it is vital to note that two examples of techniques which remain significant in the assessment of online product performance include online product forums (e.g. collaborative shopping systems) and website media (e.g. visualisation systems), therefore aiming at reducing product-fit uncertainty among online consumers. It is claimed that these types of supporting methodologies effectively enable e-commerce companies to considerably re-evaluate their product policies regarding the performance of their product line.

Furthermore, Internet-based technologies enable individuals to sell any product in the virtual world. However, there are still a number of gaps and opportunities for research in the fields of knowledge-based economy, e-retailing, and e-marketing, and the overall profitability of online retail for certain products in both previous and current literature (e.g. Hong & Zhu, 2006; Hong & Pavlou, 2014; Mueller, 2010). Consequently, under the existing market conditions, companies should pay further attention particularly to new types of products, namely, information products. The foundation of modern approaches to assessing the effectiveness of information product marketing was laid as early as a few decades ago. Over time, technological dynamics have influenced the framework of information products, especially after the rise of the Internet and e-marketing. As such, technological influences have necessitated a reclassification of the past vision of e-commerce products, e-marketing policies and their effectiveness in sales generation, and e-commerce companies' product portfolios.

This present research study draws upon literature showing not only the importance of transaction costs (the expenses incurred when buying or selling a product or service) within one firm but also their relevance with respect to the transition of a product from a non-online state to an online state. Furthermore, the literature review addresses a number of aspects related to product policy in the marketing of e-commerce companies, where the main concepts of marketing of e-commerce companies (e.g. models, instruments, and methods used by commercial companies in e-commerce marketing) are outlined and analysed (e.g. Bayazit, 2014; Castells & Cardoso, 2006; Reich & Benbasat, 2000). Subsequently, it is proposed that marketing is "the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large" (Lamb, Hair, & McDaniel, 2014, p. 3). As a result, in the literature review, a series of key factors which considerably impact upon product competition of e-commerce companies, such as category and functional characteristics of a product, in addition to advertising, competition and network

effects, product brand and manufacturer's brand, and also experts' and users' opinions, are identified and discussed.

1.2 Purpose and scope of the study

The Internet is available in most countries worldwide and is particularly utilised in developed and developing countries (Baggaley, 2014; Broadband Commission, 2014; He, 2001). The Broadband Commission (2014) estimated that half of the world population is connected to the Internet by 2017. Recent statistics (Broadband Commission, 2014), also forecast that, by 2018, approximately 7.6 billion people across a wide range of global geographical regions will be connected and thus able to access and utilise the Internet on a regular basis.

The growth of Internet usage globally has been occurring rapidly. However, in the developing world, Internet penetration has been evolving at a much slower pace with only approximately 32% of the developing world having Internet access by 2014, while this rate was much higher in developed countries, having reached more than double that rate at 78% (Broadband Commission, 2014). In addition to the commonly-used electronic mail, the Internet frequently facilitates the processes of making both purchases and bank payments via a variety of means, while also enabling a wide range of users to vote, to hold discussions irrespective of their location, to obtain medical advice, to teach and to learn, among many other benefits. Moreover, the expansion of the Internet offers a convenient communication and interaction platform to individuals and as a global market for businesses. As recently as two decades ago, the majority of people across the world were unaware of Internet-based technology let alone the vast range of its applications and benefits. By contrast, nowadays, the Internet is broadly utilised not only as a central means of an area for the placement of advertising by different companies ranging from dwarf business units to giant corporations (Graham, 2001). As an illustration of this, as indicated in the MINTEL report (2011) on Internet retailers, all conglomerates and businesses that have embraced internalisation as a policy tend to use the Internet for advertising and marketing primarily. These types of institutions also utilise the World Wide Web as a medium for promotional activities, a practice which considerably reduces marketing costs while also allowing companies to reach customers globally. Due to this new ability to reach such a broad customer base, the vast majority of companies further use the Internet for direct online selling, research, and development, communication and collaboration, all of which enhance

the development of highly lucrative links and networks established between companies manufacturing (the same) products.

Under the conditions of economic turbulence and crisis developments as well as on account of the global nature of the Internet market, e-commerce companies have tended to gradually experience more and more difficulties in identifying and utilising their competitive advantage. Under these circumstances, mainly shaped by a progressively competitive global market, it follows that the development of a research framework aimed at identifying factors of non-price product competition on the Internet market is of immediate interest and relevance. Moreover, e-commerce companies should focus precisely on those factors potentially carrying the most significant influence on the level of their sales. In particular, factors which would reduce e-commerce transaction costs play a critical role in increasing the level of firms' sales. The Internet has grown in wide popularity over the past few years and even decades. As such, the literature has exploded with research exploring all aspects of Internet commerce, including pricing optimisation (Carvalho & Puterman, 2005; Dube, Borkar, & Manjunath, 2002; Laitinen, 2009; Semret, Liao, Campbell, & Lazar, 1999), marketing models (Chaffey, 2006; Montgomery, 2001; Rust & Chung, 2006; Standing & Vasudavan, 1999; Stewart & Zhao, 2000), advertising models (Rappaport, 2007; Schlosser, Shavitt, & Kanfer, 1999; Zhao & Nagurney, 2008), and many others. Very little has been done to consider transaction costs. Transaction costs are vital to many e-commerce firms as they are almost the most significant drivers of their total costs and can determine profitability. This research seeks to explore firms' transaction costs and the factors that determine them. E-commerce product policies may considerably influence e-commerce companies' sales levels. Therefore, in an attempt to effectively and efficiently assess product policies in the marketing of e-commerce companies, the present research study aims to analyse the effectiveness of various approaches employed. Thus, the main research questions to be explored in this research study include:

- What is the model of product competition, namely, the model predicting total sales, and thus gross revenue, for e-commerce companies?
- What key variables determine the effectiveness of product policies employed by e-commerce companies?
- What impact does marketing have upon a companies' transaction costs?

In light of this, this research aims to identify the factors that define affirmative product policies in the marketing of e-commerce companies. The three main research questions to be explored in this research study are as follows:

- To analyse economic institutions of the Internet environment and transaction costs of e-commerce companies based on their classifications and to evaluate their impact upon the implementation of product policies;
- To design and propose a product competition model for e-commerce companies;
- To propose guidelines for assessing the effectiveness of e-commerce companies' product policies.

1.3 Methodology and relevance of the study

This research is based on the rationality assumption adjusted in the new Institutional economics. An individual is treated as an agent whose behaviour reduces to the choice of the best option among all the available ones given numerous restrictions. In particular, an individual is ignorant about several essential characteristics of a transaction they participate in; and an individual is assumed to behave opportunistically when needed. The main restriction of these assumptions is that they exclude an opportunity of irrational behaviour which a lot of marketing research assume based on observing stylized facts. However, the strength of the assumptions of the new Institutional economics is that they enable a research model in which the behaviour reveal potentially most influential agents on the overall market processes.

The first study examines consumers' preferences for paid versus free software and the factors affecting the download rates of these software. The research uses a data sample of 540 individual software programs, segmented into 15 different categories for the first study.

The second study reviews studies of firms' marketing policies and the effectiveness of those policies on sales. The research employs an empirical analysis based on a longitudinal dataset of German e-commerce companies (Farrington, 1991; Fraley & Hudson, 2014; Menard, 2007). In defining the structure of the Internet commercial institution and the product competition factor model for e-commerce companies, the employed research methodology draws upon a logical framework approach and system

analysis. Linear regression analysis and other econometric models are used to test the framework for assessing the effectiveness of e-commerce companies' product policies. As such, a product competition factor model for e-commerce companies is advocated for.

The analysis focuses on Germany since this particular country contains the largest and fastest-growing share of the e-commerce industry in Europe. Overall, while e-commerce in Europe was expected to grow by 19% throughout 2017, the largest portion of that growth occurred in Germany due to its excellent logistical performance (Ecommerce News, 2017). Logistical performance is essential to e-commerce success as delivery of products purchased online is a significant portion of the e-commerce process. Due to a combination of factors, such as high Internet penetration and Europeans experiencing a high level of comfort paying online by credit card, the performance of logistics in Germany make it a first-rate place for the success of e-commerce in Europe (Ecommerce News, 2017). As such, a sampling of e-commerce companies operating in Germany was selected for the second study. To this end, the present research study employs secondary data collection methods, including document inspection, and retrieves relevant data from a sample of e-commerce companies.

In general terms, this doctoral study contributes to the e-commerce literature by establishing product policy rules followed by firms' and by analysing the development of marketing of e-commerce companies. In this sense, this research attempts to portray information society as a socio-economic system in which products of immaterial labour, including information service, knowledge and information, are at the forefront of economic activities. Whereas information technologies are considered as the primary driver, networks are understood as the prime forms of institutional organisations. Thus, Internet-based organisations are also taken into account within the scope of marketing and institutional approaches, as initially proposed by Mueller (2010).

To provide an in-depth insight into the concept of virtual institutions, the present research reviews a number of essential theories and clarifies the roles different marketing institutions play within the overall system of Internet marketing, particularly through the description of the concept of institutions of the Internet environment (Hodgson, 2006). The description of this underlying concept contributes to the scholarly enhancement of theoretical concepts related to the impact of an institution-based structure, or a structure based upon recurring, valued, and stable behavioural patterns as they interact with the Internet environment (Hodgson, 2006). Thus, this research contributes to the existing literature in the following ways:

1. The research study identifies variables responsible for the effectiveness of e-commerce companies' product policies from the perspective of product portfolio's information structure. This entails the classification of products, based on an assessment of product policy comprising of four phases, through the optimisation of e-commerce companies. To be more specific, the four phases revolve around an analysis of product portfolio, an evaluation of financial performance, a determination of the number of transaction costs, and an assessment of product policy. Further, it is argued that each phase utilises the results obtained from the previous phases. In this sense, methodological support/guidelines facilitate the assessment of the statuses of e-commerce companies' product policies with the aim of identifying means of improvement.

2. The present research study tests and advocates for a product competition model for e-commerce companies considering differences in the implementation of product policy, as evident in the case of paid-for and free of charge e-products. The product competition factor model is thus based on the degree of influence on product policies according to the following groups of factors: those which determine product quality, price, and market share; factors which shape promotional instruments and instruments supporting competitive advantages; and factors to be seen as a condition of the image or brand of e-commerce companies. Consequently, it is argued that the model determines the level of impact which product competition aspects generally have upon the sales level of e-commerce companies.

1.4 Thesis outline

The present research study is divided into six main chapters plus appendices and reference. The first chapter, namely, the introduction, identifies the motivation for the research and the primary goals and findings of the research.

Chapter two contains the literature review, which provides an overview of the research background on e-commerce development, information and network society, covering the work of different scholars including Bell (1976), Beniger (1986), Drucker (2003, 2007), Dyson (1996), Lyotard (2005), Porat and Rubin (1977), Richta (1977), Stehr (2002) and Touraine (1971).

Chapter three presents the methodological support towards the assessment of product policy of e-commerce companies. Specifically, it addresses the following questions:

- What is the model of product competition, namely, the model predicting total sales, and thus gross revenue, for e-commerce companies?
- What key variables determine the effectiveness of product policies employed by e-commerce companies?
- What impact does marketing have upon a companies' transaction costs?

Chapter four continues the research by conducting an empirical analysis exploring the factors that contribute to an online firm's success. The empirical study finds support for the popular claim that product reviews and assessments are critical components in the commercial success of e-commerce companies.

Chapter five examines the research findings related to an assessment of e-commerce companies' product policy.

Chapter six presents the final remarks of the research study and implications for theory and practice. Additionally, it discusses the research limitations and recommends directions for future research.

Finally, references and appendices are presented. The appendices comprise information about the distribution of products, based on informativity and financial results (in Euro) of online stores used in the study. Related to formatting references in the thesis the American Psychological Association (APA) style is used.

In the chapter that follows, we will now outline the existing work in the conceptualisation of assessment of product policy in order to establish the scope of the strategic assessment of product policy in the marketing of e-commerce companies construct.

CHAPTER 2. LITERATURE BACKGROUND

The literature review discusses the various understandings of social and media networks and their organisation at all levels. Additionally, it overviews various research studies which contend that a network society constitutes a prerequisite in those societies of highly developed digital technologies, network communications, and information management, or, in other words, in which technologies form the basic infrastructure of political, social and economic practices. This analytical approach is then followed by linking the ideology of network society to the concept of the information economy so that a relationship with information society is established. Several researchers' input in this area is outlined, and greater attention is paid to both information-related activity and information society. Thus, particular emphasis is placed on the digital economy, which is generally understood as an economy based on electronic and digital computing technologies, as well as on how the digital economy affects e-commerce, products and services. Finally, a discussion of the notion of network economy follows, exploring business-models of contemporary society in which ownership rights belong to a network of economic agents.

Dedicated to the assessment of product policy of e-commerce companies, the third section overviews the classification of economic institutions of the Internet market and transaction costs of e-commerce companies. This is followed by an analysis of specific features, which characterise marketing institutions operating within the system of institutions of the e-commerce market. This is where the present research study outlines and evaluates how various scholars have identified and analysed strategies on how business owners can compete internationally with firms whose headquarters are geographically located in other countries. The third section also identifies marketing institutions that enable companies to operate within a competitive market effectively, such as institutions of B2B commerce, and institutions of auction. In particular, section underlines marketing within e-commerce as affecting an environment where the market is to be based on the principle of isomorphism. Moreover, this section presents a typology of e-commerce companies' transaction costs. Furthermore, the section provides a brief background on economic

transactions, as it focuses on renowned scholars, such as Williamson (1979, 1981), who developed the referential vision of the economy of transaction costs; a vision based on the interrelation of three main aspects of a transaction (i.e. uncertainty, asset specificity and frequency of transactions) and two principles of human behaviour (i.e. bounded rationality and opportunistic behaviour).

2.1 Development of e-commerce

The industrial revolution marked a transformational time in history, as this period was characterised by a shift from labour-intensive manufacturing and production to the use of machines. The first stage is defined according to the first industrial revolution which occurred between the late 18th and early 19th centuries, resulting in a switch to scientifically-based machine production. The second stage typically refers to the second industrial revolution which took place in the late 19th and early 20th centuries. At this particular stage, the development of machinery-based production forces, coupled with changes in power sources for production, was characterised by the rapid development of engine-based science, which further enhanced the switch to production automation. The third stage is characterised by the third industrial revolution in the mid-20th century, which spiralled into the latest scientific and technical revolution. In the 21st century, a series of factors specific to the new fourth stage of the industrial revolution have been initially theorised by Vries (1994) as:

- the transformation of production technology on the basis of electronics;
- the regulation of biological processes and systems on an increasing scale;
- integrated automation of production;
- new types of power systems;
- the technology of manufacturing new materials, among others.

More recently, these types of changes, which initially were called into existence by state-of-the-art technologies, have generally complied with the criteria shaping the latest industrial revolution, namely: changes in production; the improvement of technologies, resulting in an increase in labour productivity; and the formation and development of other types of social life, as illustrated in Table 2.1 below.

Table 2.1 Changes in the social reproduction connected with e-commerce technologies

Stages of Social Reproduction	Scope and Content of Changes in Progress
Production	For the first time, changes in technologies have determined human knowledge and creative abilities to be seen as the primary production force of society. Production plants have appeared, where only engineers and designers and not traditional turners, metal workers and the like are engaged. Plants themselves may be like virtual enterprises by nature, where designers and engineers use teleworking technologies, and material production will be put on robotic devices and machines. Relations between capitalist employers and employees have changed, which is one of the reasons why the importance of the organisational moral environment has increased – it is impossible to create freely under the conditions of exploitation and oppression.
Distribution	New services and opportunities have appeared, which have further contributed to increasing volumes of product turnover, accompanied by a reduction of transaction costs, followed by an increase in global information transparency.
Consumption	The consumption of information products and services has lost spatial reference and instead has become the primary type of consumption (by volumes of product turnover). Therefore, the consumption of tangible products and services is entirely interrelated with the consumption of information associated with these products.

Source: compiled by the author based on Ayres and Kneese (1969), Machlup (1962)

As demonstrated in the above table, the kinds of alterations which originated in breakthrough technologies have conformed mainly with standards delineating the modern industrial revolution. These technological improvements and production changes have resulted in the creation of different societal lives and productivity of labour.

Generally, industrialisation is categorised into three broad types of societies: agricultural (patriarchal), industrial, and post-industrial (information). Accordingly, it can be noted that the prevalence

of service industries over industrial and agricultural production in the structure of the current economy represents an essential feature of post-industrial society, in which case science operates as the central productive power in determining the fundamentals of both social life and state policy. As a result, social living standards, markets (e.g. labour, product, and finance), and systems of management depend, to a great extent, on the usage of information technologies (Cullen & Parboteeah, 2014).

In the 1970s, Drucker (2003) and Martin (1996), among others, began to pay particular attention to the processes resulting in the formation of the information economy. According to these scholars, the explosive growth of information and communication technologies had become the basis for the activities resulting in the information economy's creation, which further resulted in turning computers into the mainstream instrument of industrial labour. Expansion of data communication networks soon followed this and also by the extensive use of information and telecommunication technologies in business processes, trends which have recently given impetus to the development of the now widely recognised phenomenon of e-commerce. Several components of this new economy, such as the creation of digital currencies and electronic payment systems, are still under development. Furthermore, the emergence of a new type of business, based on the usage of electronic technologies and communication capabilities of electronic networks, occurred as a natural phase in the development of the Internet-based economy. E-commerce should then be considered as a form of business, implemented to a great extent by using the integration of information and telecommunication technologies and systems into business processes. The industry involves four main operational phases: marketing (all aspects), production, sales, and payments. Within this context, the extent of the application of information, telecommunication technologies and systems serve as a measure by which any business can be treated as e-commerce. As such, the term of e-commerce is employed in the present research study as referring to a form of business relationship which is either entirely or to a greater extent conducted via the use of computers and electronic networks (Chaffey, 2009).

The global usage of the Internet typically determines the extent of how telecommunication technologies may be applied as an instrument exploited in the organisation of the integrated information environment of e-commerce. As early as the late 1960s, using electronic networks for both communication and data exchange purposes during business operations have become the norm. The emergence and expansion of the Internet have also had an increasingly significant impact upon business in general (Amit & Zott, 2001). The range of commercial relations via the Internet has thus sufficiently expanded for e-commerce to become a part of day-to-day relations between individuals and legal entities

as a whole, all of which have led to the inclusion of the following operations in the sphere of activities related to (Dubosson-Torbay, Osterwalder, & Pigneur, 2002):

- the purchase and sale of products and services via the Internet;
- the transfer of funds through electronic networks; and
- the trading of information in electronic format.

Regarding distribution and trading, the emergence and further development of information technologies and electronic data communication networks have habitually generated new forms of social relations among manufacturers, intermediaries and consumers. To be more precise, e-commerce has effectively enabled companies to carry out internal operations more efficiently and flexibly, to successfully establish and effectively develop closer cooperation with suppliers and also to address and meet customers' demands, expectations and needs. Furthermore, irrespective of their geographical location, in selecting their suppliers, companies are generally given a free hand, in addition to being supported in entering the global market with their products and services (Chaffey, 2009).

The adoption of automation in various segments of an organisation, such as its customer service sector or its supply chain, has provided firms with a highly necessary competitive advantage. For instance, the creation of Semi-Automatic Business Research Environment (SABRE), a system of automatic booking for flights utilised by American Airlines in cooperation with IBM, not only facilitated making flights readily available, but also helped passengers to be aware of tariffs as well as the gradually growing number of flights (Hopper, 1990). Owing to the automation of the tariff calculation process during booking, the cost of services was consequently decreased. Moreover, the SABRE system exercised an integrated control of profitability, thus making it possible for American Airlines and subsequently for other airlines to maximise profits by means of handling prices with due account for seats availability (Smith, Leimkuhler, & Darrow, 1992). This example also indicates that electronic data communication systems are becoming a vital factor in determining the success of modern businesses, particularly within the context of the progressively significant growth of e-commerce across various industry sectors.

In addition, in the early 1960s, work on automation of inventory management helped immobilise substantial cash savings in the form of inventory and work in progress (Hopper, 1990). The simultaneous emergence of credit cards allowed for the automation of payments, whereas settlement transactions drove out expensive cheque technology and released time and human resources when making

settlements and payments (McCormack & Johnson, 2001). Such examples not only point to the increasingly crucial role played by both the use of investment in technology in running businesses effectively but also emphasise the need for businesses to efficiently address and meet the current demands of the market which were first caused by a series of technological advancements.

The evolution of technology continued to have a direct impact on the improvement of business transactions and, in the mid-1970s, the technology of electronic data interchange (EDI) and of electronic funds transfer (EFT) came into use. Also, in the mid-1980s, UN/ EDIFACT (Electronic Data Interchange For Administration, Commerce, and Transportation), an international standard, was adopted by ISO (ISO 9735). In turn, the use of the standard pointedly facilitated the conduct of business via the use of electronic instruments of communication. Having realised and acknowledged the advantages of the development of e-commerce via the Internet, in the 1990s, analysts of EDI developed the EDIINT standard (EDIFACT over the Internet). In the same decade, the US government transferred the functions of administrative management of the Internet vested in the federal agencies into private hands, which ensured a beneficial effect on the widening of the base of both providers and consumers of Internet-based services, which was soon followed by the connection of millions of computer operators across the world, thus successfully and rapidly enhancing global-scale businesses (Swatman & Swatman, 1992).

It is claimed that the development of electronic media of communication, storage, search, and processing has provided an excellent opportunity for businesses, and particularly for e-commerce companies, to generate a new format of economic relations which present several benefits and drawbacks (Kaynak, Tatoglu, & Kula, 2005). The following features are commonly designated as the main benefits of e-commerce:

1. E-commerce is oriented towards an individual consumer. As an information resource, the Internet makes it possible for consumers to gain further awareness of any product or service by way of participating in forums, due to receiving opinions and by taking into account reviews of other users of specific products or services (Daniel, Wilson, & Myers, 2002).
2. E-commerce typically enhances a reduction in operating assets, since working assets of e-commerce products can be entirely digital (Zhu, 2004).
3. E-commerce generally contributes to cost reductions (Grandon & Pearson, 2004).

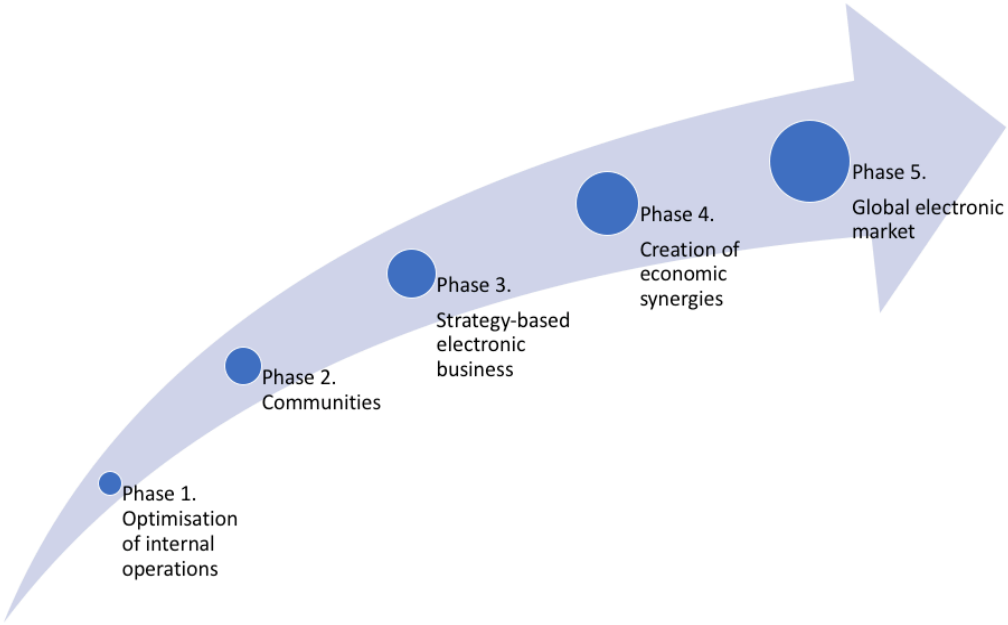
Granting access to the existing catalogue's products and services via electronic networks can, therefore, be viewed as the starting point for the development of e-commerce. To make the offered products and services more attractive, it is necessary to create an additional network services engine. In addition, the system offers businesses the ability to collect and analyse customer data, which further allows companies to improve the level of service delivery. Consequently, access to products and services via electronic networks offers great connivance to consumers, such as making purchases from geographically remote locations (Chaffey, 2009). This type of an organised service is administered according to a customer's or a business partner's convenience. Subsequently, the purpose of interaction is to present businesses with an opportunity to outsource part of the functions that have been initially performed by the company, by way of offering a reduction in transaction costs. The outsourcing of customer services in the form of e-commerce call centre services and multiple-channel support have aided in improving consumer satisfaction while reducing an organisation's operating expenses. For instance, an integrated accounting software managing a company's finances and partners' accounts, which include suppliers and distributions, can easily be viewed as an additional example of the outsourcing of functions initially performed by businesses. Outsourcing, therefore, supports the expansion of companies' capacity to use an increasing number of innovative products that otherwise may not have been able to develop on their own (Gunasekaran, Marri, McGaughey, & Nebhwani, 2002; Kotabe, Mol, & Murray, 2008). As a result, e-commerce offers efficiently and relatively easily implemented solutions towards the improvement of existing business processes, such as electronic mail, web-based data exchange and shared-use software. An aspect of the business that is still lacking in terms of electronic business integration is arguably quality control management in both production and services delivery. Similarly, solutions are also required for the improvement of knowledge management exercised through the involvement of expert panels and the utilisation of both knowledge banks and search systems.

2.1.1 Industry and network structures

Owing to the reduction of transaction costs, new instruments of communication offer new organisational opportunities for supporting all aspects of differentiation (in terms of products, business processes, and business ethics) by means of a reduction in costs and also in order for businesses to cope with the complexity, implementation of fast response and organisational learning. The overcoming of transaction-related barriers is what accounts for transactions of electronic business. It may be noted

that it is the Internet-based technology with its open and easy-to-use communication infrastructure that contributes to the development in the area of electronic business (A.T. Kearney, 2015; Amit & Zott, 2001; Barnes, 2002; Bayazit, 2014; Bryant & Levine, 2017; Chaffey, 2009; Chen & Dubinsky, 2003; Gunasekaran et al., 2002; Ives & Learmonth, 1984; Loconto & Busch, 2010; Schiller, 2000; Shin, 2008; Wellman, Boase, & Chen, 2002; Zahra & Covin, 1993; Zahra & Bogner, 2000). As illustrated below, therefore, five phases of evolution of electronic business can be identified (Figure 2.1)

Figure 2.1 Phases in the development of e-commerce



Source: compiled by author based on Ives and Learmonth (1984), Zahra and Covin (1993), Schiller (2000), Zahra and Bogner (2000), Amit and Zott (2001), Barnes (2002), Gunasekaran et al. (2002), Wellman et al. (2002), Chen and Dubinsky (2003), Shin (2008), Chaffey (2009), Loconto and Busch (2010), Bayazit (2014), Bryant and Levine (2017)

In the first phase "Optimisation of internal operation", corporations optimise the efficiency of their internal operations, enabling the standardisation and harmonisation of personnel management, internal systems, and processes, as well as communication with the outside world. Following this, a series of common lines of activities specific to this phase can be accordingly distinguished as follows (Bayazit, 2014; Gunasekaran et al., 2002; Ives & Learmonth, 1984):

1. The development of a behaviour strategy focused on electronic business. Management, marketing and administrative structures adapt to its support. Accordingly, flexible mechanisms for facilitating further changes are created.
2. Increasing capability to output and deliver products by means of alliances and partnerships, new technologies and improvement of processes and implementation standards, for example, through the use of JITM (Just-in-Time Manufacturing), ERP (Enterprise Resource Planning) and other similar systems.
3. The development of systems for business processes (both oriented towards the operating departments of the company and thereof going outside the scope) for the rationalisation of the company's internal environment, including the processes of documenting operations (back-office).
4. The development of integrated IT strategy and system architecture which provides for and supports these business processes.
5. The installation of infrastructure-related components of hardware and software (local network, wide-area network and intranet) required to link business units of the company with internal application programmes, so as to connect to each other.
6. The enhancement of application systems and business processes in order to meet specific internal and external requirements of an e-commerce.

In addition to the effective standardisation of and an increase in labour productivity of the companies personnel, these efforts result in visibly reducing costs, which, in turn, will further prepare and gear an e-commerce company towards new developmental phases (Bayazit, 2014; Gunasekaran et al., 2002; Ives & Learmonth, 1984).

In the second phase "Communities", the focus is shifted to the external environment, with particular attention being paid precisely to the expansion and growth of the company. In this case, web-based and Internet-based technologies are implemented in an attempt to enable having a direct outreach to consumers. By enhancing their intranets, companies subsequently create extranets for connection with suppliers, distributors and customers, and keep developing them. Furthermore, cooperating companies begin to integrate their intranets in specific places where their business processes overlap so that the free flow of information is ensured (e.g. concerning scheduled dates of output and shipment of products) and the freedom of business processes (e.g. procurements and payments) is enriched (Bryant & Levine, 2017; Shin, 2008; Wellman et al., 2002).

Hence, communities of interest appear and, by consolidating information, enable their members not only to standardise processes but also to share resources. As a rule, these communities are organised and operate under the leadership of the dominant participant (intermediary). As such, the free flow and consolidation of information help to solve an important problem in business, information asymmetry, thus allowing members of the community to make better and informed decisions. That being said, businesses and consumers both benefit from information asymmetry certain cases because they can charge higher prices, and will willingly pay lower prices, respectively, without the other party knowing any better. However, the environment in which transactions are concluded remains to be of a paper nature and is subsequently inherently weak; nevertheless, it stabilises the business environment, because of orienting it towards further changes (Bryant & Levine, 2017; Shin, 2008; Wellman et al., 2002).

As experience is gained and confidence among participants within communities is growing, more and more close relations are established. The transaction model then evolves into a collaborative model. This step facilitates a move towards the third phase - the phase of strategy-based electronic business. To enhance the creation of a community, participating companies will forecast in advance relevant infrastructural and technological elements required for supporting communication mechanisms, which will further enable them to enrich their communication with targeted existing and potential customers effectively (Chaffey, 2009; Zahra & Covin, 1993; Zahra & Bogner, 2000).

Corporations gradually step over the boundaries of the business to the consumer cycle with its main components, be those electronic catalogues, online purchases and reliable online payments, for instance. In the third phase “strategy-based electronic business”, attention is primarily paid to the improvement of the business-to-business (B2B) cycle. As a result, electronic companies which grow out of corporations are formed. Through the use of the Internet, intranet and extranet, these types of companies integrate all participants, irrespective whether these would be consumers, retailers, suppliers or manufacturers, into a single work process. Structures of this type may share a series of commonalities, including sources of information, workforce, business processes and market strategies. This feature enables participants to realise economies of scale, which, in turn, lead to a decrease in production costs. Furthermore, the total duration of the business cycle is shortened, accelerating the flow of products and services so that the costs of circulation inside the system are reduced. These benefits further lead to the creation of new value and the acceleration of the development of application programmes (up to their marketable maturity) (Chaffey, 2009; Zahra & Covin, 1993; Zahra & Bogner, 2000). The third phase is characterised by a large-scale and coordinated implementation of progressive electronic business strategies, such as

Quick Response (QR), Pay on Production (POP), Evaluated Receipt Settlement (ERS) or Vendor Managed Inventory (VMI). The unification of rules, coupled with the standardisation of instruments employed in running the business among participants (for example, content and process management, intercompany interfaces, the principal accounting and control functions, external reporting and business communications), serve as a prerequisite for it. Therefore, the unification of rules goes outside of the framework of single communities, such as Reddit and Shopify Facebook groups, thus requires a unified business technique, which is not related to the boundaries of communities and companies (Chaffey, 2009; Zahra & Covin, 1993; Zahra & Bogner, 2000).

As a result, emerges a number of centres that are focused on e-commerce communities that maintain communication among themselves and offer a wide range of commercial services towards a further development in the area of business-to-business. Such partnerships or joint ventures are established among the existing virtual companies, managers of communities, providers of hardware/software and services, industrial companies and administrative authorities. Hence, shared services offered by the centres of electronic business will have an increasingly crucial impact upon participants engaged in the first two phases, subsequently inducing them to move towards the creation of the environment of closer cooperation and to trade among agents of a community organisation. Consequently, internal business processes of a company are standardised and subsequently, a path is created towards the implementation of this type of application programmes, that are considered the best at building a genuinely open system. Before the establishment of the first and second phases, technology used to be at the forefront. The third phase has expanded the horizon by means of orientation towards strategic aspects of electronic business conducted by companies and communities. It is also evident that various companies cannot deliberately go further than the second phase but instead remain confined to the partial implementation of the third phase, thus deeming the benefit obtained in these phases of development to be sufficient for them (Chaffey, 2009; Zahra & Covin, 1993; Zahra & Bogner, 2000).

In the fourth phase “creation of economic synergies”, economic activities are treated as a whole, which is why economic synergies are created at this stage. Economic synergies typically occur when two firms combine and are then able to produce their product or products more efficiently, thereby reducing their costs. That should be taken as given. Also, centres of electronic business gradually merge into regional trade networks using common electronic services, tools, and systems. States, countries and geo-economic structures (e.g. the USA, Japan and Latin America) become more increasingly integrated. Owing to a series of relations established by communities of interest among themselves, as well as with

the outer world, vertical industrial groups, administrative systems, educational institutions and support agencies, these communities acquire a common infrastructure (Amit & Zott, 2001; Barnes, 2002; Chen & Dubinsky, 2003). Inter-company business engineering, rules of conduct in an electronic environment, shared software applications and procedural interface have led to the implementation of the best industrial practice and unified rules of conduct of business into relations among community participants. In turn, systems of joint budget management, audit and information management are also put in place and effect. Additionally, legislation-related activity – such as the application of laws and regulations – is transferred into and undertaken in electronic format (Amit & Zott, 2001; Barnes, 2002; Chen & Dubinsky, 2003).

The fourth phase is not just a functional expansion of the third phase. At this stage, it is important to consider the fact that there are various geo-economic structures enforced across the world, which, more recently, and even within the boundaries of the same geographical location, have little in common. For instance, because the USA applies different rules, different strategies of electronic business, different business practices and different business techniques when compared to the Pacific Region, it definitely distinguishes itself from otherwise economically similar contexts in Europe, the Middle East or Asia. That is why each region seems to develop its network of electronic trade and, by doing so, is likely to facilitate business specific for its structure (Amit & Zott, 2001; Barnes, 2002; Chen & Dubinsky, 2003).

The issue posed by the imperative of achieving internal integration, be it within a country, or an organisation, constitutes the most significant problem for each geo-economic structure in the fourth phase. It is complicated to achieve internal integration precisely in regions such as the USA and Europe where distinct single states and countries have different business practice, are governed differently and are not regulated by a central supervisory body that actively enforces a series of particular standards. Moreover, not all the companies aim to or are able to cooperate at this level (except, maybe, in a number of individual cases). For all these reasons, a complete integration of business practices and operations within one region is unlikely. However, in the majority of cases, 20% of the most significant players are very likely to be integrated, with that figure approaching 80% of business activity once a critical mass is achieved. However, even in such a case, geo-economic structures will conduct business with contractors, mainly in the widely utilised traditional way – similarly to a company that situates itself in-between the first and the second phases of development (Amit & Zott, 2001; Barnes, 2002; Chen & Dubinsky, 2003).

Also, in the fourth phase, regional trade networks begin to develop inside each structure. As is the case with the third phase, these networks are characterised by alliances among the providers of the best of its software type, service providers and industrial associations. As necessity arises, governments lend support. As for the most optimal models, the state is likely to perform the functions of the supporting agency and business partner, rather than those of a supervisor or controlling agency (Amit & Zott, 2001; Barnes, 2002; Chen & Dubinsky, 2003).

In the fifth phase "global electronic market", geo-economic structures unite into mega-communities or trading blocs and then progressively integrate with all other regional structures with which they establish and maintain business relations. Thus, different regional trade networks grow into continually expanding to a global electronic market. Trans-border movement of products, services and single persons, international social services, custom duties and taxes on added value, multinational trade treaties, trade restrictions and agreements with respect to legislation and regulatory activity and also selling and purchasing on the global market, in addition to taxation – all these issues are solved in the fifth phase, for which a series of common trade policies, technological infrastructures, and information systems are required (A.T. Kearney, 2015; Loconto & Busch, 2010; Schiller, 2000).

Taking into account all the stages aforementioned, local authorities and transnational organisations, such as the United Nations Organization (in terms of trade) and the European Union, suggested that they will support this global network and direct its development. The most optimal will be the model conveying global trade as feasible under the conditions of a minimum of control and supervision on the part of the state and high-powered organisations. The majority of transactions are converted in electronic format, thus importantly reducing the time and financial component of the transaction cost structure, on the one hand, and establishing new rules of conduct of economic entities on the Internet market, on the other hand (Cheong et al., 2006). As a result of this type of a transformation, the competition within the Internet market has been consistently increasing. From this perspective, research on the development of approaches to the marketing activity of e-commerce companies, focusing on the issue of effective product policy within the Internet market environment, has increasingly become more relevant. Unlike traditional companies, which conduct their business operation on a face-to-face basis, in the case of e-commerce companies, most business transactions are conducted virtually via the Internet. Given that institutional theory advocates that business organisations in the virtual space (Internet) operate within specific institutional environmental structures (Mueller, 2010), firstly, it is necessary to look differently at the institutional structure of the Internet market; secondly, it is crucial to both identify and examine

institutions which impact upon their marketing activity in general; and, thirdly, the overall implementation of product policy of e-commerce companies would need to be analysed.

As the following section explores, there is only a small volume of theories relating to the characteristics of contemporary society and the core of economic relations as they relate to the interaction between global and local factors in the development of technology.

2.2 The theory of information society

Despite the fact that recent years have been characterised by both significant advances in technology and rapid economic growth, there are only a few theories related to the nature of modern society and the essence of economic relationships in terms of the interplay between local and global factors in technological development (Ceulemans & Fauconnier, 2015; Sparks, 2007). Most contemporary scholars have pointed out the increasingly larger role which information plays not only in the contemporary social environment, but also in the contemporary economy. As a result, theories of post-industrial society, knowledge society, information revolution, and network society have been advanced largely in an attempt to understand the role of information and technology in contemporary society (Arvidsson & Colleoni, 2012; Webster, 2006). Contemporary society is a type of information and network society. All of these theories are based on the idea that information has become primarily a market product. The benefit of this underlying trend lies in the reduction of information asymmetry, as information has increasingly become much more accessible, due to both technological development and the use of the Internet globally. However, in some cases the scarcity of information has made certain types of information, particularly as related to competitive corporate data, extremely expensive, which is why it is necessary that companies invest in information technology and consistently remain competitive within the global market. More specifically, several scholars in the information field (e.g. Bennett, 2003; Sparks, 2007; Vasterman, Yzermans, & Dirkzwager, 2005) have claimed that mass media can be redefined as a method via which information is sold. However, this perspective might not be precisely accurate or still hold validity, since it differs from the definition of mass media as considered and reviewed in traditional markets research studies (e.g. Ceulemans & Fauconnier, 2015; Garnham, 1990). Conversely, the present research study proposes that it is necessary to identify the main common specific

features of contemporary economic relationships by using systematisation, in addition to employing an analysis of various conceptualisations of economic and social development.

The importance of information in every-day life is evident in information society. Defined by Beniger (1986) as a society where information and its different users play a crucial and dynamic role in economic, political and cultural activities, one of the major objectives of information society is to gain competitive advantage worldwide by utilising information technologies in business as well as in innovation processes. Consequently, the concept of information society, constitutes one of the models which illustrates the fact that humanity has entered a new social and economic era (Beniger, 1986). Economic, technological, occupational and cultural aspects of social development or a combination of all of them can easily be viewed as the background for the development of information society (Beniger, 1986).

Furthermore, the theory of information society is closely related to other theoretical perspectives, namely, theories of post-industrial society (e.g. Bell, 1976); post-fordism (e.g. Hall, Morley, & Chen, 2005; Marazzi & Mecchia, 2011); post-modernist society (e.g. Lyotard, 2005; Rotaru, Nitulescu, & Rudolf, 2010); knowledge society (e.g. Darwin, Adler, & Hutchins, 1882; Drucker, 2007; Husen, 1979); information revolution (e.g. A. Porter, 1998; Bernal, 1986); liquid modernity (e.g. Bauman, 2013; Bauman & Donskis, 2013) and network society (e.g. Castells, 2010; van Dijk, 2012), as they all emphasise that information remains vital to modern society because it has become affordable to obtain (Wellman et al., 2002). One of the main similarities shared by all these theories is that they are based mainly on a consideration of developed economies, and of North American and Western European economies. They also analyse society as a whole, and therefore do not focus on its impact upon individuals. Consequently, it can be noted that numerous scholars (e.g. Bauman, 2001; Rotaru et al., 2010; van Dijk, 2012) have acknowledged a range of significant transformations of information society (particularly as related to social transformation where information society transforms itself in totality) which began in the 1970s and have since gained pace to date (Wellman et al., 2002). Evidently, information plays an important role in society, as a number of theories, such as liquid modernity and knowledge society, in particular, indicate that information constitutes an essential aspect of economic growth. Having these considerations in view, it is claimed that a better understanding of the relationship between information, socio-economic factors, and economic development is required. As such, from a microeconomic perspective, information above all has become a highly-demanded product not only in terms of production, but also as related to the products and service markets. However, on a macroeconomic level, little is known about the impact of information upon society or economy (Bauman,

2001; Rotaru et al., 2010; van Dijk, 2012; Wellman et al., 2002). The next section discusses the beginnings of information society and its relationship with contemporary society.

2.2.1 The Beginnings of information society

An important academic breakthrough was made when the relationship between contemporary society and information society was established. A single precise definition of the concept of information society does not exist. The classical economist Machlup (1962), one of the first researchers who conceptualised the notion of information society, theorized that information society may be referred to as a form of a community involved in the manipulation, distribution, and the creation of information as a cultural and economic activity. Drawing upon this understanding, contemporary information society cannot be conceptualised as necessarily an agrarian or an industrial society, since both telecommunications and computers, but not heavy machinery, such as ploughs and lathes, are used as trade tools. Furthermore, Machlup (1962) also introduced the idea of knowledge industry, and subsequently distinguished among various understandings of knowledge according to five industry sectors: education, research and development, mass media, information technologies and information services. As pointed out by Machlup (1962), in 1959 the United States transitioned from an economy based on material values to a knowledge-based economy, with approximately 29% of its GNP produced by knowledge-based industries. This is why both Machlup (1962) and Drucker (2007) share this theoretical approach to information society and economic transition. In addition, both scholars acknowledged that the concept of knowledge economy, where factors of production are reliant on the abundance of natural resources, is influenced by economic factors (Drucker, 2007).

The Tunis Agenda for the information society is a contract in order to monitor the financial structure of the internet. It was implemented on the 18th of November 2005, which proves that the World Summit has implemented the stance on Information Society with the theme of monitoring multi-stakeholder structure of the virtual network and the Internet (Mowlana & Wilson, 1990). It provides the true example of distribution and manipulation of data as an economic and cultural activity (Machlup, 1962), which would be accepted by various authorities and added with technology, according to progress. This contract proves that modern era economies are an example of working within knowledge-based economies and providing sustenance for an information society, which ultimately shows the intense relationship between economy, society and information.

In order to further explore and specify what information society is determined by, Porat and Rubin (1977) identified and discussed the primary sector in information society as a system of both information products and services which are directly associated with the production, distribution and processing of information, whereas the secondary sector was conceptualised as a compilation of information services for internal consumption by public organisations and non-information firms. In assessing an information economy, Porat and Rubin (1977) used the total volume of product, which was added to the GNP of the two sectors and further recycled as an indicator of the development of an information-based economy. By employing such a theoretical approach, information society has been defined as a social context in which more than a half of the total GNP is produced in information sectors (Porat & Rubin, 1977). Unmistakeably, as pointed out in the majority of research studies on the topic (e.g. Boisot, 1998; Eliasson, Fölster, Lindberg, Pousette, & Taymaz, 1990; Sisfeld, 2016), information technology companies are among the largest firms in the United States, for instance. In less developed economies, such as Rwanda, the information economy has brought the market greater prosperity in a very short amount of time, due to the country's geographic location as in between eastern and western hemispheres. Thus, it is claimed that the growth of information-based economies is typically registered as a result of a significant increase in the global demand for information technologies (Porat & Rubin, 1977).

The growth in the demand for information globally has also led to an increase in the number of employees who work towards increasing information supply. According to Bell (1976), the number of employees who render services and produce information may also be interpreted and used as a valuable indicator of the informational character of society, since what counts in a knowledge-based economy is not raw muscle power or energy, but information. Therefore, postindustrial society may then be defined as one in which the majority of companies do not produce tangible products. Hence, information society operates as a society where the majority (more than half) of employees work in an information-based economy (Porat & Rubin, 1977). In other words, these types of theoretical models start from the assumption that the majority of employees work in information-technology jobs and thus need "to deal with information, signals, symbols and images rather than with energy and matter" (Fuchs, 2010, p. 80). Furthermore, the declining role of employees in manufacturing products is explored by Touraine (1988), who sums up the idea of post-industrial society by placing an emphasis on the production of *intangible products rather than on material products*:

> The passage to postindustrial society takes place when investment results in the production of symbolic goods that modify values, needs, representations, far more than in the production of material goods or even of 'services.' Industrial society had transformed the means of production: postindustrial society changes the ends of production, that is, culture. The decisive point here is that in postindustrial society all of the economic system is the object of intervention of society upon itself. That is why we can call it the programmed society, because this phrase captures its capacity to create models of management, production, organization, distribution, and consumption, so that such a society appears, at all its functional levels, as the product of an action exercised by the society itself, and not as the outcome of natural laws or cultural specificities. (1988, p. 104)

Unlike Bell (1976),who believed in the potential of production and advocated for the generation of information as a basis of efficient functioning of a society, Touraine (1971) claimed that a self-developing programmed society should reinvest even more substantial parts of production and, therefore, produce and transform itself into a viable production economy.

2.2.2 Characteristics of an Information Society

Overall, postindustrial society has been converted into a scientific civilisation based on education, services, and creative activities. Due to how information technologies have progressed thanks to the increasing importance of computer technologies, the transformation may be viewed as a result of changes in scientific research and technology, which have become immediate forces of production subsequently increasing the demand for material products (Richta, 1977). Within the context of development and transformation, knowledge is the central resource of information society (Dyson, 1996). This is why, as Stehr has claimed, "[c]ontemporary society may be described as a knowledge society based on the extensive penetration of all its spheres of life and institutions by scientific and technological knowledge" (2002, p. 18). According to Stehr (2002), within the economy of knowledge society, as driven not by material inputs but rather by symbolic or knowledge-based inputs, knowledge has poignantly become the principal force of production and has also been rapidly transformed into a product. Moreover, the increase in the production of information in the modern post-industrial society has made knowledge much more readily available to the general public, thus imperatively increasing the use of information

technology. These changes are generally referred to as the post-modernist society (Lyotard, 2005), a notion based on a consideration of the fact that modern society is essentially driven by information from both economic and social perspectives, which has subsequently resulted in a decrease in the demand for material production. A main characteristic of an information society is therefore the logic inherent within its underlying networked structure. This structure is central to the idea of the network society. In examining the trend historically, Castells (2010) posits that the central characteristics within the age of information are beginning to be centred around networks that raise information access and are highly beneficial in challenging the contemporary monopoly that powerful organisations have on data.

Networks make up the social morphology inherent in modern societies, and the profusion of the logic within these networks substantially modifies the outcomes and operations surrounding the experience, production, culture, and power processes (Castells, 2010). Networks are a modern society's central nervous system. Consequently, a networked social order can be delineated in a configuration consisting of media and social networks, which then enables its primary organisational mode to be a group, an individual, or an organisation (van Dijk, 2012).

As a network society is a central feature of the information technology paradigm, besides features such as information, pervasiveness, flexibility, and convergence (Castells & Cardoso, 2006), it is worth noting that a network society may be considered to be a consequence of informationalism or a new technological paradigm in which information is the primary product (Castells, 2010). Subsequently, the concept of network society has been frequently linked to capitalist transformation (Castells, 2010) or typically viewed as a result of the widening and strengthening of networks in both nature and society (van Dijk, 2012). Alternatively, Barney (2010) uses the term of network society in order to characterise societies which primarily exhibit two fundamental characteristics. Firstly, in network societies, it is the presence of highly developed digital technologies, network communications and information management and technologies that form the fundamental infrastructure of political, social and economic practices. These societies are then mainly shaped by the pervasive reproduction and institutionalisation of information society as the basic form of human organisation and the establishment and development of relationships between social, political and economic configurations and associations (Barney, 2010). The key ideas of the theory of information society are summarised in Table 2.2.

Table 2.2 Main Ideas of Theory of Information society

Authors	Key Concept and Main Ideas
Machlup (1962)	There is a knowledge industry in information society. This industry consists of five sectors: education, research and development, mass media, information technologies and information services.
Touraine (1971)	The transition to postindustrial society takes place when investment results in the production of symbolic products which modify values, needs, representations, far more than in the production of material products. The concept of "programmed society" thus differs in that the products it produces are of higher value than that of an industrial society.
Bell (1976) Fuchs (2010)	Postindustrial society is a society in which the majority of those employed are not involved in the production of tangible products.
Richta (1977)	Society transforms into a scientific civilisation which is based on services, education and creative activities, mainly because science and technology have become immediate forces of production.
Porat (1977)	Information society is a society where more than half of the total GNP is produced in information sectors, and more than half of the employed population is engaged in an information-based economy.
Beniger (1986)	Information society is a society in which the creation, dissemination, use, integration; manipulation, and control of information constitute crucial economic, political and cultural activities.
Dawson and Foster (1996)	The combination of marketing and new information technology enables certain firms to obtain higher marginal profit and more significant market shares and thereby promotes greater concentration and centralisation of capital.
Schiller (2000)	Networks are directly generalising the social and cultural range of the capitalist economy as never before.

Table 2.2 (Continued)

Authors	Key Concept and Main Ideas
Stehr (2002), Dyson (1996)	Modern-day society can be portrayed along the lines of a knowledge society, according to the widespread penetration of its institutions and ways of life by technological and scientific knowledge.
Fitzpatrick (2002)	The focus on the computer as a guiding technology transforms the productive forces of capitalism and enables the globalisation of economy.
Hardt and Negri (2003)	Contemporary society is an empire characterised by a singular global logic of capitalist domination which is based on immaterial labour.
Lyotard (2005)	Knowledge shall be transformed into and viewed as a product. Postindustrial society makes knowledge accessible to the laymen, and thereby knowledge and information technologies would diffuse into society.
Castells and Cardoso (2006)	Network society is the result of informationalism, a new technological paradigm. Network logic therefore represents a central feature of the information technology paradigm, in addition to features such as information, pervasiveness, flexibility and convergence.
Webster (2006)	The theory of information society highlights several new qualities of society, which include globalisation and informatisation, but it cannot be demonstrated that these are still attributes of a capitalist society.
Barney (2010)	Network society is characterised by highly developed digital technologies, network communications, and information management as well as by self-reproduction and self-institutionalisation.
Fuchs (2010)	Digital networks represent the technological foundation which allows global network capitalism to exist, namely, the accumulation and regulation of rules of conduct.
Castells (2010)	Information-based capitalism is a new technological paradigm which is characterised by the generation, processing, and transmission of information, which, in turn, is becoming the fundamental source of productivity and power.

Table 2.2 (Continued)

Authors	Key Concept and Main Ideas
van Dijk (2012)	Network society is a social structure with an infrastructure which consists of social and media networks and thus empowering its prime mode of the organisation at all levels (individual, group or organisational and societal).

Source: compiled by the author

As illustrated in the Table 2.2, the concept of information society has been thoroughly reviewed, according to different understandings of the relationship between information and how it contributes to the development of industry sectors and of society in general. The present research study refers to one of the main characteristics of contemporary society; therefore the information society shall be understood as an economic and social system in which products of immaterial labour (e.g. information, knowledge, information services) are the primary objective of economic activity, while information technologies may be viewed as the main driving force, and the network remains the main form of institutional organisation. This concept functions as a scientific abstraction highlighting the peculiar features of contemporary society but which by no means denies the development of other economic and social phenomena (Burrough, 1986).

In addition to the main features of information society, the following principles might be considered:

- information becomes a highly-demanded product on the market as well as the primary factor of production (Beniger, 1986);
- the total informatisation of economic and social relations (Castells, 1997);
- the increase of the proportion of employees engaged in the sector of production, processing, and communication of information (Garrett, 2006);
- the development of the global market network information space is characterised by the reduction of geographical barriers, while the improvement of information becomes blurred between economic agents (Jensen, 2001).

The issue of information society has also received wide critical attention for its contribution to the evolution of industries from healthcare to textiles to transportation. It has been argued that, "[i]f there is just more information, then it is hard to understand why anyone should suggest that we have before us something radically new" (Webster, 2006, p. 22). Greater access to information in general does not

cause the innovation commonly attributed with the information age. However, this access may be the catalyst necessary to facilitate the widespread and rapid innovation that can be seen throughout the world across industries, using this informational access as powerful leverage (e.g. Drucker, 2007; Hall et al., 2005; Marazzi & Mecchia, 2011; Webster, 2006).

According to Webster (2006), ambiguous information is the evidence of discontinuity, more specifically, of the recognition that contemporary society has significantly changed over the past one or two centuries. Such assumptions should be solely ideological in character because they should contribute to an understanding that little can be practically done about change, which is why, alternatively, organisations would have to adapt to existing political realities (Webster, 2006). The assumptions made by Webster (2006) firstly speak to the fact that contemporary society is still a capitalist society, yet oriented towards the imperative to accumulate economic, political, and cultural capital. The theory of information society, therefore, highlights a series of new trends in and characteristics of contemporary society, including globalisation and informatisation, even if it cannot be claimed that these are exclusively the attributes of capitalist society (Webster, 2006). In the following section, the views of informatisation and globalisation are expanded upon while further describing the competing views of information society.

2.2.3 Additional views on the information society

A number of science-based concepts have been suggested to the effect that the recent era is one of the milestones of capitalism, as briefly discussed below:

1. *Transnational network capitalism or transnational informational capitalism* (Fuchs, 2010). According to this theoretical approach, computer networks operate as the technological foundation which allows global network capitalism to exist. The need to discover and utilise new strategies of executing corporate and political domination has resulted in the restructuring of capitalism, a tendency which is characterised by the emergence of transnational, network spaces in economic, political and cultural environments. Therefore, Fuchs concludes that "[t]his segmentation is an expression of the overall competitive character of contemporary society" (Fuchs, 2010, p. 2). According to his line of argument, this is one of the reasons why new capitalistic relations employ cyberspace as a tool of global coordination and communication.

2. *Digital capitalism* (Schiller, 2000). In this view, networks are directly generalising the social and cultural range of the capitalist economy as never before. An explosion in consumerism on an international scale is attributed to the convenience of networks and cyber space. More recently, consumers have been able to purchase products more quickly and conveniently and are also embracing this opportunity. Besides, it has been argued that the lack of stringent controls has allowed cyberspace to gain democratic attributes. These attributes can be partially assigned to the introduction of economies of scale, since opening up markets to worldwide access will necessarily drive prices down and offerings to those of highest common interest (Schiller, 2000).
3. *Virtual capitalism* (Dawson & Foster, 1996). The combination of marketing and new information technology enables certain firms not only to obtain higher marginal profit, but also to significantly increase their market shares. This is a perspective that promotes a greater concentration and centralisation of capital. At the same time, "more and more people are going to operate outside corporate structures and hierarchies in the nooks and crannies that the Information Revolution creates" (Dawson & Foster, 1996, p. 40). The personal element of greater information and technological access means that corporations' function more profitably with fewer people involved. Those people no longer chained to their employment in large corporations are liberated to pursue all the opportunities at their disposal (Dawson & Foster, 1996).
4. *High-tech capitalism or information-based capitalism* (Fitzpatrick, 2002). This type of capitalism focuses on the computer as a guiding technology which transforms the productive forces of capitalism and enables the globalisation of economy. The application of traditional theory to a review of Information and Communication Technologies (ICTs) sums the concept of *cyber criticalism*. As a model, "cyber criticalism is critical theory updated for the information age ...it identifies flows of power and the intensification of those flows around the dominant nodes of the informational net" (Fitzpatrick, 2002, p. 357). Information does not flow evenly, even as it is globalised. Topics will trend around certain groups and geographical areas, according to political changes and informational access points (Fitzpatrick, 2002).

Nevertheless, the majority of scholars have tended to prefer using the term of information-based capitalism. For instance, Castells (2010) views information-based capitalism as a new technological paradigm which is mainly characterised by the generation, processing, and transmission of information and which is becoming the fundamental source of both productivity and power. Thus, the most decisive historical factors, namely, accelerating, channelling and shaping the information and technology

paradigm, coupled with inducing its associated social forms, have been identified with the process of capitalist restructuring undertaken, particularly since the 1980s. Consequently, the contemporary system of techno-economics can be sufficiently qualified within information capitalism (Castells, 2010). In his scholarly contribution to theories of information society, Castells (2010) has also advanced the idea that the increasingly organised network is the dominant function and process in contemporary society and subsequently constitutes the new social morphology of society. Additionally, Castells (2010) posits that capitalist production shaped the increase in the recent mode of development, and more specifically, by the contemporary capitalist society, which entails that technology does not constitute the sole driving force of society.

Hardt and Negri's (2003) ideas also need to be taken into account. These two researchers' study argues that contemporary society is an empire shaped on the basis of immaterial labour by the logic of capitalist dominion. In this neo-Marxist view of the contemporary process of the development of capitalism, immaterial labour is specifically conceptualised as labour which produces immaterial products, such as communication, relationships, knowledge, information or emotional response as well as services, cultural products and knowledge. Accordingly, two forms of such labour can be distinguished: intellectual labour – which produces ideas, texts, symbols, linguistic figures, codes and images, for instance; and affective labour – which produces and manipulates emotions, such as feeling of ease, satisfaction, well-being, excitement, passion, for example (Hardt & Negri, 2003).

Therefore, it is proposed that the concept of knowledge-based economy is directly associated with the notion of information society. Because information economy is an economy in which greater attention is paid to information-related activity and information industry (Allen, 1990), this notion pertains to the concept of information society and covers only one side of life, that is, the economic side. Thus, information economy is conceptualised as a stage or a phase of economy, which follows the previous stages of hunting, agriculture, and manufacturing, which are diminishing in their value to contemporary society (Castells, 2010).

The notions of the knowledge economy and digital economy also share a similar meaning. As discussed and theorised by Tapscott (1996), for instance, digital economy is an economy based on electronic and digital computing technologies, such as computer networks and Internet-based technologies. Moreover, in such an environment, economic agents are engaged in e-commerce, while products and services function as objects of exchange. The idea of a knowledge-based economy dates

back to the 1990s, as also acknowledged by Negroponte (1995) who discussed the switch from the study of atomic motion to the study of the movement of pieces of information as well as future economic advantages (virtuality of products and global communications). Synonymic names of the electronic economy, more recently, include: the network economy, the Internet economy, the new economy or the web economy. However, the electronic economy is an economy whose functions primarily depend on digital computing, while the web economy is essentially an economy that establishes transactions and communicates via the Internet.

The network economy tends to be generally understood as the emerging economic theory within information society (Jackson, 2008). The concept stems from the assumption that products and services are created via a network of communication between social and economic institutions on both transnational and global scales. The main difference between the network economy and the industrial-era economy is that, in the industrial era, ownership of products directly depends on the manufacturing of such a product by a single enterprise. Thus, the concept of network economy explores business-models of contemporary society in which rights of ownership belong to a network of economic agents (Jackson, 2008).

A network economy may be viewed in different ways, including within the context of the transition from an industrial economy, the establishment of digital and information infrastructure, globalisation, and changes in the definition of intellectual rights. From a transitional point of view, Nüttgens, Scheer, Malone and Laubacher (1999) note that the information revolution has changed the nature of modern business activity. Centralised decision-making and expensive bureaucracies lose their significance in business, since information can be communicated almost instantly and inexpensively on a global scale (Nüttgens et al., 1999). As pointed out in a different study (Brand, 1999), this not only leads to commerce being supported by both digital and network revolutions, but also to its role in exploiting and absorbing these shocks.

According to Brand (1999), network economy gains access to global markets through a digital platform, but there is still a need for well-defined intellectual rights. In fact, the network economy changes the traditional view on the issues of protection of intellectual property and rights. Shapiro and Varian (1998, p. 21) emphasise that "information delivered over a network in digital form exhibits the first-copy problem in an extreme way: once the first copy of the information has been produced, additional copies cost essentially nothing". Alternatively, Rifkin (2001) believes that traditional markets will make way for

networks and also claims that ownership will be replaced by access rights, as a result of which the use of access rights will increase participation in the economy leading to economic growth and progress.

A virtual economy, or sometimes synthetic economy, is an emergent economy existing in a virtual world, typically within the context of Internet entertainments, such as multiplayer virtual reality games (Shin, 2008). The knowledge economy uses technologies related to obtaining and processing knowledge (i.e. knowledge engineering and knowledge management), in order to generate economic benefits and to create jobs in the knowledge industry. Accordingly, Drucker (2007) popularised this concept by attributing the origin of the term to Machlup (1962) through the concept of scientific management, which, more recently, has been adopted by Darmody (2007), among others. Many scholars suggest that, due to development of information society, global economy is transitioning to a knowledge economy. This line of thought is also followed by or shared in recent studies, including in the findings of Smith (2002), Blomström, Kokko and Sjöholm (2002), Powell and Snellman (2004), as well as Antràs, Garicano and Rossi-Hansberg (2006), and Rothboeck (2009), to name a few. As such, these studies acknowledge the fact that recent technological advances have increased productivity in the economy.

The increasing prospect of an economy primarily dealing with information has led to the development of the concept of knowledge-based economy. By adding the structural aspects of technological trajectories and regimes from a system perspective, it was Cooke and Leydesdorff (2006) who initially introduced the concept of knowledge-based economy (as distinguished from knowledge economy). The system perspective leads, for example, to discussions about intellectual property and rights as another form of capital that are also subject to a number of changes.

Nowadays, the economy is extremely dynamic, and comparative advantage is less significant than competitive advantage because the former rests on making more productive use of inputs, and thus requires continual innovation (A. Porter, 1998). Based on these types of economic development and business acumen, particularly given a series of changes in technology-oriented contemporary society, Porter (A., 1998) has also predicted the demand for careers such as information scientists, programmers, chemists, biologists, mathematicians as well as for other scholars and researchers who are generators of knowledge. For this reason, he argues that well-situated clusters of information remain vital to global economies. Porter (M., 1998) concluded that “the enduring competitive advantages in a global economy are often heavily local, arising from concentrations of highly specialised skills and knowledge [...]” (M. Porter, 1998, p. 16). Consequently, local competitiveness within the global market

is a phenomenon encountered around the world, but a network economy might represent the solution to this problem.

Alternatively, knowledge economy proves itself in cluster structures which are located in different places across the world, among which the most well-known include Silicon Valley in California; the aerospace cluster in Munich, Germany; the biotechnology cluster in India; the electronics and digital media cluster in Seoul, South Korea; and the energy technology cluster in Brazil (Ash, Coder, Dupont, & Rosenbloom, 2009). Several researchers (e.g. Rooney, Hearn, & Kastelle, 2012) have further theorised that knowledge economy is the predecessor of network economy and thus shares localised knowledge available to many economic agents, in an attempt to gain more substantial benefit, which subsequently entails both an economy of scale and greater openness of the global economy.

Evidently, for the above, different approaches to the definition of the contemporary economic system are described in more recently-published literature. The essential concepts are presented in Table 2.3. It should be noted that the last four theories appear to be semantically linked as parts of the first theory, namely, the theory of information economy. That is why the present research study adheres to a number of scientific abstractions, such as information economy. Consequently, information economy is considered as an economy which is inherent to information society and in which information or information products, knowledge and services assert themselves as the primary objects of economic relations while economic exchange takes place through global computer networks (Chen, 1995). Based on the assumption that this definition is an abstraction, in real life, other materials and immaterial forms of activity are noted as continuing to develop, as pointed out in Table 2.3 below.

Table 2.3 Main Approaches to Definitions of Contemporary Economy

Type of Economy	Exponents	Contents
Information economy	Castells (2010)	The economic theory of information society pays greater attention to the information-related activity and to the information industry.

Table 2.3 (Continued)

Type of Economy	Exponents	Contents
Digital economy	Negroponte (1995)	An economy which is primarily based on electronic or digital computing technologies (computer networks, Internet-based technologies).
Network economy	Tapscott (1996) Malone and Laubacher (1998) Brand (1999) Kelly (1999) Boyett (2001)	An economy which explores business models of contemporary society in which rights of ownership typically belong to a network of economic agents.
Virtual (synthetic) economy	Shin (2008)	An economy that exists in a virtual world and in which virtual products are exchanged.
Knowledge economy	Machlup (1962) Porter (A., 1998) Smith (2002) Drucker (2003)	An economy mainly related to both obtaining and processing knowledge (knowledge engineering and knowledge management) in order to generate economic benefits and also to create jobs in the knowledge industry.

Source: compiled by the author

In the table above, the economy of information is deemed inherent within a society of information, along with the transaction of information, information services, products, and knowledge, which become the primary units of exchange via computer networks. The following section further expands the dimensions of the information society.

2.2.4 Dimensions of the Internet Space

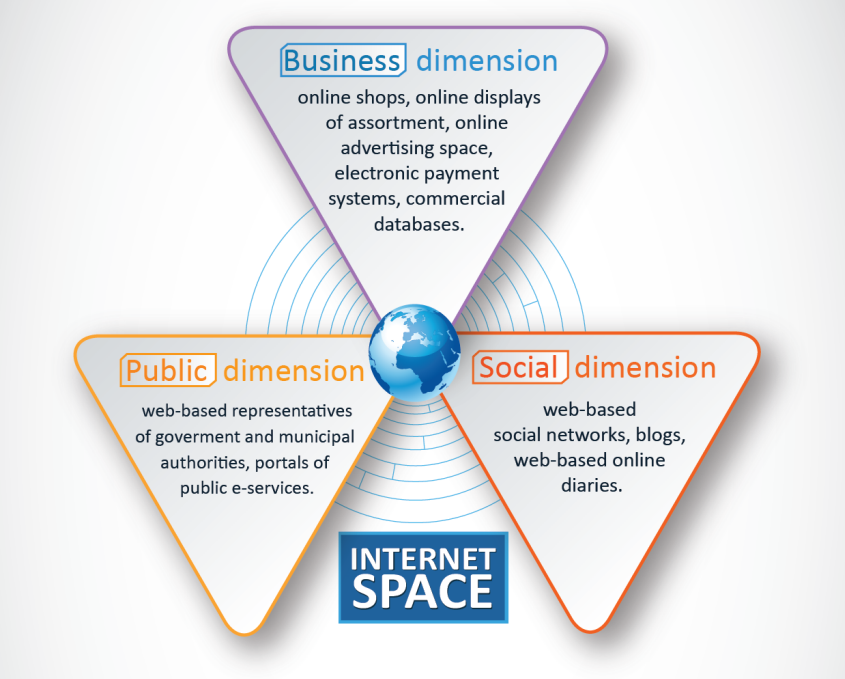
The Internet, coupled with the network that it creates and enhances globally, thus constitutes the primary tool utilised towards the development of an Internet space. Essentially, it functions as a platform for cooperation amongst economic agents operating within the information economy. Before proceeding to a further analysis of information economy, it is necessary to define a few dimensions of the Internet space. According to protocols or sectors, the global network or the Internet space may be divided into three main dimensions, as illustrated in Figure 2.2: business, public and social dimensions.

Public dimension. This dimension is intended to include sites which are online representations of government institutions and departments, government and municipal authorities, among other portals of public e-services (Castells & Cardoso, 2006). The websites allow for convenient public services offered to the general public. Through this platform, the government also keeps track of internal activities and communications.

Social dimension. This virtual area may include web-based social networks, online diaries and blogs. Factors affecting the alignment of a social dimension include successful IT implementation, sharing of domain knowledge, connections within the process of planning, and communication. Of these factors, only sharing of domain knowledge between involved parties was found to be connected to long-term network success (Reich & Benbasat, 2000).

Business dimension. To date, it must be noted that this dimension has acquired a significant share of the Internet platform. It may include online (web-based representations of traditional companies which are not connected to electronic payment systems): shops, auctions, catalogues, displays of assortment, virtual advertising space, and commercial databases (Bayazit, 2014).

Figure 2.2 Dimensions of the Internet Space



Source: adapted from Bayazit (2014), Castells and Cardoso (2006), Reich and Benbasat (2000)

The three dimensions described in the above may overlap and form intersectional structures. As such, e-trading platforms for government procurement may serve as an example of this type of a structure. Furthermore, these platforms may be employed as a tool of cooperation between government institutions and market agents (Grönroos, Heinonen, Isoniemi, & Lindholm, 2000). Other examples are contemporary social networks which, given their global reach and the low costs involved, offer an opportunity for businesses to place advertising. A benefit of e-trading platforms is that they expose the products and services available on the market to a greater worldwide audience. However, the drawback of this type of platform lies in the fact that particular differences in locations give a specific firm a competitive advantage over its rivals, as the firm may be able to produce products at a cheaper price, due to a variety of factors such as lower wage costs. The business dimension, in turn, may be divided into two major components: the seller-buyer market (i.e. B2C business model) and seller-seller market (i.e. B2B business model). In this research study, for reasons of limiting scope, an emphasis is placed only on end-seller consumer virtual market or online consumer market.

Just as the internet disrupted many industries and facets of business, the consumer marketplace online has been altered, but continues to be essentially unchanged from other developed marketplaces.

As in times past, the innermost point of a marketplace is reserved for the public exchange of products and services. The location of these markets used to be within a town or city square or central location. Nowadays, these transactions have moved to a virtual centralised location. However, the actions and results are essentially the same in that products and services are exchanged for currency. Within the context of the online consumer market, according to Mosselmans (2007), the definition of the concept of the market place should be understood within the lines of its original conceptualisation by an 19th-century English economist, Jevons (1888), namely, as:

> [...] much what commercial men use it to express. Originally a market was a public place in a town where provisions and other objects were exposed for sale; but the word has been generalised, so as to mean anybody of persons who are in intimate business relations and carry on extensive transactions in any product. A great city may contain as many markets as there are important branches of trade, and these markets may or may not be localised. The central point of a market is the public exchange, — mart or auction rooms, where the traders agree to meet and transact business. (IV.15)

Another English economist, Hayek (1937, pp. 44–45) defined the market as a complicated transfer mechanism which allows information to be much more easily and efficiently disseminated among numerous individual agents. In a similar vein, more recently, Kotler and Keller (2016) have advanced an understanding of the market as a body of existing and potential buyers of products, thus emphasising buyers. By taking all these into account, the market may be conceptualised mainly as a system of relations between sellers and buyers.

There are many classifications of markets. As also argued by Boisot (1986), many attributes can distinguish markets, according to territorial basis (i.e. local, regional, national and global); by subjects (e.g. consumer market, producer market, state institutions market); by objects of exchange (e.g. markets of means of production, markets of products and services, financial market, intellectual property market); by degree of competition (e.g. competitive, monopolistic, oligopolistic), or by the type of sales (e.g. wholesale and retail).

Additionally, Bakos (1998) has suggested that markets can be divided into physical and virtual realms. Direct physical contact between a seller and a buyer takes place in traditional markets. By contrast, a virtual market is a system of relations between sellers and buyers in a virtual environment.

Within virtual markets, the Internet market constitutes a particular case in that it can be conceptualised as a system of relations between sellers and buyers which is implemented by means of Internet-based technologies (Bakos, 1998). The specific feature of this market is that, in this case, physical contact between a seller and a buyer can be entirely excluded (Bakos, 1998). From this perspective, it is suggested that, while these markets all share the mentioned feature, the lack of contact between buyers and sellers in the virtual market conveys the virtual market as very similar to digital, Internet, network and e-commerce markets.

An e-commerce company remains the main subject of the Internet market. E-commerce is mainly understood as "buying and selling". According to a definition provided by Kalakota and Whinston (1997), e-commerce could be seen from the perspectives below:

- A *communications perspective* - payments over telephone lines, delivery of information, or products/services, computer networks or any other electronic means.
- A *business process perspective* - the application towards workflow and the automation of business transactions.
- An *online perspective* - the capability of buying and selling information on the Internet, products and other means.

A working definition of e-commerce for this thesis is "all electronically mediated information exchanges between an organisation and its external stakeholders. These e-commerce transactions are either buy-side e-commerce or sell-side e-commerce."(Chaffey, 2015). Whether trading between business-to-business or business-to-consumer, a transaction usually implicates a transfer of value between two or more parties in exchange for services or physical products. Irrespective of its location and thus blurring geographical limitations, e-commerce reaches a wide range of customers, which typically allows companies to increase their sales by selling to more consumers in more geographies, outside that of the physical company location. Furthermore, it does not involve subsidised operational costs, but instead, it effectively utilises a limited physical infrastructure, which makes it straightforward to start selling to customers in multiple geographies, just as a company would start selling locally. While most researchers consider the terms "company" and "firm" to be synonymous, other scholars distinguish between them. In turn, the present research study will advance the opinion that these concepts are synonymous.

According to § 17 of Handelsgesetzbuch (German Commercial Code), a firm is defined according to the principle that "the business name of a merchant is the name under which he carries on his business and signs his signature"(Bundesministerium der Justiz und für Verbraucherschutz, n.d.). In a more comprehensive definition, Coase (1988) conceptualises a firm as an organisation which converts original resources into the final product; however, this concept does not explain the selling of services where there is no final finished product. A more refined definition is one that includes the idea of both services and finished products. By contrast, Hicks (2001) claims that everything that is not a household is, in fact, a firm. This would include groups of individuals forming service clubs, but exclude single persons, as they would fall under the definition of a household. To further build upon this definition, O'Sullivan and Sheffrin (2003) state that a firm is an organisation engaged in supplying products or in offering services to consumers. This definition provides a wider range of possibilities for the internal structure of the firm, since the focus is shifted onto its actions and not upon its internal makeup. Since there is no agreement upon a well-established concept of an "e-commerce company", then, based on traditional definitions of the concept of "firm", the present research study proposes the idea that an e-commerce company should be understood as a separate commercial entity within the Internet market. Thus, similarly to O'Sullivan and Sheffrin's (2003) argument, it is recommended that e-commerce companies remain engaged in supplying products, rendering services and performing works via the Internet. To this end, Internet-based firms are generally considered to fall under two theoretical approaches, namely, institutional and marketing approaches, as discussed in the following section.

2.3 Institutional approach to research on e-commerce companies

Institutional theory establishes how aspects of social structure, rules, routines, and norms are established as related to social behaviour guidelines, and hence can be utilised towards developing a sociological view of institutions that would later become institutionalised organisations (e.g. Bates, 2010; McLoughlin & Lee, 2011). The theoretical description of the concept of "institutions of the Internet environment" has not yet been clearly defined in the scientific literature or scholarly works. This can be explained by the focus of the scholars in respective fields on real, rather than virtual, relationships. As a result, a wide variety of relationships and transactions established and conducted on the Internet that have not yet been properly analysed. Recent studies in the field of the virtual environment have focused on distinguishing single institutional units of the Internet environment not linked to any particular structure

other than on the system of institutions (e.g. Bates, 2010; Levy, 2009; Murugesan, 2007; Tredinnick, 2006). This is due to the novelty nature of the Internet as a phenomenon, particularly since the introduction of Web 2.0 which revolutionised both user participation and interaction as well as stamped the associated changes which have affected all aspects of contemporary life, including economic relations (e.g. Bates, 2010; Levy, 2009; Murugesan, 2007; Tredinnick, 2006). The scarcity of the theoretical apparatus does not have an adverse effect on the continuous upsurge in the scientific community's particular interest in how institutions of the virtual environment may be economically, legally or socially regulated.

Scholars such as Mitchell (1970), Veblen (1978), North (1992), Commons (2007), and Hamilton (Hodgson, 2016) laid the ontological foundation of the institutional theory. A description of institutional changes taking place against the background of the development of the virtual market was undertaken by various researchers, including Elsbach and Sutton (1992), Suchman (1995), Bakos (1998), Avgerou (2000), Bush (1987), Salazar (2005), Salmeron and Bueno (2006), Jensen (2008), Jin and Robey (2015). As such, these studies highlight the importance of information technology and its transformational effect on business in the modern era.

Before providing an overview of the research of virtual institutions, it is worth paying attention to the issue of the development of institutions typically associated with a broader concept of information technologies because this will provide a framework for the analysis of institutions overall. Institutional theory assumes that changes in the structure and business of a company are not normally based on purely economic reasons, but rather they often serve as a response to the external pressure of non-economic factors. Such factors would include legitimacy, prestige, and norms of behaviour, each of which may influence a company in using a different corporate information system towards management (e.g. Certo, 2003; Greenwood, 2008; Scott, 2008).

Several authors have explored organisational changes in companies with developing IT-infrastructure. For instance, Jensen and other researchers (Jensen, Kjærgaard, Svejvig, & others, 2008) attempted to describe the institutionalisation of the process of how companies have adapted their business to the virtual environment. These researchers applied the analytical framework initially proposed by Scott (2001; 2005; 2009; 2014), to distinguish three central mechanisms which provide the background for any institutional changes:

1. The first mechanism is a coercive (legal) framework, which is associated with the legal environment of an organisation as well as with existing standards.
2. The second mechanism is the normative mechanism, and it is due to norms connected with professionalisation: intra-organisational network communication, a similar educational background and the imitative behaviour of employees specialised in the same profession.
3. The third mechanism is of a mimetic (imitative) nature and also represents a standard response to the uncertainty of the surrounding environment and is imitative (mimetic) (Scott, 2014, p. 159).

In addition, Jensen et al.(2008) define these three different types of mechanisms as regulatory, normative and cognitive, respectively, and further associate these mechanisms with specific agents of change, as shown in Table 2.4. In addition, Jensen et al. (2008) explore the two different theories (institutional and sensemaking) in a healthcare facility where an Electronic Patient Record (EPR) system is introduced to also offer insightful glimpses into institutional theory. As a result, institutional theory assumes that an organisation should be developed throughout or during the process of creating collective knowledge (Baum, 2007), which may manifest itself through organisational structures, procedures, traditions and business processes.

An institution can be therefore understood as demonstrating the way in which the elements of a system of economics is related to the more significant whole (Hodgson, 2016). It is logical to assume that an economic institution of the Internet environment operates according to a set of well-established norms of interaction between agents in the virtual environment (Hodgson, 2016).

Table 2.4 Institutional mechanisms and agents of change

Agents	Regulatory Mechanism	Normative Mechanism	Cognitive Mechanism
System of symbols (culture)	Rules, laws	Values, expectations	Categories, typification
System of relations (social structures)	Government system, power system	Regimes, systems of the governing bodies	Structural isomorphism, identities (similarities)
Routines	Protocols, standards of production procedures	Compliance, performance, duties and responsibilities	Action plans, scenarios

Table 2.4 (Continued)

Agents	Regulatory Mechanism	Normative Mechanism	Cognitive Mechanism
Artefacts	Objects matching the specific characteristics	Objects requiring agreements, standards	Objects having symbolic value

Source: Jensen et al. (2008, pp.1-38)

It is necessary to note that the structure theorised by Jensen et al. (2008) defines the main directions of development of institutions within an industry. Nevertheless, one of the drawbacks of this approach is that Jensen et al. (2008) describe institutional structure at a high level, without distinguishing among separate units. In addition, the authors do not explain why there is no link between the single elements of the system, which is one of the reasons why other theoretical perspectives have been suggested instead.

Another alternative analytical attempt was made by Salazar (2005) who identified the specific organisational features of firms operating in the Internet environment by categorising different levels of their development, such as networks, markets and industries. To this end, he considers that, from the point of view of the network model, it is possible to use the model in the virtual environment. As studies continue to evolve, it has become more and more essential to examine the points of controversy and convergence throughout levels of an organisation. Salazar (2005) also argues that there are no precise mechanisms for construction of networks such as *customer – supplier*, *seller – sponsor*, and thus fails to consider outsourcing as an extremely frequently employed practice in the virtual environment.

Nevertheless, from the point of view of industrial development, Salazar (2005) emphasises the challenge brought about by consequences that may occur during the expansion of commerce in the virtual environment. He distinguishes between three types of factors that may have an impact upon an industry: factors at the national level, technological, and organisational factors. Specifically, factors at the national level include the culture of the society, accessibility of information as well as market- and infrastructure-related factors. They also lead to the imperative to address and meet the challenges of informational capitalism either in a legal and non-legal manner, by establishing new laws, improving investment attractiveness, or transferring foreign technologies, for instance. Technological globalisation, the extent of cooperation among firms and the worldwide exploitation of national technological capabilities

can pertain to technological and organisational factors. However, the drawback of Salazar's (2005) theory is that his scholarly study failed to identify any clear structure of institutions which can simultaneously function at all three levels.

Furthermore, Avgerou (2000) has analysed the history of technical-rational and social changes caused by the development of the IT infrastructure of a single organisation over thirty years. This study also examined the relationship between the development of information systems and organisational transformations that are considered as two institutional processes: an increase in the impulse of IT innovations and organisational efforts required to replace the established structures and processes by new ones. Yet, Avgerou's (2000) study does not examine the systematisation, or organisation of institutions, participating and thus overlooks the fact that it might have an effect on these processes. In this paper and the other studies (e.g. Jensen et al., 2008; Salazar, 2005) mentioned in the above, the systematisation of institutions of the virtual environment has been attenuated or not considered. For now, the issue of the typology of these institutions remains open, yet further analysis is required in order to fully understand institutional theory (Avgerou, 2000).

Depending on the method of implementation of information technologies, Salmeron and Bueno (2006) have identified four clusters of companies:

1. innovative (companies that transform ideas into service, new or improved product, or process in order to compete, advance, and differentiate themselves successfully in their marketplace),
2. defensive (companies for which information system or technology is essential but they do not present opportunities to be engaged in innovative activities but instead use other information systems as long as they are present on the market),
3. passive (companies which do not take into consideration the information systems related to their business), and
4. sequential (companies which do not have IT departments but do use Internet-based technologies in their business).

Salmeron and Bueno (2006) suggest that the imitative process with regard to different environmental factors is central to a pertinent understanding of key aspects of institutional theory. The

entailed imitation is based on the probability of survival of an organisation, mainly in industries with a high degree of uncertainty (Hofstede, 1984). Furthermore, it illustrates how matters stand in companies operating within the information technology industry, many of which (including companies engaged in e-commerce) use state-of-the-art systems that are difficult to implement and to operate. All of these, coupled with the continuous and accelerating process of changing technologies, give rise to the fact that organisations operating within the same industry sector imitate those organisations which have already implemented the required information technologies (Salmeron & Bueno, 2006), a phenomenon which institutional theory nominates as isomorphism (Powell & DiMaggio, 2000). Institutional isomorphism is therefore understood as a process restraining and forcing one market player to resemble another market player under the action of the similar environment (McQuarrie & Kondra, 2016). As a result of this isomorphism, organisations belonging to the same industry sector tend to implement similar information systems, which has the advantage of simplifying inter-firm communication and transfer of employee skillsets (Salmeron & Bueno, 2006).

According to institutional theory, isomorphism within the industry has its origin in the three previously-mentioned mechanisms (e.g. Mignerat & Rivard, 2009; Powell & DiMaggio, 1991; Powell & DiMaggio, 2000), namely: coercive, normative, and mimetic. Furthermore, Jin and Robey (2015) describe the process of the emergence of e-commerce from the point of view of institutional isomorphism. They also argue that curtailing wholesalers, distributors and other intermediaries in the value chain is one of the most commonly encountered early predictions of the development of commerce in the era of informational capitalism (Jin & Robey, 2015).

This “disintermediation” (i.e. liberation from the intermediate economic agents) has also revealed the prospects of how the effectiveness of supply and sales channels may be improved. More recently, data has demonstrated that such predictions have been premature, while, nowadays, new online agents (“cybermediaries”) have shown up in the value chain of products and, in practice, operate in-between manufacturers and consumers. In support of this line of argument, Jin and Robey (2015) have analysed the phenomenon of online economic agents within the scope of transaction costs economy, consumptive economy and several scientific theories, including institutional theory, social exchange theory, the theory of social networks and the theory of knowledge creation. The eradication of distributors, wholesalers, and other intermediaries was forecasted previously in the era of the information age for commerce in the value chain of any firm. This step provides higher efficiency in marketing and supply channels. Moreover, according to recent research, it has been analysed that these forecasts were not considered and new

cybermediaries have made their place within the value chain between customers and manufacturers. Jin and Robey (2015) provide insight regarding cybermediation by considering theories of consumer economics and others drawn from the science of organisation such as social exchange theory, institutional theory, organisational knowledge creation theory, and social exchange theory. With an acknowledgement of these aspects, researchers can provide a better explanation regarding the emergence of cybermediaries in the world of electronic commerce (Jin & Robey, 2015).

Nevertheless, in the environment of virtual retailing, customers have a more extensive choice of brands and products, mainly due to the fact that the influence of a limited space in a traditional store disappears. Over the past decade, with the advent of the Internet and e-commerce, it has become common that a customer's order can be placed before products are manufactured. In addition, credit cards have subsequently become the standard means of payment, thus revealing the clients' identities, a purchasing practice which further enables companies to tailor their products, services and marketing strategies accordingly. Evidently, business operations have become and are becoming more efficient through the use of IT, as also evident in the case of owners of online retail outlet who typically rely on a few fixed assets, and, in which case, deliveries from manufacturers or distributors are carried out by logistics companies.

Consequently, institutional theory can explain the phenomenon of e-retailing as a result of the process of isomorphism in which the identical structures and the same functions inherent to traditional commerce are preserved, yet in a new version. In support of this, Deephouse and Suchman (2008) argue that the organisational forms of traditional commerce may continue to persist in e-commerce, provided that they remain socially legitimate. Since retailing has so rapidly become the primary mechanism of economic exchange in industrial societies, it can be expected that e-retailing should be reproduced as an analogue to traditional commerce, under the conditions of using resources and capabilities of the virtual environment.

Besides the fact that institutions such as retailing remain in society – although in a different form – and that organisations copy each other to maintain legitimacy, institutional theory provides insights into legal and regulatory structures of society. For example, the institutional analysis of Bakos (1998) focuses on laws regulating markets by means of provisions which are related to payment mechanisms, the principles of fair trade, and protection of intellectual property, among others. Despite the fact that these institutional mechanisms will continue to be applicable to e-commerce, they will also take an entirely

different form and be characterised by distinct features or properties. For example, sellers operating on the Internet may be exempt from sales tax on inter-state transactions because they conduct a significant part of their business outside of state boundaries, while they share the same geographical location. Although these trans-boundary differences exist, institutional theory still maintains the normative conducts of business rules that were officially developed in the pre-informational era, when the geographical position and physical forms of documents played the most significant role.

Various scholars (e.g. Arvidsson & Colleoni, 2012; Fuchs, 2010; Mosco, 2009) have further studied the normative and cognitive framework for social stability in the era of informational capitalism (Scott, 2014). These theorists developed an idea of how the process of business occurs in the virtual environment, in addition to analysing expectations associated with confidentiality, security and ethical use of personal information in the course of this process (Scott, 2014, p. 159).

In this section, a number of theoretical aspects related to peculiarities presented by how economic agents operate within the virtual market environment have been overviewed from the point of view of institutional theory. To further the theoretical analysis, it is necessary to define the following fundamental concept of institutional theory, namely, the transaction costs approach.

2.4 Transaction costs

Transaction costs approach attempts to explain the costs that have arisen since the increase of supporting technologies. Transaction costs have been traditionally defined as “expenditures incurred when selling or buying a service or good”. They encompass the real cost of outsourcing the manufacture of services or products, which include contracting costs, search costs, and coordination costs. All costs are to be included and considered during decision-making, and not merely market pricing (Allen, 1998). In the present research study, the definition of transaction in the traditional sense of transaction within a virtual environment will not be used. This is because a network approach, as developed for international business and industrial marketing sectors can be overlaid with an approach to transactional costs in a present-day scenario. Such a comparison is necessary to clarify and differentiate the modern transaction from those traditionally analysed by the approach to transaction costing. Instead, an Internet transaction will be understood to mean a form of economic relationship between a type of Internet transaction and participants in the trade within the surrounding institutional environment, which come with alienation or

transfer of rights, liberty, and property by means of information and communication technologies (Johanson & Mattsson, 1987).

Regarded as the founders of the transaction costs approach, Coase (1988) and Williamson (1979) were the first to propose that the process of market-based economic exchange be considered outside the scope of the elaborated neoclassical ideas of economic cooperation of agents. Additionally, Coase has advocated that transactional cost is the cost of providing services or products through the market instead of having the same services or products provided in the firm. In support of this line of argument, he stated that:

> In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on (1988, p. 6).

This also involves transaction- or socially-related costs. To this end, Coase provides an example of agriculture as social production, and further demonstrates that, unlike other industry sectors, such as repair services, which are permanent, workers within the agricultural industry operate on more of a contract, temporary, or seasonal basis (1988, p. 219).

Many researchers (e.g. Allen, 1998; Cooter, 1989; Madhok, 2002) believe that the term "transaction costs" has been coined by Coase (1988), who developed a theoretical framework which may be applied in order to predict when firms would perform certain economic tasks on the market. However, the word combination "transaction costs" is absent in the works which Coase published before the 1970s. Instead, in his earlier research studies, Coase (1988, p. 97) used the concepts of "costs of using the price mechanism" and "costs of market transactions". The term "transaction costs" was thus extensively employed in the scientific literature on the monetary economics of the 1950s and, in this respect, various researchers (e.g. Kissell, Glantz, & Malamut, 2003) do not necessarily associate the appearance of this specific term with this particular scholar. Nevertheless, as also acknowledged by Scott (2014, p. 58) it was Coase (1988) who proposed utilising the term of "transaction costs" and conferred upon it a meaning close to the contemporary understanding of this concept.

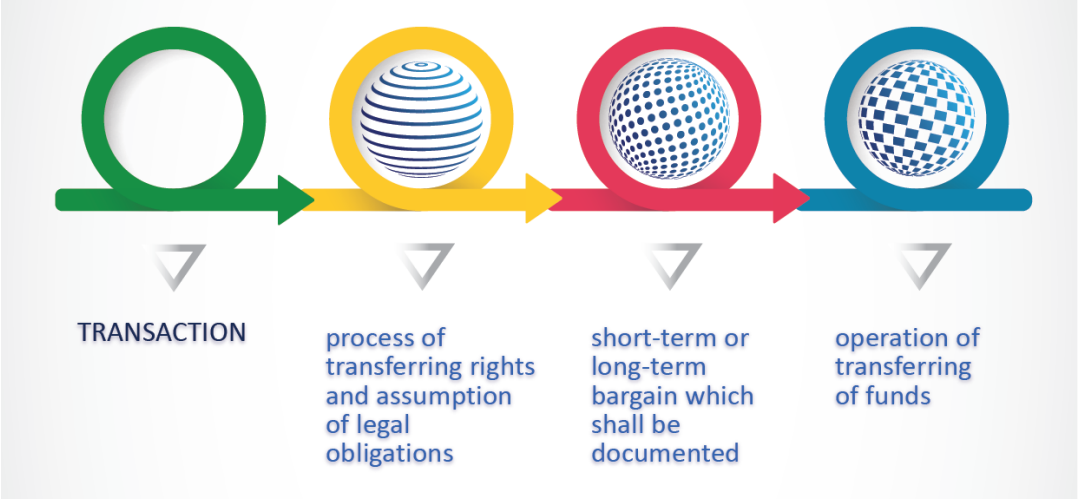
The transaction costs approach first became the most widely known through the works of Williamson (1979). More recently, in an attempt to explain the market behaviour of economic agents, transaction

cost economics has been used. The concept of transactions has been thus increasingly utilised not only in the description of processes of transactions of the "purchase and sale" type, but also in every-day emotional interactions of subjects in the informal exchange, be that exchange of gifts, for example (Dahlstrom & Nygaard, 2010).

According to Williamson (1998), a transaction takes place when a product or a service is transferred from the final point of one process to the initial point of another process which is interfacing the first one. In other words, according to Williamson (1989), a transaction is understood to also mean the transition of a product from one state to another within one firm.

Frequently called transactions, banking operations commonly involve the transfer of funds from one account to another, withdrawals of cash from an account or the rendering of other services by using a cash machine. In most cases, the word combination "transaction on the Internet" is also used to define an operation transferring funds via different online payment services (Bakos, 1998, p. 40). The wide variety of how the concept of the transaction can be understood is summarised in Figure 2.3.

Figure 2.3 Evolution of the concept of transaction



Source: compiled by the author based on Allen (1998), Bakos (1998), Coase (1988), Williamson (1979)

In a broader sense, transaction costs recognised as costs of exploitation of economic systems. These transaction costs are traditionally viewed as an obstacle to the building of markets (Arrow, 1974).

Additionally, transaction costs are the costs of arranging a contract ex-ante, monitoring, and enforcing said contract, as opposed to production costs, which essentially are costs related to the performance of a contract (Matthews, 1986).

Other authors (e.g. Furubotn & Richter, 1991; Pejovich, 1990) believe that transaction costs associated with using of institutions by economic agents as well as to creation and transformation thereof. The Internet environment also entails inherent transaction costs. However, no specific definition of transaction costs is found. Thus, transaction costs in the Internet environment shall be interpreted to mean costs which arise in the process of carrying out online transactions and incorporate expenses for obtaining information and protection of rights of online economic agents.

To this end, the following section will overview the aspects of product policy in the marketing of e-commerce companies, the marketing approach, that is, e-commerce marketing, as well as marketing tools, marketing imagination, Internet marketing and evolution of marketing will be discussed and analysed.

2.5 Aspects of product policy in the marketing of e-commerce companies

The following sections will analyse products in the context of their development under the conditions of information society. In section 1.1 product policy was defined as the broad guidelines relating to a firm's product-mix by using specific characteristics of products in order to achieve maximum revenue and maximisation of profit (e.g. Kotabe, 2009; Krishnan & Ulrich, 2001; Ulrich & Eppinger, 2012). In other words, product policy describe which products should be sold by online agents, in addition to distinguishing among the product's characteristics. Furthermore, product policy lies in the analysis of production vis-a-vis changes in external market conditions leading to substantial profit declines or increments. Consumer demand and product competition at the market are the only incentives and the only bottleneck for product policy.

To analyse the Internet-consumer market by employing the marketing approach, the following sections aim to provide an overview of and to further examine the evolution of marketing theory and its alignment with the theory of information society. Subsequently, this section explains Internet consumer market using several concepts of marketing as well as distinct phases of marketing evolution including

free market economy, simple trade era, marketing company era, production/selling era, sales/advertisement era, and strategic marketing approach, which have evolved throughout the development of economic relations. Consequently, understanding Internet consumer market throughout the development of economic relations, as it will be elaborated using the listed marketing concepts, is crucial to comprehending marketing by today's e-commerce firms.

2.5.1 E-commerce and Marketing Mix

This section represents e-commerce features inside the 4P framework while demonstrating, though e-commerce is a relatively new type of marketing and business, extends and relates to the theory that currently exists. This section is sub-divided into a section for each P, containing 1) a concise overview of that P's traditional elements, 2) a table showing the e-commerce and traditional components, and finally 3) a dialogue around the P elements in e-commerce that are pertinent to the research presented.

According to the definition provided by the American Marketing Association (AMA), marketing may be understood as the set of institutions, processes, and activities for communicating, creating, exchanging, and delivering offerings that clients, partners, customers, and greater society all value (American Marketing Association, 2013). Based on this understanding, marketing is conceptualised as a process facilitating the exchange of value between or among different parties. That is true from the derivation of the word 'marketing' from the word 'marketplace' - the notion of "marketing" derives from the English term "market" which means a marketplace. Xilouris, Trouva, Lobillo, Soares, Carapinha, McGrath, Gardikis, Paglierani, Pallis, Zuccaro L., Rebahi and Kourtis (2014) describe a marketplace as a platform, either physical or virtual, which facilitates the exchange of value. In that context, marketing can take place virtually or physically, or, in other words, in either a virtual or a physical platform.

Kotler (2008) defines the notion of marketing as the art of properly choosing target markets and appealing to, keeping and growing customers by creating customer confidence in the company. In his research studies regarding marketing concepts/principles, Kotler (2008) uses also the notion of lateral marketing, which shall be understood to refer to the technique employed to identify breakthrough market solutions. The main purpose of lateral marketing, therefore, is to develop a new product, while the company primarily aims to occupy an unusual or unique position within the market.

It is advisable to consider marketing at two levels, namely, in the micro-environment and the macro-environment of an organisation, primarily because of a series of internal as well as external factors affecting marketing activities. While the micro-environment of marketing comprises such elements with which an organisation directly deals with on a daily basis, the macro-environment entails elements outside an organisation (factors which do not interact/affect the organisation directly), including legal, economic, research and development, demographic and cultural factors. In particular, relations with suppliers, competitors, marketing intermediaries (i.e. commercial representatives, financial institutions, advertising agencies and others) pertain to the micro-environment (Parvatiyar & Sheth, 2001).

Since, the baseline information about the current market environment, the current position and the prospective market development is generated as a result of marketing activity; therefore Percy (2011) focuses on and prioritise marketing as the strategic activity of a company. Within the contemporary market, marketing activity is commonly advocated as the key to success of a commercially-viable company because it is not enough for a company to be guided by the current needs of consumers, but instead it also needs to look into, follow and challenge various marketing trends, in addition to not only defining consumers' interests, but also addressing them in the long-term future.

In turn, the free market economy is the primary motivating factor towards the development of the marketing of an enterprise. Moreover, the contemporary economic environment further encourages competition in marketing communications, which subsequently offers the majority of consumers the ability to identify companies which present, invest in and take advantage of particular technological advantages, such as "flexibility in administration and communication" (Brunn, Jensen, & Skovgaard, 2002), "convenience (24/7 accessibility)" (Deeter-Schmelz, Bizzari, Graham, & Howdyshell, 2001),and "improved customer services" (Tumolo, 2001). Under these circumstances, it can be suggested that marketing is typically cast in the role of an intermediary in building and ensuring consumers' loyalty (e.g. Chen, 2015; Leckie, Nyadzayo, & Johnson, 2016; Percy, 2011; Schewe & Hiam, 1998). Flexibility in administration of marketing activities, effective marketing communication and improved customer services are what characterises marketing development, and, in the long-run, organisational growth.

Following through with Percy's (2011) concept that the development of the key component of organisational growth, the main problem encountered in how a standard commercial organisation operates is that the marketing department only comes into existence and begins to develop in line with the company's growth, a tendency which, in turn, leads to an endless vicious circle, as marketing is used

precisely for the development of a firm rather than the other way around. The opposite tendency, to use the firm as a development platform for marketing, instead, leads to an endless vicious cycle. As a result, an organisation has no opportunity for growth, since marketing services are not developed, and marketing is not improved in quality, since the development of the organisation itself fails to be enhanced. It should be noted that, in this context, an enterprise develops and strengthens its position only if free financial resources are available, the government's support is rendered or if legislation is infringed (e.g. avoidance of tax payment, breach of the anti-trust legislation and others). Therefore, an effective cooperation with third parties within marketing environments by using various means of influence on competitors and consumers, inclusive of different marketing tools, is the principal means for a small and medium enterprises (SME) to successfully and effectively enter the market. For instance, SMEs can utilise modern technological innovations, such as social media, to penetrate new market segments. From the point of view of marketing, the integration of innovation in marketing implies that marketing has been moving towards the social/mobile marketing era, where most marketing activities occur or are enacted via social media platforms, which is making market share become highly competitive (e.g. Kumar, Choi, & Greene, 2017; Tuten & Solomon, 2017; West, Ford, & Ibrahim, 2015). In that context, social media platforms represent and function as forms of marketing tools driven by either by factors which include innovation and technology.

Marketing tools, including research and advertising, would break down techniques and materials used towards the promotion of products and services in order to enable businesses to effectively and rapidly further their success. Marketing analysis involves conducting research on the market of products and services, as well as on supply and demand, consumer behaviour, market environment and price behaviour, in order to ensure a more efficient promotion of products on the market. As a result of the advancement of Internet technology, market relations have developed through social media platforms. Consequently, various elements, such as promotional tools, have become the objects of marketing analysis. Particularly, the 4Ps and 7Ps marketing tools are essential diagnostic tools which are particularly utilised in scanning and finding solutions to the business marketing environments. The history of the marketing mix originates from research studies published in the 1940s. While Culliton (1948) defines marketing decision as a recipe, McCarthy (1960) left only four elements which have become the canonical 4Ps marketing mix tool (product, price, place, and promotion):

- *Product* – is a physical good, a service, or even an idea (McCarthy, 1960; Perreault & McCarthy, 2002);

- *Price* – is a specific amount of money transferred from a purchaser to a seller. Alternatively, an exchange of product or services might take place between parties. For example, in Forex exchange, the value of the product (currency) is more crucial than other elements of the 4Ps marketing mix because it determines the price and is independent of place and promotion. Product value is crucial, since it is at the core of customer satisfaction (McCarthy, 1960; Perreault & McCarthy, 2002);

- *Place* – it refers to a set of stores, markets and outlets with the help of which products or services are distributed. Furthermore, this marketing element regulates stock, flows of products and location of warehouses, for example, and also ensures the availability of any product when a need for such a product arises satisfaction (McCarthy, 1960; Perreault & McCarthy, 2002);

- *Promotion* – this element performs an important task, namely, it informs a potential customer about the existence of a particular product, its advantages, unique peculiarities and attractive qualities (Perreault & McCarthy, 2002). Promotion is more critical in the early stages of product development when a product is introduced on the market. That also holds true, since the target market ought to know about a certain product/service through promotion. In that case, promotion is what introduces the price, place, as well as the product elements to the target market (McCarthy, 1960; Perreault & McCarthy, 2002).

To highlight various adaptions which this seminal marketing tool has undergone, Table 2.5 presents a series of marketing mix models, including the one developed by American economist Borden (1964) who, based on surface information retrieved from market share statistics and market research reports, notably proposed 12 elements of the marketing mix, namely: product planning, pricing, branding, distribution channels, personal selling, advertising, promotion, packaging, display, servicing, physical handling, fact-finding and analysis, as outlined below.

Table 2.5 Marketing Mix Models

Model	Definition	Source
4Ps	Product, Price, Place, Promotion	McCarthy (1960)
4P+1P	Product, Price, Place, Promotion, People	Judd (1987)
6Ps	Product, Price, Place, Promotion, Public relations, Politics	Kotler (1984)

Table 2.5 (Continued)

Model	Definition	Source
7Ps	Product, Price, Place, Promotion, People, Process, Physical Environment	Booms and Bitner (1981)
8Ps	Product, Price, Place, Promotion and Education, Process, Productivity and Quality, People, Physical evidence	Lovelock and Wright (1999)
10Ps	Product, Price, Place, Promotion, People, Personnel, Purchase, Probe, Public Relations	Kerin and Hartley (2016)
12Ps	Product planning, Pricing, Branding, Place/Distribution Channels, Personal Selling, Advertising, Promotions, Packaging, Display, Servicing, Physical Handling, Fact Finding and Analysis	Borden (1964)
15Ps	Product, Price, Place, Promotion, People, Politics, Public relations, Probe, Partition, Prioritise, Position, Profit, Plan, Performance, Positive implementations	Baumgartner (1991)
4Cs	Consumer's Needs and Demands, Costs of Consumer, Communications, Convenience	Lauterborn (1990)
4As	Acceptability, Affordability, Availability, Awareness	Coca-Cola Company
SIVA	Solution, Information, Value, Access	Dev and Schulz (2005)
2P+2C+3S	Personalisation, Privacy, Customer Service, Community, Site, Security, Sales Promotion	Otlacan (2005)

Source: compiled by the author

As overviewed in the Table 2.5, there are a reasonably large number of versions regarding elements of the marketing mix. The majority of the models presented are versions of the classical 4Ps marketing mix, frequently with additional Ps added to account for the changes provided by the information age. At their essence, these theories do not utterly vary in content. In this research study, the classical interpretation of the marketing mix, product, price, place/distribution, promotion, will be adhered to. Of all the versions highlighted in the table above, the 4Ps will be viewed as the classical interpretation marketing mix tool. This classical interpretation was chosen since, as previously mentioned, the e-

commerce market has not changed the mechanisms of a traditional marketplace. A brief description of the 4Ps marketing mix for the Internet market is outlined in Table 2.6.

Table 2.6 The 4P Marketing Mix for the Internet market

Element of the Marketing Mix	Specific Features of the Internet Market
Product	Realisation of product both material and immaterial. Competition concerning product sold via the Internet arises both among other offers in the virtual environment and among offers on the traditional market.
Price	Pricing on the Internet market is similar to pricing on the traditional market, but along with this, Internet agents can save on sales areas and personnel, which can have a direct impact upon the price of product to be sold.
Place	In this case, a website is the main point of sale. Usability of the website, graphic design, popularity and other characteristics determine the successfulness of conducting business on the Internet.
Promotion	The company itself, product to be sold or the website of the company can be the object of promotion. Traditional techniques of promotion can be used, but the tools of the Internet-based promotion are mostly used: search promotion, the Internet advertising, e-mail marketing, and cooperation with the social Internet media.

Source: compiled by the author, based on Kotler and Gertner (2002)

Furthermore, Resnick, Cheng, Simpson and Lourenço (2016) found that the 4Ps marketing tool is particularly beneficial to SMEs in different ways. For instance, the 4Ps marketing tool reinforced personal branding, as a result of which SMEs owners were able to 'personify' their businesses via their unique skills, customer relations, as well as personality. Besides, it was found that the 4Ps marketing mix tool had enabled the development and the maintenance of long-term customer relationships (Resnick et al., 2016). The 4Ps has also enabled services and products to be developed in accordance to the consumer specifications, as a result of a close collaboration with consumers (promotion/customer feedback). In a more integrated marketing environment where there is selling of services as there are products, the 4Ps becomes limited and has been extended into 7Ps (people, product, price, promotion, place, processes, and physical evidence).

2.5.1.1 1st P - Product

Goldratt (2011, p. 118) contends, "the only way to make money is not through the products but through the benefits that those products bring to the customer." While Drucker (2014, p. 68) rationalises, "the purpose of a product or a service is to satisfy the customer." Doyle (1990, p. 6) clarifies that a winning brand demonstrates a "name, symbol, design or some combination which identifies the 'product' of a particular organisation as having a sustainable differential advantage." Additionally, Doyle points out that the differential advantage with the greatest amount of sustainability is service.

The Product element list provided by Kotler & Keller (2016) comprises: features & options, quality, brand name, style, product line, packaging, service level, warranty, and additional services. The brand itself, along with its extensions are significant within the notion of a product. Brand comprises ethics of trust which can be applied to either the firm or the retailer. Extensions of a brand, when leveraged properly can support the firm in progressing to novel marketplaces (Kotler, 2008).

E-commerce is an addition to the catalogue of elements. Certain attributes of a Product that support e-commerce features are: larger product line, special product characteristics, and the development of a greater number of services provided to complement the product (Chaffey, 2006). Table 2.7 compares traditional and virtual product elements.

Table 2.7 Product elements

E-commerce elements	Traditional elements
Larger product line offering	Brand name
Services added to products	Product line
Product Attributes: e.g. physical goods, search goods, time specificity	Product feature & Options
Information aspect of product	Quality aspects
Product customisation and personalised services	Warranty
	Packaging
	Service level
	Style

Source: compiled by the author, based on Chaffey (2006) and Kotler and Keller (2016)

A factor which is key in influencing the shopping inclinations of consumers is the characteristics of products (Chen, Hsu, & Lin, 2010; Perea y Monsuwé, Dellaert, & Ruyter, 2004; Sheth, 1981). Peterson, Balasubramanian and Bronnenberg (1997, p. 334) explain: "The suitability of the Internet for marketing to consumers depends to a large extent on the characteristics of the products and services being marketed." Shi and Salesky (1994) suggest a list of characteristics for products which would enable them to be successful within a digital purchasing environment. These product characteristics include: the possibility of delivering electronically, the purchase decision includes an assessment of product information (for example, via webinars), products regularly purchased and valued for convenience, unique products.

The International Classification of Goods and Services (ICGS) is the leading classification system used by the majority of countries and the main system of classification utilised in e-commerce (Platek, Thomson, & Gallup, 2004). Adopted by the Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks (International classification of product and services for the purposes of the registration of marks, 2001), it is mainly intended for the registration of trademarks. This classification of product and services consists of 45 classes: classes 1-34 comprise product, while classes 35-45 comprise services. Names of classes are generally defined according to the fields to which such product and services pertain. As suggested by Kotler and Keller (2016), the classification can be considered to be classic, in the sense that product produced within the consumer sector are characterised by using the durability and the mass character of consumption criteria, as shown in Table 2.8.

Table 2.8 Classification of product

Characteristics of Product	Type of Product	Description	Examples
By durability or tangibility of product	Durable product	Tangible products which typically provide benefits for multiple uses	Refrigerators, machinery, apparel
	Non-durable product	Tangible products which are entirely consumed during one or several usage cycles	Beer, soap, salt

Table 2.8 (Continued)

Characteristics of Product	Type of Product	Description	Examples
By durability or tangibility of product	Services	Intangible, inseparable, variable, and perishable products which normally require more quality control, supplier credibility, and adaptability	Haircuts, legal advice, and appliance repairs
Mass character of consumption	Impulse product	Product purchased without any planning or search effort	Candy bars and magazines
	Convenience product	Product purchased on a regular basis	Soft drinks, soaps, and newspapers
	Shopping product	Product which the consumer characteristically compares on bases such as suitability, quality, price, and style	Furniture, clothing, and major appliances
	Emergency product	Product purchased when dire need of them arises	Umbrellas, rain boots, medicine, snow removal shovels
	Specialty product	Product which have unique characteristics or brand identification for which enough buyers are willing to make a special purchasing effort	Cars, stereo components, and men's suits
	Unsought product	Product which consumers have no awareness of or have awareness, but which consumers typically do not intend to purchase	Smoke detectors, kitchen garbage grinders, life insurance services

Source: Kotler and Keller (2016, p. 327)

A separate category of products can be described as the information product. Information and technical progress underwent significant changes, yet now it is necessary to correlate previously-held views on information products with the current economic development and market forces. A product is a primary external article which satisfies human requirements through its characteristics, whether they are sourced from hunger or imagination (Marx & Engels, 1967). Based on Marx's and Engels' (1967) theory, it might be concluded that information and information products are products, since they satisfy specific human needs in knowledge and information, despite their lack of physical evidence. From the perspective of the company, knowledge can be disseminated to many users via online channels without having to forgo the complexity of its contents. Within a digital economy, information products, or information on its own, can be distributed and reproduced for a marginal cost of nearly zero (Altman, Nagle, & Tushman, 2015; Evans & Wurster, 1997). Nowadays information products in economy and law have come to be known as types of products whose market value is formed by the information that they contain. Information products may also include information services. Typical examples of information products are CDs with a record of music work, DVDs on which movies are recorded, in addition to computer files, books and magazines (Bakos & Brynjolfsson, 1998). An information product is often contrasted with a tangible product, such as apparel, food and cars. In turn, information products may have a material basis (e.g. paper, flash drive, magnetic tape) or do without it (e.g. electronic versions of books, magazines). As illustrated in Table 2.9, a comparison between the main characteristics of information products and tangible products need to be considered.

Table 2.9 Comparison between information and tangible products

Basis for comparison	Information products	Tangible products
Consumption	They can be simultaneously used in several processes of production (consumption) occurring in different places.	Each specific tangible product can be used only on one occasion.

Table 2.9 (Continued)

Basis for comparison	Information products	Tangible products
Production	The creation of information products does not always result directly in the appearance of a tangible product. It has no physical dimensions or coordinates in space.	Goods need not necessarily have been produced as some occur naturally; e. g., mineral deposits. Most goods may not only be produced and then stored for use at a later time but may also be transported (or transmitted) from one.
Durability	It cannot be destroyed; it is not worn physically (only obsolete); with ageing, it is no longer used.	It can be destroyed and is also subject to physical wear.

Source: compiled by the author, based on Hill (1999) and Kotler and Keller (2016)

As pointed out by Bates (1990), information may be presented either as a discrete entity or as a distinctive good. In the first case, information appears as something concrete and physical that can be created, communicated, sold, bought and destroyed. In the second case, information is unveiled as a source of knowledge, including information as the basis of all concepts and theories of economic processes. Yet, regarding information products as products, Bates argues that "[g]oods may be material or non-material, transferable or not, free or costly" (1990, p. 2). It is also evident that information can be communicated, it can have a certain usability and it can have its value as well. Consequently, it can be said that information can serve as an economic good. In this sense, it is taken into account that Shapiro and Varian (1998) consider an information product to be everything that can be digitised, including books, movies or recorded telephone communications, for instance. An information good is defined as a product which is or can be digitalised both in print and electronic format and which could be regarded as useful by economic agents. Researchers consider information products to be economic products characterised by specific features that prevent such information products from being sold on the prevailing market. The characteristics of information products thus include (Shapiro & Varian, 1998):

1. *Experience-based nature of information products*. Consumer should experience this type of products before he/she understands what they are in reality. Information goods have always

had this problem, regardless of the way in which they are delivered or packaged. Information product sellers are continuously creating methods of tackling this challenge.

2. *The enormously significant effect from the scale of production of information products*. These products have a sufficiently high fixed cost of production but a low marginal cost of reproduction.

4. *The product should highlight the benefits of using it*. This type of product should tell buyers how it would solve their problems.

5. *Information products should avoid cliché-language*. According to this principle, void descriptions, such as impeccable or excellent quality, should be avoided, as this type of descriptive language turns off buyers.

6. *They should tell stories which are powerful and thus grab the buyer's attention*. Simple and short stories which consumers can easily comprehend will mark the beginning of the relationship between the brand and the client.

To the characteristics suggested by Shapiro and Varian (2003), the present research study would list one additional feature of information products: *if information products are of intangible nature, they can be transferred to customers within the shortest possible time, which significantly decreases the transaction cost component of the process of exchange*.

Consumers purchasing via e-commerce channels need to be open to purchasing products while skipping the step of visiting a retail establishment (Benjamin & Wigand, 1995). Consumers have demonstrated a fondness for buying certain items via traditional means in order to touch and feel the item prior to purchase. For instance, clothing (Rhodes & Carter, 1998); or experience goods (Peterson et al., 1997). In contrast to earlier findings, recent studies show that the millennials do not mind to buy products online (e.g. Hall, Towers, & Shaw, 2017; Moreno, Lafuente, Carreón, & Moreno, 2017). Flavián, Gurrea and Orús (2019) demonstrated that high involvement purchases drive the consumer to comprehensively search the Internet to find the product that may be the best match for his/her needs. However, the consumer still has to visit the store to confirm that the researched information is accurate and verify that the product is the best choice. Taken together, these results suggest that experience goods are not continually a good fit for e-commerce retail. Once a consumer has purchased an experience good

several times, the good can make the transition from physical purchase to a digital purchase environment.

Additionally, Peterson et al. (1997) provides a categorisation of services or products called *search goods*. This category of *search goods* lends itself to assessment through information provided externally. Within an e-commerce platform, this category of products is a good fit. Items that lend themselves to easy description and therefore are closely related to search items are well suited to e-commerce (Benjamin & Wigand, 1995; Huang, Lurie, & Mitra, 2009).

Alba, Lynch, Weitz, Janiszewski, Lutz, Sawyer and Wood (1997) point out that digital retailers can deliver greater amounts of information regarding the products they sell than their bricks-and-mortar counterparts. They affirm that information around products is consistently available and accurate, as compared to the variable product knowledge and service levels provided by employees. Product information accessed online enables consumers the choice of information sought at the depth they prefer. Alba et al. (1997) posit that such data enables, 1) competitive differentiation amongst e-retailers, and 2) competitive advantage beyond the service provided by traditional retailers. Considering the magnitude of product knowledge, a company can store, and consumers can search within a digital platform. In addition, providing this information digitally should come at a lower cost than training multiple employees to deliver it.

Shopping by comparison is made easier on a global scale in e-commerce (Palumbo & Herbig, 1998; Quelch & Klein, 1996), since the selection of products is based upon matching consumer needs with product attributes (Malone, Yates, & Benjamin, 1987; Mandl, Felfernig, Teppan, & Schubert, 2011). Nonetheless, certain consumers leverage online for search, while going into the store to complete the purchase itself (Pauwels, Leeflang, Teerling, & Huizingh, 2011; Westland & Clark, 1999).

A large quantity of articles exist discussing how data, in combination with an item, can develop both into an asset strategically and as a platform for competitive differentiation (Porter & Millar, 1985). Glazer (1991) and Sampler (1998) apply this notion within the digital world in their work. Data acquired from transactions (e.g. the buying history of consumers), is an advantage leverageable in selling supplementary services or products to consumers, as well as saleable to third party firms (Glazer, 1991). Sampler (1998) posits that digital firms maintain a competitive advantage over traditional retailers in

their capability of capturing all data provided by consumers. Therefore, future purchases are prompted through concise consumer recommendations.

Items sold on an e-commerce platform enable an e-commerce firm to acquire the consumer's history of buying in a detailed way (Akter & Wamba, 2016; Gonçalves Curty & Zhang, 2013; Hoffman, Novak, & Chatterjee, 1995). While in traditional retail stores consumers maintain the option to pay in cash and retain privacy, e-retailers perpetually maintain a register of consumers' purchases, thereby maintaining a competitive advantage in comprehending consumer preferences (Whinston, Stahl, & Choi, 1997). Such data enables an e-retailer to provide customised items or enhance the management of its categories. Malone, Yates and Benjamin (1989) claim that when items are tailored to a consumer, they have less motivation to engage in searches for alternatives.

2.5.1.2 2nd P - Price

Within the marketing mix, Price elements include price levels, discount and allowance policy, payment terms (Kotler & Keller, 2016). Such Price elements are also applicable in the virtual world (Jarvenpaa & Todd, 1996). Table 2.10 compares traditional and e-commerce elements of pricing. The remainder of this section focuses on the e-commerce Price elements.

Table 2.10 Price elements

E-commerce elements	Traditional elements
Dynamic and customised pricing	Level
Facilitated price searches	Discount and allowance policy
On-line price negotiations	Payment terms
Lower distribution cost	
Delivery charge for physical product	
Channel fee (to bias either virtual or brick transactions)	
Credit card is the predominant payment medium	

Source: compiled by the author, based on Chaffey (2006) and Kotler and Keller (2016)

Virvalaite, Saladiene and Skindaras (2009) mentioned pricing as being the most significant factor in defining the satisfaction of consumers. When taking account of the obtained value of a product or service, customers most frequently consider its price. Nakhleh (2012) confirms that an item's price is the value relinquished to obtain an intangible or tangible product. The amount customers will accept parting with fluctuates according to their differing needs. Therefore, perceptions of price regarding similar intangible or tangible items may be different between individuals.

The dynamics of pricing services and products sold online is changing rapidly. This can, in part, be attributed to the ever-increasing utilisation of auctions in consumer and business markets to sell excess inventories, commodities, rate collectable items, and used merchandise (Kannan & Kopalle, 2001). Marketers use dynamic pricing for services and goods that sell for posted prices, encouraged by the inferior listed costs of different web prices. They are also responding to the use by consumers of internet bots (automated software) designed to compare prices. An examination of the significance of dynamic pricing within a digital economy can be done by comparing the virtual value chain, which is information-based, to the physical value chain. Dynamic pricing impacts consumer markets from the viewpoint of the consumer's price expectations, a consumer's response to price across varied categories of product, and the role that information plays in a consumer's learning curve (Kannan & Kopalle, 2001).

For example, online sales channels have a crucial impact on car rentals (Oliveira et al., 2015). E-brokers that are tasked with comparing prices within a marketplace are especially important. Occupational concerns ought to be combined with quick responses to changes in prices within a market since costs are highly correlated to an unoccupied fleet. A tool has been developed to adapt car rental company's prices to quickly increase the total value of the fleet, based upon the specifics of the car rental problem, as described above (Oliveira et al., 2015).

It is also worth paying attention to the issue of cost of information products as products. Information-based businesses are based on information as the product. As such, since information is viewed as a product, it is marketed very differently as products and services, as it has unique properties, given that it is intangible and imperishable, as opposed to other services, which are simply intangible. It is also crucial to note that the sophisticated nature of information products lies in the fact that they have non-product contents against the availability of product form. Usability – or use value – of information products is due to the fact that the product can be used as a resource for creating other intangible – or in this case, information – and material values (Stewart, 1999).

By virtue of living in an information society, where most information is freely and easily available through handheld devices, problems are generally related to access. Information plays a wide range of roles in the economy: “the analytical structure of microeconomics includes "perfect information" – meaning free, complete, instantaneous, and universally available – as one of the defining features of the perfect market” (Boyle, 1996, p. 35). In this case, it is presented as publicly available and the most complete. On the other hand, real markets frequently need information due to the current need for information as a product, i.e., markets directly need information products.

According to Strader and Shaw (1997), digital markets engender a decrease in pricing since they increase access to information around pricing. E-commerce enables access to digital information regarding prices, which can be updated dynamically. This enables consumers to rapidly perform price comparisons for numerous vendors, thereby putting customers in a more powerful bargaining position (Strader & Shaw, 1997). As Strader & Shaw (Strader & Shaw, 1997, p. 189) note: "an electronic market provides a mechanism for reducing the search costs (money, time and effort expended to gather product price, quality, and feature information) for consumers. This also reduces the likelihood that sellers can charge significantly higher prices than their competitors because the consumer is unaware of the other prices (a form of regional oligopoly or monopoly)”. Baye, Morgan and Scholten (2004) found that the observed pricing behaviour of firms in online environments resembles consonant with a “clearinghouse model” in which firms change price levels randomly to create a contingency for other competitors.

Dutta, Kwan and Segev (1998, p. 546) provide an appropriate summation of pricing within an e-commerce environment, "Pricing is an area where most organisations have done very little beside displaying prices online. As a customer engages in real-time interactions with organisations, it is conceivable for customers to negotiate prices directly with organisations. As organisations learn more about specific customers, these prices can be set uniquely for individual customers...The Marketspace increases the transparency of prices to customers and will require organisations to rethink their pricing strategies".

As noted by Costello and Tuchen (1998) e-commerce will develop into the majority exchange amongst consumers and business, since it can significantly decrease a product’s distribution costs, therefore enabling a possibility for cost advantage as compared to traditional retailers. Total costs of 40-90% can be reclaimed over that of traditional retailing. Bollier (1996) measured the costs of distribution to be 50-80% of the cost of a consumer product, a more narrow range.

2.5.1.3 3rd P - Place

Within the conventional Place element, included are: distribution, distribution channels, sales territories, outlet location, locations, inventory levels, and transportation carriers (Kotler & Keller, 2016). Place includes the actions a retailer should take into account to ensure their products are both available and accessible to consumers. Kotler (1997) references Lauterborn (1990) who proposes the existence of a correlation amongst the consumers' view regarding convenience as equivalent to the retailers' view of Place. Refer to Table 2.11 for Place elements.

Table 2.11 Place elements

E-commerce elements	Traditional elements
Online ordering available	Sales territories
Eliminates place limitations	Outlet locations
Removes time limitations	Distribution coverage
Potential channel conflict	Distribution channels
Internet geographically available	Inventory levels and locations
Internet access device	Transportation carriers
Delivery implications	

Source: compiled by the author, based Chaffey (2006) and Kotler and Keller (2016)

A firm can espouse various channels to deliver its intangible or tangible product to consumers (Kotler, 2008). Indirect or direct channels can be leveraged. The selection of a channel has a significant effect upon sales (Keller, 2013). A firm must consider all of the sales avenues available to them and the pros and cons of operating in one versus a multitude of sales venues. Going hand in hand with that decision, firms' must also consider not only their knowledge and ease with each venue, but also their customer base's ability and trust with each potential venue for a product's place as well as the network effects of each place option.

Within the realm of traditional retail, the elements of Place and the area of trade associated with it include: the percentage of consumers within a shopping district as compared to the depth and breadth of offered merchandise, the percentage of customers who shop corresponding with their traveling distance, and a competitive shopping district's influence (Huff, 1964). However, in the digital world, the meaning of Place has been revised. Distance according to geography means less within the space of the market, as explored below.

The Product section examined how e-retailers could carry a greater range of products with greater ease and how bricks-and-mortar retailers were confined to shelf space limitations inside a store's physical space. Within the digital world, the Place is a virtual marketspace in which a consumer can place an order, as opposed to a traditional storefront (Goel, Johnson, Junglas, & Ives, 2011). Dutta and Segev (1999) examine Place marketspace with the capacity of ordering online products, distributing on-line products virtually, and processing secure online payments. Within the marketspace, a value exists for both the information connected to the items, as well as the items themselves (Rayport & Sviokla, 1994).

From the perspective of the consumer, no reference exists for distance physically within this digital space (Pritchard, 1999). Nonetheless, Pritchard explains a website can pose a firm inside a place physically, by concentrating upon the firm's roots geographically, and inside the digital space by concentrating upon a worldwide orientation.

A digital Place has the following advantages over a traditional Place: capability to maintain current product information, enables direct seller and buyer connection, interactivity allowing a dynamic adaption to consumer behaviour by retailers, and elimination of place and time limitation (Peterson et al., 1997). The e-retailer can deliver better service to customers, since websites are available 24/7 (Costello & Tuchen, 1998; Kim, Kim, & Kandampully, 2007). Kotler (1999) develops this idea by highlighting that travel time and time finding parking are removed, convenience is also maximised by a consumer having the ability to order 24/7. These benefits, which are desirable to consumers, are the equivalent to time and cost savings (Benjamin & Wigand, 1995; Kotler & Keller, 2016). Angelides (1997) asserts that product information can be obtained with fewer costs in searching than in making a purchase from a physical location.

E-commerce companies compete within two realms, the virtual and the geographic physical. A possible competitive advantage of e-retailers is providing time savings for consumers (combining

acquisition, order, and search times). An attribute of competition amongst traditional retailers is a consumer's time spent in driving to the store (Place). With an increase in distance, the quantity of alternatives available rises and competition thereby rises (e.g. Jayasankaraprasad, 2011; Park, Smith, & Iyer, 1989). Leveraging this notion within the digital realm, the more lengthily the travel time for a customer to reach a traditional retailer (physical Place), the greater the possibility of competitive advantage in acquiring the item via a digital channel (virtual Place), considering the increased time savings.

Porter (2011, p. 57) points out: "anything a company can access from a distance is no longer a competitive advantage, because now everybody can access it". Toffler, Toffler and Gibson (2011) agree that technology will make geographic location irrelevant. Bakos (1998, p. 41) claims that " [a]s geography becomes less important, new sources of product differentiation, such as customised features or service or innovation, will become more important, at least for sellers who do not have the lowest cost of production.".

2.5.1.4 4th P - Promotion/Communication

Finally, the fourth P – Promotion or marketing communication – is vitally important, as it is the means by which firms drive demand for their products or services and thus stimulate revenue and growth. Promotion concentrates on advertising and the merchandising of products. Components of Promotion include: sales promotion, advertising, publicity, and personal selling (Kotler & Keller, 2016). Examples of promotion include: coupons to save money, loyalty programs, and advertisements of unique sales (Kotler & Keller, 2016). Promotion models are applicable to the world of e-commerce, and, as this section will address, traditional promotions are significant in driving many customers to location e-retailers initially. Refer to Table 2.12 for e-commerce and traditional elements of promotion. This portion concentrates upon the tools for promotions which differ within the digital world.

Table 2.12 Promotion elements

E-commerce elements	Traditional elements
Well publicised, easy to locate website	Advertising
Online advertising	Sales promotion
Online promotions such as sales and discounts	Personal selling
Customisation of online promotions	Publicity

Source: compiled by the author, based on Chaffey (2006), Kotler and Keller (2016)

Components of virtual Promotion, encompassing advertising online and several features of promotions online: customisation, sales, firm partnering, and consumer participation (Dutta & Segev, 1999; Rowley, 2004). These notions will now be explored in the subsections that follows: online advertising and online promotion.

2.5.1.4.1 Online advertising

Advertising on the Internet (links to additional services, corner ads, and banner ads) is considered to be a worthwhile medium of its own merit (Ellis-Chadwick & Doherty, 2012, e.g.; Yan, 2010). A unique value of advertising online is to leverage pull model metrics by directing ads to customers searching for specific types of products (VanHoose, 2011).

McCandless (1998) proposes aspects which make online advertising unique. Considering every ad is directed at an individual, bespoke content can be created. Due to the interactive and real time quality of an online advertisement, nearly instantaneous adaption can be coordinated to feedback. An ad can be altered and re-tested, if it proves ineffective on a particular site. The arguments provided by McCandless (1998) are related to market segmentation and assembling consumers with comparable buying behaviour and needs into segments in order to reach them with focused marketing messages (Kotler & Keller, 2016).

E-retailers can position ads in numerous virtual and physical locations to increase awareness of a service or product. They promote their website's name to enable consumers to locate them within the

marketspace. Advertising off-website includes television and newspapers. Internet gateways or portals, including MSN, Yahoo, and Google collect great quantities of ad revenue due to their high traffic volumes (McCandless, 1998).

Utilising an eye-tracking methodology, Drèze and Hussherr (2003) examine the processing of banner ads. Their conclusions propose that consumers tend to direct attention on a computer screen in a manner that urges banner ads to the edge of their visual field (see further Lam, Chau and Wong (2007) for an eye-tracking study of how consumers treat an array of thumbnail images from left to right). Hence, as the processing of certain banner ads implies to be at pre-attention levels, brand awareness and ad recall are more suitable measures of advertising effectiveness compared to the traditional measures based on click-through rates (CTR).

Briggs, Krishnan and Borin (2005) comprehensive case study shows that firms can assume a good return on efforts aimed at carefully organising online advertising with other channels such as television, radio, and print. Such efforts determine a firm's online visibility (Drèze & Zufryden, 2004), a fundamental determinant of traffic levels at the websites of firms.

2.5.1.4.2 Online promotion

Multiple articles discussing the content of retailers' websites mention content related to product as well as information valued by consumers which may or may not be related to products (e.g. Hasley & Gregg, 2010; Kincl & Štrach, 2012; Thongpapanl & Ashraf, 2011; Verhagen, Boter, & Adelaar, 2010).

Jarvenpaa and Todd (1996) offer suggestions for website content that is focused on product. They advise to design the site by thinking from the consumer's perspective. They provide recommendations about content that includes customer testimonials, assurances and information regarding product quality, as well as detailed and rich descriptions of the product. This is analogous to the suggestion provided by Kalakota and Whinston (1997) that, to be meaningful to a consumer, product information should be given in context to that product's consumption. Jarvenpaa and Todd (1996) also advocate, from the perspective of product and competition differentiation, digital retailers: concentrate on items which have an advantage in cost through decreased delivery and distribution costs in e-channels, highlight products with a brand-name, have comparable depth of product offering to the websites of competitors, deliver

inter-store purchasing prospects of associated items to one customer, and provide discounts (with the exception of hard-to-find or unique services or products).

E-commerce offers a mechanism for retailers to enhance their relationships with customers by providing customised offerings, anticipating needs, and comprehending preferences (Burt & Sparks, 2003). Online customisation has yet to be matched by competing media. The best e-markets are personalised ones in which consumers use customised support in decision-making (Benjamin & Wigand, 1995).

2.5.1.5 Concepts of marketing theory

Various internet marketing principles such as realisation of the goals of marketing with the utilisation of digital technologies have a direct impact on marketing activities and the environment (Chaffey, 2006). Additionally, it should also be considered that companies have their own meaning in terms of internet marketing and e-commerce marketing. A company operating within a traditional and virtual market can implement internet marketing in order to boost the effects of the website upon the target audience, which can be considered as an Internet-based approach. The marketing employed by e-commerce companies implies a comprehensive marketing activity of an Internet-based company aimed at effectively improving communications with potential customers so that profits are subsequently increased. For example, a global company like Google markets its Internet-based services by also utilising traditional mass media in addition to various commonly-used tools of Internet marketing (Bryant & Levine, 2017). In other words, Internet marketing only partly represents the wide range of marketing strategies that can be employed by e-commerce companies. In the present study, however, e-commerce concepts are used interchangeably with Internet-based strategies, since they convey similar meaning in terms of marketing activities.

The evolution of marketing concepts (Table 2.13) shows that, as economic relations develop, the reference point shifts from production and product to both addressing and meeting consumers' needs and also to social responsibility. Depending on their strategic objectives, competitive advantages, market behaviour and other factors, all of the concepts can be used by companies in order to gain competitive edge.

Table 2.13 Concepts of marketing theory

Name	Reference Points	Tools	Objectives
Production concept	Methods of production	Prime cost, efficiency	Improvement of production, sales growth, and profit
Product concept	Quality of product	Product policy	Improvement of product quality, and improvement of its features
Selling concept	Distribution channels	Sales policy, promotion	Sales increase
Marketing concept	Needs and demands of consumers	Marketing research	Ensuring consumer satisfaction and meeting consumers' needs
Social marketing concept	Customers' needs and demands and level of well-being in society	Marketing research, analysis of the consequences of production and sales of products	Ensuring consumer satisfaction and meeting consumers' needs, a solution of socially important tasks
Concept of relationship marketing	Customers' needs and demands and interests of all the parties concerned	Marketing research, methods of coordination, integration and network analysis	Meeting consumers' needs, as well as the interests of partners and of the state

Table 2.13 (Continued)

Name	Reference Points	Tools	Objectives
Concept of holistic (coherent, integrated) marketing	All aspects of marketing activity	Marketing research, analysis of the consequences of production and sales of products, moreover, market activity planning	Ensuring consumer satisfaction and meeting consumers' needs, a solution of socially important tasks, assessment of a company's marketing activity as a system. Each component has an impact upon the efficiency of the entire process.

Source: compiled by the author, based on Berry (1995), Kotler (2000), Kotler, Keller, Brady, Goodman and Hansen (2009)

The idea of a Simple Trade Era (Production concept) was first introduced in 1950. Described as the production concept by Adcock, Halborg and Ross (2001), it strengthens the idea that the firm emphasises the process of production which entails more production of services and goods. Additionally, this concept is based on rules of economies of scale and it may be implemented specifically when the demand for products and services exists. According to these concepts of simple trade, managers would divert their efforts to the improvement of production along with the effectiveness of distribution channels. As most products were either homemade or harvested, the limitation of different products in various segments of the market makes experimentation, along with the exploration, the main focus for the economy.

The second concept (Product concept) goes back to the 1960s and considers the launch of product by the company. This phase specifically considers that the company is focused upon the quality of the product or service (Adcock et al., 2001). The number of consumers increases as more products attain high-quality standards. Based on these concepts, the producer of a product makes sure that when it is launched, it is launched with a strong unique selling proposition (USP).

Proposed at the same time as the previous concepts were proposed, yet, the Production/Selling Era (Selling concept) is different from the others in a sense that firms focus more on the process of production than the cost of marketing. According to Fullerton (1988), it also interferes with the previous marketing practices as carried out by Marketing Era concept. Within the Production/Selling Era, the firm is focused primarily towards the progress of distribution channels (Adcock et al., 2001). Within this marketing type, the number of products sold is directly related to the number of channels. In the case of production era, major attention has been given to physical production at the cost of marketing activities. The quality and supply are considered as the main concern. Major attention was paid to production in the 1930s, due to higher demand for supplies, while it is not the case in 1970s, as by that time, advertisement was becoming more prominent (Adcock et al., 2001; Fullerton, 1988).

Developed in the 1970s, the fourth concept is often termed as the Advertisement Era (Marketing concept) perspective. The company's main priority in this era is the definition of various needs and specific demands of various market segments. Additionally, the anticipated satisfaction of the market will be attained with the implementation of innovative and efficient methods rather than by implementing methods employed by the competitors of the company. Hence, it makes the company pay attention to the needs of customers and, rather than focusing solely on the production of goods. The primary activities are performed through marketing research, along with the analysis of the results gathered. Depending upon these results, the profit of the firm will be influenced by the level of satisfaction of customers. If there is a greater number of customers satisfied, higher profits would result (Kotler, 2000; Kotler & Keller, 2016).

According to Adcock et al. (2001), the earliest appearance of the Marketing concept is marked by the branding of domestic animals, which further signified their ownership by the farmers. The theory of branding has evolved to encompass every single consumable good, from milk to shoes. Apart from the type of product, it is branding that enables consumers to differentiate the origin and quality of the product. Fullerton (1988) posits that the concepts defined by the Marketing concept confuse the development of previous marketing practices, as they were carried out by production era.

Along with solving the issue of meeting the needs of customers by implementing more efficient methods than competitors, the welfare of customers and the positive addition to society also plays an important role in understanding the concepts of marketing normally termed as social marketing (Social marketing concept). In the beginning, the term social marketing was used only for considering the ethical

and social perspective of marketing in the early 1970s (Kotler & Keller, 2016). Recently, the term social marketing has been used in order to refer to various socially responsible marketing approaches carried out by economic agents, which are responsible for finding the solutions related to social issues and focus on the development of society. The concept has gained a lot of attention due to its focus on issues such as lack of natural resources, increased pollution. The idea of corporate social responsibility along with the ethical features of marketing tackles three main constituents: registration of profit by the firm, the satisfaction of customers, and the interest of the public. These concepts combine to create relationship marketing (Berry, 1995; Kotler, 2000; Kotler & Keller, 2016).

Relationship marketing can be analysed back to 1990s, when tools such as marketing to stakeholders and workers, targeting profitable customers, and building of trust among stakeholders began to be developed as optimal (Berry, 1995). The concept of relationship marketing focuses on developing and building a long-term relationship with major key parties such as distributors, suppliers, and customers in order to gain profit and retain business (Kotler, 2000). As companies implement a relationship marketing strategy, network marketing can be implemented from four major elements: employees, customers, marketing partners (e.g.: suppliers, distributors, and dealers), and members of the financial community of the firm (e.g.: analysts, investors, and shareholders) (Kotler et al., 2009). As a result, communication with customers and other parties would become a marketing objective rather than a mere decision implying that the main aim of marketing is to consider needs of customers, while considering the interests of company stakeholders. The special case of the related concept of spatial marketing has been defined below:

> Spatial marketing is viewed as a process of development and optimization of the spatial hierarchy of social and economic relations between economic actors about the search, production, distribution, and consumption of unique values, taking into account the factors of development needs, resource management and social development. (Bagiev, 2014, p. 3)

The capacity to create and improve the layout of a space assigned to economic and social relationships within a collection of commercial players, supports the concept of these players as important visual elements within the management of the brand. The creation of a brand is about complying with the strategy of its parent company and not merely selling a product or service to consumers for a specific period of time.

Drawing upon the main characteristics of contemporary society, the concept of strategic marketing encompasses several concepts at once. Defined by Kotler and Keller (2016) as the holistic marketing concept, the concept of strategic marketing advocates and treats marketing as a sophisticated activity or a set of marketing programmes which require a broadside and comprehensive approach to the development and implementation of such programmes. This particular marketing concept includes four components: relationship marketing, internal marketing, integrated marketing and socially responsible marketing.

It should be noted that the holistic marketing concept has been developed during the period of rapid development of information technologies. Due to this connection and new trends, several studies consider the global network within the context of marketing activity of the enterprise as a new additional distribution channel, communication channel and a tool of marketing (Kotler & Keller, 2016). Therefore, in the process of marketing evolution, change of the reference points takes place after improving various methods of production to identify and meet consumers' needs.

Focusing on mass production products alone, which constitute the B2C market, one can reason that Kotler and Keller's (2016) classification overlooks the type of information contents of product and services. Rather, Kotler and Keller (2016) argue that products should be identified strictly by using the aid list of classes, function, and purposes. Along several research studies, it then follows that it is essential to enhance the informativeness of the product (Chung & Shin, 2008).

Advertisement via the Internet market would make information more accessible for potential consumers as compared to traditional techniques of creating awareness. As demonstrated by Coupey (2001), an increase in the accessibility of information by means of web-based technologies has the potential of increasing the scope of knowledge which online users may have about products. Moreover, in this case, consumers can make a decision of purchasing better quality, which is why consumers are subsequently satisfied to a greater extent with the purchases made.

In the following sections, the present research study will further focus on identifying a set of peculiar characteristics which impact the sale of products available online.

2.5.2 Identification of factors impacting upon product competition among e-commerce companies

This section presents an analysis of a number of factors that can influence the market of Internet-based products, using the software market as an example. By doing so, it demonstrates what particular set of factors have an influence on the popularity of the Internet environment.

As previously noted, product competition is the natural stimulus and limiting factor for product policy. The consumer is geared onto various specific external signals that help him/her to opt for one or another product, as a result of which companies would need to ensure that such choice is the right choice for the consumer. The first factors to be analysed are those which have an impact upon the Internet-based companies or the products available on the Internet through the example of the software market below, and the accompanying list of software categories. According to Zhu and Kraemer (2002), all external signals on the software market can be broken up into signals which are provided by software developers (e.g. brand, category, advertising) and signals which originate from other sources (e.g. opinions of critics, reviews of other customers).

2.5.2.1 Category and functional product characteristics

When searching for software products, any user, firstly determines to what category such product pertains. In turn, the category of the software determines the target segment of the software market. The following categories of software can be distinguished, as indicated below (Ceruzzi, 1999; eduCBA, 2015; Souza & Maia, 2013):

- security software;
- browsers;
- business applications;
- communications software;
- desktop gadgets;
- development tools;
- digital photo tools;
- education software;
- entertainment software;

- graphic design software;
- home software;
- Internet applications;
- music software;
- computer performance measurement software;
- utility software and operating systems;
- games;
- video software.

A noteworthy detail is that the more computer-experienced a user is, the higher aspirations he/she has concerning the functionality of the software. For example, ordinary users do not pay attention to the difference between the functionality of chargeable Windows operating system and Linux freeware, but instead choose the one that is the most popular in society, to be precise, Windows. However, network professionals prefer to work with Linux-like systems, since such systems are more superior and less complicated than Microsoft. Not only does Linux system ensure higher failure tolerance, but also data is stored securely on the servers and can be retrieved upon a simple press of a button (Wheeler, 2015). In contrast, ordinary users encounter barriers, due to their lack of awareness of less-common software products, and they may be reluctant to switch over to a system little known to them (Wheeler, 2015). Another insightful example can be provided as related to the category of anti-virus software. A study by OPSWAT (2017), a software company, reports that approximately 21% of users give preference to Avast! Free Antivirus and Avira Free Antivirus freeware and confirmed that Internet users typically prefer to use free-of-charge anti-virus software.

Various software categories are characterised by their performance features and their impact upon consumer preferences. Therefore, in the present research study, information products will be referred to as products which are of tangible or intangible nature and whose value is attributable to the information behind such products. It should be noted that the majority of products available on the Internet may be considered Internet products by definition as well as information products. Thus, it is important to note that information products and products available on the Internet are not identical notions.

Information products can be classified according to a variety of characteristics: by a form of presentation (i.e. tangible and intangible), by function-based use (e.g. entertaining, movies, games), application-oriented (e.g. reference books, databases). The numerous numbers of criteria are used to

ensure that there is sufficient consumer choice and customers can easily find the product which they are searching. The genre is one of the essential elements that create consumer demand in the market for computer and video games. Most importantly, indeed, genre is related to the fact that there exists a wide variety of consumer tastes. In addition, specific genres become best sellers at different times. For instance, Sacranie (2010) points out that first-person shooters have become the most popular games. Although the study does not provide specific statistics, it is argued that realism of games of this genre is the reason why the player is by definition the main character. As such, the player cannot see himself on the screen, and it appears that the player is himself in the virtual world (Sacranie, 2010).

It has also been suggested that the importance of the design of software products under a familiar brand in the gaming industry has been growing year by year (Sacranie, 2010). Regarding the video games industry, a brand may be understood as also comprising a game's sequels and any variations of the game. The main reason behind the growing success of a brand is the increasing production cost of video games. In recent years, a rising number of developers have tended to avoid risks associated with numerous failures of newly-created games. Even for large manufacturing corporations, it is getting costly to produce games which fail in the consumer market (Sacranie, 2010). That is why developers have gradually resorted to the creation of sequels that, to some extent, guarantee the success of sales. It is easier for developers to predict commercial success of a game when the respective sales figures are available or accessible. The weakness of this instrument is that there are no flows of innovative ideas into game sequels, a tendency which can eventually result in a decline in consumer demand for such games. However, nowadays the release of sequels is an essential factor which supports and therefore must be taken into account by the entire game industry (Sacranie, 2010).

Compared to the competition of genres in the movie industry, where action movies, comedy and melodrama generally enjoy enormous popularity, the demand for games, based on the genre criterion, typically changes. Therefore, a change in demand for different games can be explained by a set of characteristics of games, including freshness, ingenuity and technical capabilities. The temporary growth of demand for any specific genre is also possible in connection with the market entry of movies or books concerning which games are created. For example, in mid-2009, the horror genre became popular in the world of games. Connected with the release of the "Resident Evil 5" movie, it led to record sales of the namesake game for personal computers and game consoles, thus resulting in the fact that 1.94 millions of copies were sold within the course of several months (Gaudiosi, 2009). It is thus suggested

that multiple external factors, such as theatre movie affiliation, make it rather difficult to explain game sales during a specific period.

Furthermore, Sacranie (2010) argues that manufacturers can overdo and glut the market with new product, such as games of a specific genre. Under these circumstances, a direct link between sequels and game genre can be identified. An example would be *Guitar Hero*, a series of music video games. In 2005, this game generated a lot of buzz within the market. Initially, producers offered different games in the music video game genre, but they failed to become popular. However, "Guitar Hero" sent sales of games of this genre higher. The reason could be exactly that this niche market was unoccupied and any well-designed product, such as "Guitar Hero", managed to revive consumer interest in this segment. By 2007, users on the North American continent had almost entirely wrapped up this segment. In particular, "Guitar Hero II", a sequel to this game, released to be compatible with Xbox 360. As of December 1, 2007, the game has sold over 3.1 million copies, which is a remarkable achievement for a console game title (Pedersen, 2009). However, this game gave rise to a heavy stream of similar games, which eventually ended consumer interest in that specific genre. In 2009, "Guitar Hero 5", the last sequel, registered sales of 800,000 copies, which was far from the success of its predecessors (Sinclair, 2009).

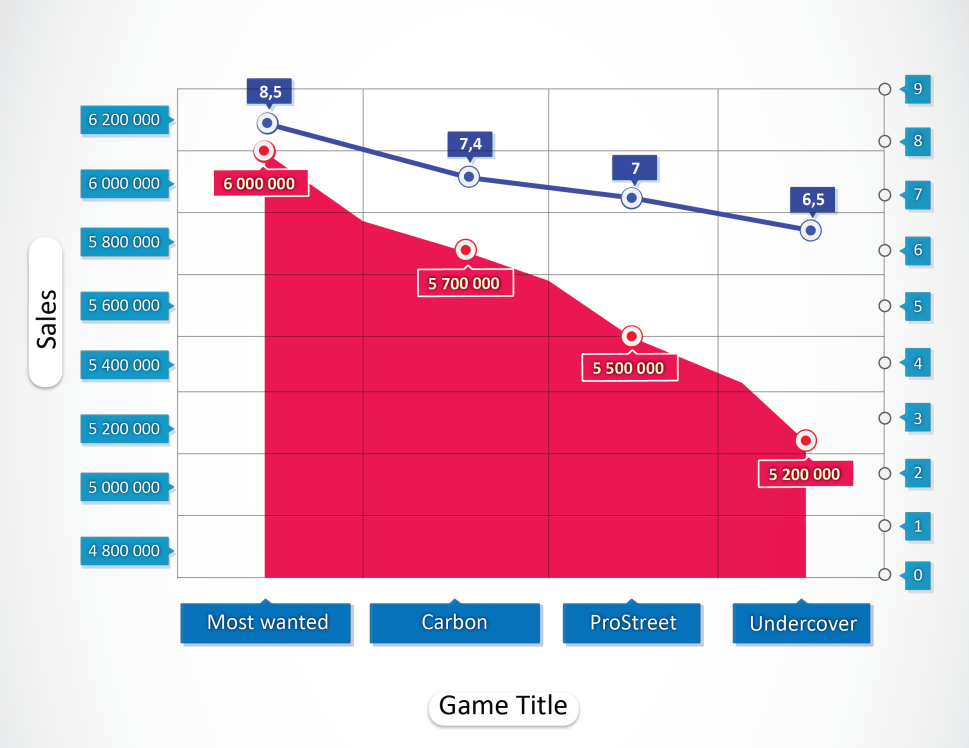
As highlighted by this case, the time interval between releases is an essential element concerning the creation of games. It is evident that similar games, in addition to belonging to the same product line, which continuously appears on the market, reduces variety and consumer choice, which, in turn, minimises customers' desire to purchase such games. However, at times, sequel release is, highly appealing to consumers. The release of the sequel of "Fallout 3" in 2009 may serve as an example, as it was a sequel to series of games of the late 1990s. A decade of anticipation merely heightened interest in this game. The outcome was that a significant volume of sales of this game, both for play stations and for computers, was registered (Sinclair, 2009).

It should also be noted that it is not only the time that has had a positive effect on the success of "Fallout 3". Certainly, over a decade the technologies of game development have undergone radical changes and capacities of platforms have made it possible to implement such gaming innovations of which users in the 1990s had never imagined. The implementation of innovations into sequels or games of the same genre has had an enormous impact upon the success of any game. Examples include "Need for Speed", a line of arcade games, which, since 1994, has been sold out in a number of 2.7 billion copies (Thorsen, 2009). When creating sequels to old games, such as "Need for Speed: Most Wanted"

(2005), “Need for Speed: Carbon” (2006), “Need for Speed: ProStreet” (2007) and “Need for Speed: Undercover” (2008), practically the same software backplanes were used with minor modifications. Consequently, as indicated in Figure 2.4 below, it can be noted that the use of sequel titles in gaming has had a positive impact upon sales.

However, it should be noted that the developers of the last parts of this game, for example, “Need for Speed: Shift” (2009) or “Need for Speed: Hot Pursuit” (2010), have resorted to new technologies of driving simulation, which has had a positive impact upon the opinions of both players and critics. According to “GameSpot” and data as of 1 February 2011, one of the ratings of “Hot Pursuit” was 8.5 of 10, and from the moment of market entry in December 2010, the volume of sales of this game was more than 5,000,000 copies (GameSpot, 2011). There could be other reasons for the success of “Hot Pursuit” sequel. The point is that “Need for Speed: Hot Pursuit” sequel is a remake of the namesake game released back in 1998. Moreover, similar to the already described example of “Fallout”, the time of anticipation heightened the interest of consumers in the “good old” game.

Figure 2.4 Dynamics of sales of games of “Need for Speed” series according to “GameSpot”



Source: compiled by the author on the basis of data available on GameSpot.com (2005-2017)

The fact is that gender has a direct influence on a consumer's choice of game genre (e.g. Cassell & Jenkins, 2000; Greenberg, Sherry, Lachlan, Lucas, & Holmstrom, 2008). Lucas (2004) has focused on social factors as well as was particularly interested in game preferences of players of different genders. As a result of his research, it may be claimed that women of any age play by far less than men. Among other researchers, Lucas (2004, p. 508) also assumes that women are not able to control characters in a game with 3D graphics properly, as games are arguably designed to capitalise on the strengths of male players. Women prefer to play quiet intellectual games and games directly related to social relations, family and sometimes to career, for example, games in the "Sim's" series (Lucas, 2004). In game advertising, a consideration of the target market's gender remains an important factor to be considered, since males and females continue to be drawn to different types of games. Thus, one can see that the gaming industry is a sound example of how product characteristics play a critical role in the firm's product policy.

2.5.2.2 Marketing communication

Advertising remains one of the leading marketing communication instruments for the dissemination of information about new products, inclusive of software products. Expenses for advertising constitute a significant share of budgets of large software corporations. A way to minimise the cost of advertising for an organisation is to acquire market information institutions, such as Marketline Business Information Centre, which offers information, including company news and as related to market segmentation (Feinberg, Kinnear, & Taylor, 2013). For example, in 2012 Microsoft Corporation became the leader in expenses for advertising, having spent $1.2 billion on advertising efforts (Forbes, 2012). Regardless of the amount of expenditure on advertising, targeted advertising remains a key to success, as advertising dollars spent on the wrong target market are wasted advertising dollars.

The majority of users do not believe in the promises of advertising, but at the same time, they view advertising to be useful for making the right decision on purchasing (Hoch & Ha, 1986; Hoch, 2002). The major challenge faced by consumers is that it is difficult for them to assess the quality of the provided advertising information about products mainly when such information refers to product experience which includes software (Abernethy & Butler, 1992; Mittal, 2002). Besides, previous research has also emphasised that consumers tend to make a higher assessment of those products whose advertising

contains a detailed description of characteristics and features of both types of the products (tangible or intangible).

On considering software, developers use various advertising instruments ranging from the placing of billboards in the streets of megapolises to the release of free-of-charge demo versions, so that users can test and assess all the advantages of one or another software product. For example, Microsoft Corporation has created dedicated websites for its products, where users can find out all the relevant information about the products offered and also leave their comments and opinions about the products which they viewed on the websites. Furthermore, distribution stores install consoles on their premises, thus enabling consumers to try, for example, any video game inside the retail store (Schilling, 2003).

By contrast to Schilling (2003), it is worth mentioning that Stahl and Maass (2006) have analysed real-time advertising information by examining consumers' mobile devices usage and their real-time product browsing on those devices. They find that often consumers will believe the commentary and reviews of fellow consumers before they will trust the advertising created by the companies themselves. Thus, it could conceivably be hypothesised that **advertising has a higher impact upon a product's revenue than its price (paid versus free software) (H1).**

2.5.2.3 Competition and network effects

As in the case of any other market, there seems to be a considerably intense competition in the software industry and particularly with respect to any category of software products. A series of characteristics of competitive products, such as dynamism, price hostility, non-price hostility and heterogeneity, make developers, mostly developers of chargeable software products, to do their utmost, so that their product is better than the product or market approach of the competitors (Zahra & Bogner, 2000).

Due to this tendency characterising market forces, the software market is shaped by external user networks effects, the most important of which is that the utility of any operating system, office package, or any other software product, is improved if a specific product has more users. In this sense, Katz and Shapiro (1985) have identified and illustrated three types of external networks effects (network externalities), namely:

- direct effect which manifests itself and indirectly influences the number of product users with respect to the consumer choice; such effect occurs, for example, in mobile communication networks when a user decides to terminate a contract for a group of subscribers on an overdue account;
- indirect effect which manifests its indirect influence on the number of users of the products complementary to the product in question on the consumer choice. This type of effect is illustrated, for example, by the computer hardware market, where a consumer decides on purchasing a computer with due account for the software compatible with such computer;
- post-sales service effect: for example, when purchasing cars, consumers take into consideration the quality and scope of the post-sale service network.

As Katz and Shapiro (1994) have shown, such external network effects have a severe impact upon the theory of market equilibrium, which is the general theory of economics that posits the interaction of supply and demand within the market will result in overall market equilibrium. Operating within a situation where network effects are absent, players within the software market compete in the context of learning-by-doing and by producing non-commercial products, become stronger commercially in the process of their products being used by consumers. The theory of competition within the context of learning-by-doing, or applied development through consumer feedback, as proposed by Spence (1981), thus mainly focuses on the impact of total production (total sales) upon price reduction.

Research of the network effect is rather widely represented in literature. For example, Brynjolfsson and Kemerer (1996) have studied the network effect of products aimed at handling spreadsheets. Software developers very often build a feature in their products which enables to save data in a specific format inherent only to this product. It makes other users purchase or download this software product for free, so that they can have the required information displayed, thus creating a network effect. An example would be Photoshop, a software programme intended for graphic design. It saves files in PSD format, and only files of this format save the document structure, which further enables any other user to proceed with modification of the graphic image.

So far, research conducted on consumer trends in regard to commercial and non-commercial software has primarily highlighted the issue of consumer choice as its subject: to buy or to make it oneself, the make-or-buy – review of such research is given, for example, in a study by Kuan (2001). On the contrary, Lee and Mendelson (2008) argue that the software market consists of two segments, that of free software

and paid software, each with different consumer preferences and although they are bifurcated into separate segments, they're also connected by positive network effects. One of the recent vital steps in studying competition within the software market was undertaken by Casadesus-Masanell and Ghemawat (2006), who combined the classical theory of duopoly with the learning-by-doing market and extended the case under consideration to a dynamic one, having presented a model of dynamic mixed duopoly. In the above study cases, consumer and user groups are viewed interchangeably. These studies suggest that network effects may be the key driver of revenue for some products as total usage, and thus demand for competitors' products in addition a a firm's own products, may drive revenue more than price. Based on the above analysis it can thus be suggested that **the level of competition between companies offering the same product has a higher impact a product's revenue than its (paid versus free software) (H2).**

2.5.2.4 Product brand and manufacturer brand

The trade name under which a particular product is marketed by the company which manufactures and distributes or both that product is commonly known as its brand name. When analysing consumer preferences within the software market, the question of whether the manufacturer brand has any influence on the success of a software product among consumers arises. Retail branding is generally viewed as inferior to manufacturer brands. By contrast, manufacture brands are considered visually attractive, while retail branding seems to be seen as boring and bland. As such, this implies that brand advertising is essential, as a considerable amount of funds are spent on marketing and advertising manufacture brands, rather than on the marketing of retail brands (e.g. Casadesus-Masanell & Ghemawat, 2006; Kuan, 2001; Lee & Mendelson, 2008).

The majority of contemporary organisations hold the opinion that a brand functions as an essential catalyst for business success. Several scholars (e.g. Bengtsson & Ostberg, 2006; Joachimsthaler & Aaker, 1997; Keller & Lehmann, 2006; Kotler & Keller, 2016) have been engaged in the studying of brands. Although research into brands can be conducted in various ways, the most common is the micro perspective which collects research data and information through in-depth interviewing of consumers (Bengtsson & Ostberg, 2006, p. 86). For instance, Joachimsthaler and Aaker (1997) employed the

method of continuous measure of brand equity as an approach of brand research that involves a continuous analysis of the impact of activities such as advertising a brand.

As Ahmed and Capretz (2007) have pointed out, brand strategy is also typical as applied to the software industry. A range of software brands, including Windows, AutoCAD and MATLAB, among other software, have successfully retained a large number of users, having captured the most substantial portion of specialised market segments. However, Ahmed and Capretz (2007) have noted that there is a difference between designing a family of software products and supporting the brand of the software developers. There could be a software product that is developed outside the scope of the brand family, but it could share the brand name, which is already recognised by users. A telling example would be the range of operating systems under the brand of Windows. Another example is provided by the Symbian brand, under which, a large number of products were released in the early 2000s, and which, according to Ahmed and Capretz (2007), can be installed on mobile devices of different globally-recognised manufacturers (e.g. Nokia, Sony Ericsson, Samsung).

If one considers the category of chargeable products, the situation is more or less clear, since a specific company is engaged in the development of this type of products. Even people who are far from the world of information technologies are aware of the world-class software developers, such as Microsoft or Apple. In the cases of proprietary software and freeware, the situation is much more complicated. As a result of the research conducted on this issue, Koch (2005) developed a hierarchy of designers and users of proprietary software and freeware. All of them form the so-called community in which everyone plays their own role: the project leader, managers, active designers, supporting designers, bug fixers, passive designers and ordinary users. Consequently, it is incredibly complicated for designers to build a recognisable brand, since there are so many competing and competitive brands on the market. Concerning proprietary software and freeware, there remains a possibility to build a brand of the product itself but not of its designers, since they work away as largely anonymous volunteers to support the evolution of the product (Koch, 2005).

It must also gauge the trust that consumers have with the venue in which they decide to place their orders. Analysing the role of trust in the case of business to consumer e-commerce, Kim and Peterson (2017) studied 16 pairwise relationships that were derived from the analysis of 150 studies involving online trust. A greater sense of online trust is shown to develop with antecedents such as perceived privacy and quality. A consumer's trust online is shown to bring with it consequences such as loyalty.

Further analyses showed that other characteristics such as the type of websites and study design affect the various online trust relationships which are developed. According to these analyses, the relationship between antecedents and online trust are complex and idiosyncratic (Kim & Peterson, 2017). Brands with a significant presence perform better in the measure of brand recognition. There was no interaction effect found, which implies that familiar and unfamiliar brands can attain equal benefit (Martí-Parreño, Bermejo-Berros, & Aldás-Manzano, 2017).

As consumers are offered greater opportunities to interact with an online shopping platform, they experience more satisfaction with the Internet buying experience. Included within this experience, consumers like to be shown and have as many attributes of the products they are preparing to purchase described to them. Valuable insights into the effects of interactivity and product information on consumers under the conditions of online retailing were provided by Ballantine (2005). Within the same study, it was shown that the amount of information related to any product has a significant impact upon consumer satisfaction. When given the choice, however, consumers showed a preference for increased website interaction over increased opportunity for information. A similar study demonstrated that there is a positive relationship between information contents (awareness) and consumer satisfaction on the Internet market. Similar to the in-store experience, consumers' satisfaction is increased when they feel well-informed regarding their purchases and feel a connection to the brand and the platform or store from which they are making their purchase.

Chung and Shin (2008) show that, among five main factors, namely, shopping convenience, product selection, informativeness, price, and customisation, it is specifically informativeness which has a positive impact upon consumer satisfaction under the conditions of online retailing compared to the other four factors. In support of this line of argument, it is essential to note that informativeness in particular, through online feedback systems, product descriptions, as well as reviews, ensures that products/services conform to consumers' taste and that consumers get products/services which match their needs. In that context, informativeness, particularly in the online retailing market environment would influence customer satisfaction more pertinently compared to other elements. In their research, (Chung & Shin, 2008) also recommended that online retailers should provide consumers with reliable and useful information about characteristics of their products. Notably, accurate information regarding a certain product/service reinforces consumer loyalty, since consumers can entrust their buying habits on a particular brand which has been adequately described. Therefore, the provision of accurate pricing information is part of informativeness, which further positively contributes to increased consumer

satisfaction. Marketers link brands to various other entities in highly competitive marketplaces. In order to understand this process, it is necessary to understand consumer brand knowledge and how it changes between various associations. Keller (2003a) suggests the adoption of a broader perspective by marketers to inform the multidimensionality of the knowledge of the brand as an essential step to strengthening branding theory in general, and particularly in case of brand leveraging.

Branding is considered as a main priority within a firm, which has made it compulsory for all members of the organisation to understand the basics of branding (Keller, 2003b). To strength, this goal, Keller (2003b) shows how various principles of brands along with brand equity and branding can be applied. Concepts regarding measuring, building, and management of brand equity are essential to building brand integration, positioning, growth, equity measurement, and management (Keller, 2003b; Keller & Lehmann, 2006).

These results provide further support for the hypothesis that **the brand has a higher impact upon a product's revenue than its price (paid versus free) (H3).**

2.5.2.5 Opinions of experts and users

The opinions of experts and users has been found to be a highly influential factor affecting consumer preferences. A study conducted by Duan, Gu and Whinston (2008) on the importance of online reviews, for instance, concluded that the opinions and views of other individuals on movies had no significant impact upon box office sales. However, the amount of posts had a significant impact upon box office sales, which indicated that the public had a higher awareness of the movie. Their research has shown that freeware (software which is free to download) for which expert reviews registered 90,000 downloads more than the products for which there are no expert opinions. The same situation has been noted in the case of other users' comments: software products with comments registered by 76,000 downloads more than software products without user comments. Moreover, Amblee and Bui (2007) have pointed out that expert reviews typically give rise to opinions of ordinary users. As such, user evaluations are almost identical to evaluations made by an expert concerning a specific software product. Reviews of experts and users accordingly help consumers to make appropriate decisions on purchasing. Moreover, satisfied users can serve as an advertising instrument, since they represent a source of new positive comments concerning specific software. Consequently, Amblee and Bui (2007) recommend that

distributors and developers should make the service of evaluation more accessible and more detailed, so that consumers can consider products from various perspectives.

Researchers (e.g. Chakravarty, Liu, & Mazumdar, 2010; Desai & Basuroy, 2005; Reinstein & Snyder, 2005) pay considerable attention to the issue of the influence of critics in the movie industry. A number of authors (e.g. Basuroy, Chatterjee, & Ravid, 2003; Debenedetti, 2006; Eliashberg & Shugan, 1997) have considered the role of experts and critics from both perspectives: as a means helping to predict consumers' expectations and also as an instrument for influencing consumer preferences. Thus, Basuroy et al. (2003) propose and advocate for a precise definition of the role of critics in cinema art and further report the difference between the influence of positive and negative reviews of the same movies as well as highlight the relationship between critical articles and how the engagement of movie stars or ensuring considerable funds to the movie budget may be influenced.

Similarly, in the software industry, critics' influence on sales is rather pervasive. This can be seen in the fact that a vast range of websites which are engaged in the distribution of software on the Internet give their expert evaluations and very often provide detailed reasoning for the provided evaluations. One of such websites is *downloads.cnet.com*, which provides a large collection of free and paid applications, games, and computer programs for both business and entertainment purposes. Sites such as *downloads.cnet.com* offer access not only to content, but also to client reviews, in addition to the opportunity for potential consumers to interact with the company and each other, thereby increasing user satisfaction by enhancing interaction within the platform itself (Desai & Basuroy, 2005; Zhu & Zhang, 2010).

Besides critics' opinions, the opinions of other users who have already perceived the weaknesses and strengths of a newly created programme have an impact upon consumers in the environment of the software market. As an illustration of this, Zhu and Zhang (2010) have found out that online user reviews have a significant impact upon the sales of software products. Besides, this type of reviews creates the greatest correlation effect concerning less popular products than popular products. Therefore, the authors argue that by implementing the same marketing strategy, companies cannot achieve the same success for all types of products in terms of their characteristics and quality. Nevertheless, Zhu and Zhang (2010) advocate that spectators' reviews are a predicting factor to a greater extent than the factor which has an impact upon sales and in the present society, mainly due to the rapidly growing influence of the Internet upon users. Online reviews of consumers with respect to any product are one of the most

important sources of information for other consumers. As such, product reviews are increasingly playing an important role in consumer choice. According to comScore, a company engaged in research of the Internet environment, 24% of users of the Global Network read online reviews before purchasing any product (Zhu & Zhang, 2010, p. 1). Dellarocas (2003) pointed out that many firms generally consider online consumer reviews as a new marketing tool. In addition, they have emphasised that distribution companies engaged in the distribution of software via the Internet should pay more attention to users' reviews. Thus, typical course of action or practice may entail additional expenses for monitoring the proprietary websites of companies which are engaged in the selling of software so as to avoid a large number of negative reviews concerning the products being sold.

The issue of the influence of reviews by spectators on box office receipts of movies is examined by Liu (2006). The author highlights that reviewing activity from spectators is much higher during pre-release and the first post-release weeks. Moreover, spectators' opinions have a predicting influence both upon box office receipts during the first weeks and upon total box office records. It is remarkable that it is the number of spectators' reviews rather than their contents that is the determining factor. The audience is therefore oriented towards the fact that the movie is widely discussed even when reviews are negative. Evidently, this means that external influencers such as spectator opinions have a direct impact upon the success of a good or a service (Liu, 2006). The influence of the dynamics of spectator opinions on the dynamics of sales was further examined in a study carried out by another group of researchers under the leadership of Duan et al. (2008). Their findings suggest that there is a definite relationship between spectators' opinion and the volume of sales. Moreover, they also argue that it is the number of spectators' reviews rather than evaluation opinion that is the determining factor.

Experts' influence and user evaluations concerning various types of products are examined alongside the reviews provided by websites (e.g. Ginkeo & Okina, 2001; Kowatsch, Maass, & Fleisch, 2009; Stahl & Maass, 2006). The results of the research have demonstrated that customers actively use reviews of digital products to be purchased which they obtain on their mobile devices when purchasing in-store, predominantly when these types of reviews are provided free-of-charge and are typically related to the use of domestic electronic equipment. It has been shown that, "consumers are willing to pay 2.9 percent of the product's price for a corresponding review" (Kowatsch et al., 2009). The reviews themselves are provided for free, however the cost of providing them is built into the increased price of the product. This is also applicable to all the types of products, ranging from digital cameras to food-related items. However, in the case of digital products, free-of-charge reviews are used and accepted by

customers to a greater extent. It follows that the type of product has a significant influence on the degree of acceptance of any customer's review of the product. From the point of view of management, the research performed by Kowatsch et al. (2009) supports the fact that such a reviewed product may appear on the market of digital products. In addition, a review is typically obtained in either of the two ways: by making a separate payment for it or ensuring its price at 1.94-4.45% of the price of the parent product (Kowatsch et al., 2009). One of the instruments of distribution of this type of product may include dedicated software which can provide the possibility to read special code characters on digital products and these code characters contain the contents of reviews. Moreover, it is recommended that stores should expand and enhance the wireless networks for access to the Internet inside the stores for attracting new customers. Providing free Internet to customers will also effectively contribute to ensuring an excellent competitive advantage (Kowatsch et al., 2009). Thus, the following hypotheses are suggested:

Opinions of critics have a higher impact upon a product's revenue than its price (paid versus free) (H4).

Opinions of users have a higher impact upon a product's revenue than its price (paid versus free) (H5).

2.6 Conclusion of the chapter

This chapter has presented a review of researches on the issue of development of the contemporary social and economic relations resulting from the availability of omnipresent information and communication technologies, including Internet-based technologies. Various approaches to the description of the arrangement of contemporary society have been studied. However, the present doctoral research study has adopted the definition of contemporary trends in the development of society as *information society* to be understood as a social and economic system in which products of immaterial labour (e.g. information, knowledge and information services) are the central objectives of economic activity, information technologies are the main drive, and network is the main form of institutional organisation. Additionally, an analysis of approaches to the description of economic relations in the era of information society has been carried out. It is believed that contemporary economic relations characteristically develop within the framework of *information economy* – the economy in which

information or information products, knowledge, and services are the main objects of economic relations and economic exchange takes place through global computer networks.

In this chapter, the three dimensions of the Internet space are distinguished: public, social and market dimensions. The main notions of the market sector of the Internet space are specified in terms of two approaches, namely, the marketing and institutional approaches. Furthermore, as a result of this research, the main categories of the institutional theory in the context of the development of the economy of the virtual environment have been defined: institution, transaction and transaction costs.

The economic institution of the Internet environment is a set of acknowledged norms of interaction among agents in the virtual environment. Transaction on the Internet, as it has been pointed out in the sections above, shall be understood to mean a form of economic relations between a firm and the parties to the trade in the surrounding institutional environment which come with alienation or transfer of rights, liberty, and property by means of information and communication technologies. Transaction costs in the Internet environment shall be interpreted to mean the costs that occur in the process of carrying out of online transactions and incorporate expenses for obtaining information and protection rights of online economic agents.

An analysis of the main concepts of marketing constructed within the scope of the marketing approach has been provided. With consideration given to additional approaches to studying the marketing mix, an overview of the 4Ps marketing mix model for the virtual market has been provided. Essential terms have been defined, such as market, virtual market, and Internet market, accompanied by a concise classification of markets. A specific focus was paid to certain elements of the marketing mix, in connection with future recommendations for research. For instance, future research around the subject of a product should focus on the attempt to evaluate product policy employed by participants within the Internet market. Several definitions of information products have also been presented, suggesting that information products that's value is attributable to the data or information which they hold and which functions as a product in the market, whether the product itself is tangible or intangible. Products available on the Internet are products whose design, development, promotion and supply are undertaken and enhanced via the Internet. Therefore, the notions of information products and products available on the Internet are not identical.

Additionally, in an attempt to strengthen the existing ideas about competition in the virtual environment, a selection of the main factors of non-price competition on the Internet have been provided. To be or remain successful, organisations have to consider factors such as non-price competition and information products, even though the virtual environment offers numerous potentially profitable opportunities.

Based on the synergy of the institutional and marketing approaches, the following chapter will proceed with an analysis of economic relations in the virtual environment more deeply and constructively.

CHAPTER 3. A THEORETICAL ASSESSMENT OF PRODUCT POLICY OF E-COMMERCE COMPANIES

The chapter three describes the typology of the costs of the transaction within a virtual environment, which has been indicated to augment theoretical attitudes to the descriptors of the interface amongst e-commerce subjects, or what theory describes as should happen or how the transactions should occur. The novelty, scientifically, in the creation of a typology around transaction costs for the virtual environment can be observed in the development of a contemporary model of interactions based upon transactions between economic agents acting underneath the conditions of an Internet market. The increment of knowledge, therefore, includes the development of a model for transactions which considers the specifics surrounding virtual economic transactions. The academic significance of the creation of transaction cost typology within a virtual environment contributes to expanding the knowledge surrounding processes of transaction underneath the conditions of an Internet market. Practically, the implications for the development of transaction cost typology within a virtual environment suggest recognition of a basis in methodology for the examination of interactions based upon transactions between economic agents acting underneath the conditions of an Internet market.

The optimal condition is defined for implementing product policy by e-commerce firms by analysing e-commerce firms' product portfolios, based upon informativity of products for sale. Practically, the model refers to the potential for commercial bodies functioning by the conditions of the virtual market to evaluate the effectiveness and efficiency of their operations.

In the section that follow, economic institutions are classified within the context of the Internet market, along with an evaluation of the transaction costs associated with e-commerce companies.

3.1 Classification of economic institutions within the Internet market and transaction costs of e-commerce companies

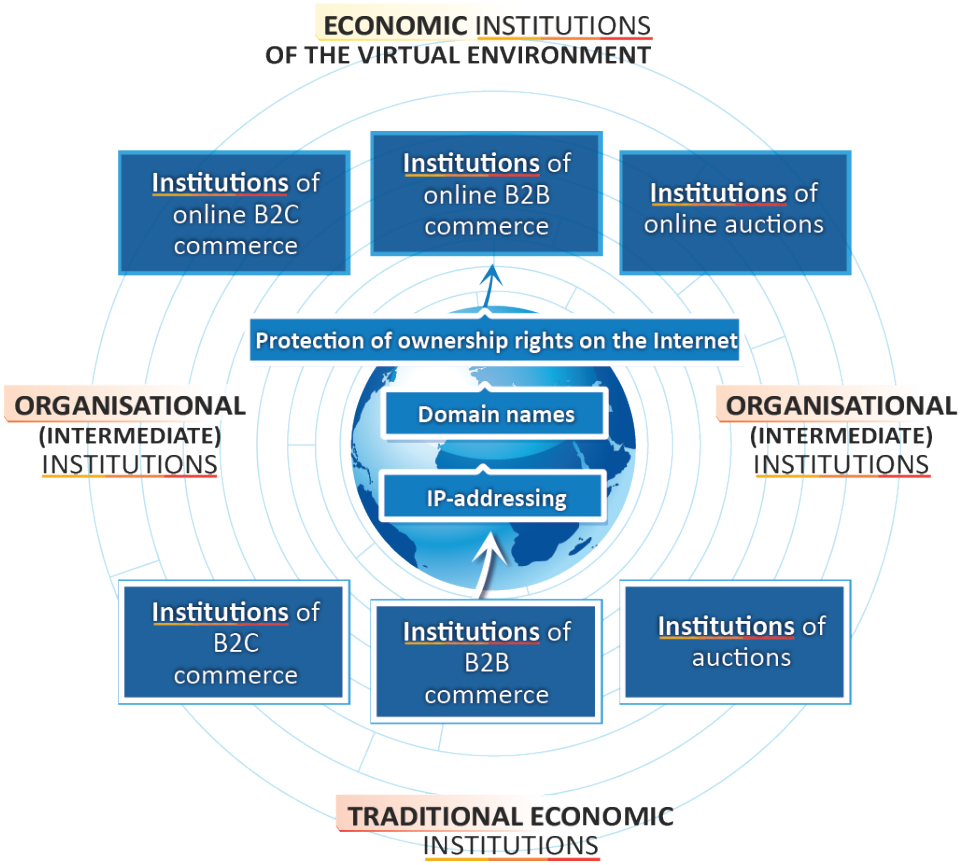
In the practice of academia, a sizeable portion of research has demonstrated that transaction costs can be reduced through the leveraging of IT resources. Contemporary studies address this topic, concluding that it is closely related to the optimisation and overall progression of business process. The means of impacting economic agents' transaction interactions within the Online environment remains to be dealt with. The total costs of all of the elements of transaction must be understood, along with distinguishing the various types of transaction costs. The rise in prominence of e-commerce and the Internet have changes companies' approach to business, as well as consumers' purchasing habits.

3.1.1 Marketing institutions in the system of institutions of e-commerce market

The rise of the Internet and with-it e-commerce has drastically changed consumers' shopping habits and business in general. Consumers, firms, governments, and indeed anybody can now connect with anyone in the world electronically from the comfort of their own home (Weisstein, 2017). With the growing importance of e-commerce also comes the necessity to identify how marketing functions in this space. Marketing in the e-commerce market has grown to be based on the principle of isomorphism. In turn, this implies that all organisations are structured or operate in a manner similar to other organisations, either through imitation or due to similar constraints (Weisstein, 2017). Based on this principle of isomorphism, Internet Engineering Task Force (1980) shows how traditional institutions flow into economic intuitions in the e-commerce niche, as shown in Figure 3.1.

To gain a better understanding of all these institutions, a series of institutions related to all technological aspects of organisational institutions will be first explored (Internet Engineering Task Force, 1980). Firstly, it is worth considering institutions as related to various technical aspects, and accordingly, as institutions of IP-addressing (i.e. where an IP address is a unique network address of a node of a computer network based on the IP protocol and institutions of the domain).

Figure 3.1 Isomorphism of the Internet space



Source: compiled by the author based on Internet Engineering Task Force (1980), Brousseau (2004), Flanagan and Maniatis (2008), Mueller (2010), Weisstein (2017), Hulten (2017)

Institutions of IP-addressing. Irrespective of its location, each computer in use has a unique network address, called an IP-address, which essentially allows anybody with that information to track down the said person. Think of it as a computer's social security number. There are several institutions out there in charge of regulating all aspects of IP-addresses, including any issues which may arise. To resolve those, even at the moment, specialised institutions are being created, whose main aim is to deal with a number of economic topics, such as external factors, shared resources, cost distribution and shortages. For example, given how quickly technology is growing, both common users and business users may be facing a shortage of IP-addresses.

The Internet Protocol is a system which takes segments of one network and puts them into one single network, which, in turn, enables users to deliver data much more efficiently and quickly through a

circuit of network nodes. In turn, this results in the creation of an address space: a virtual realm of finite proportions similar to the way in which radio waves may be viewed in terms of their frequencies. Whereas it cannot necessarily be seen, this space is genuine, while its size depends on a series of technical standards set by the Internet Protocol.

Institutions of domain names. Domain names also play a significant role in the virtual world of business. Just as branding is essential in the real world, domain names are equally crucial for e-commerce. Domain names are, therefore, another means for companies to present themselves to the consumer, which may and has naturally caused certain conflicts. For instance, organisations which registered and assigned domain names to large companies versus those which promote intellectual property and inherently support businesses in terms of their brands could never see eye to eye how domain names should be handled. This may be explained by the fact that the organisations which promote intellectual property rights (e.g. law firms) would prefer domain names be a part of a company's trademark rights as opposed to them being viewed as a separate entity (e.g. Golinveaux, 1999; Johnson, 2001).

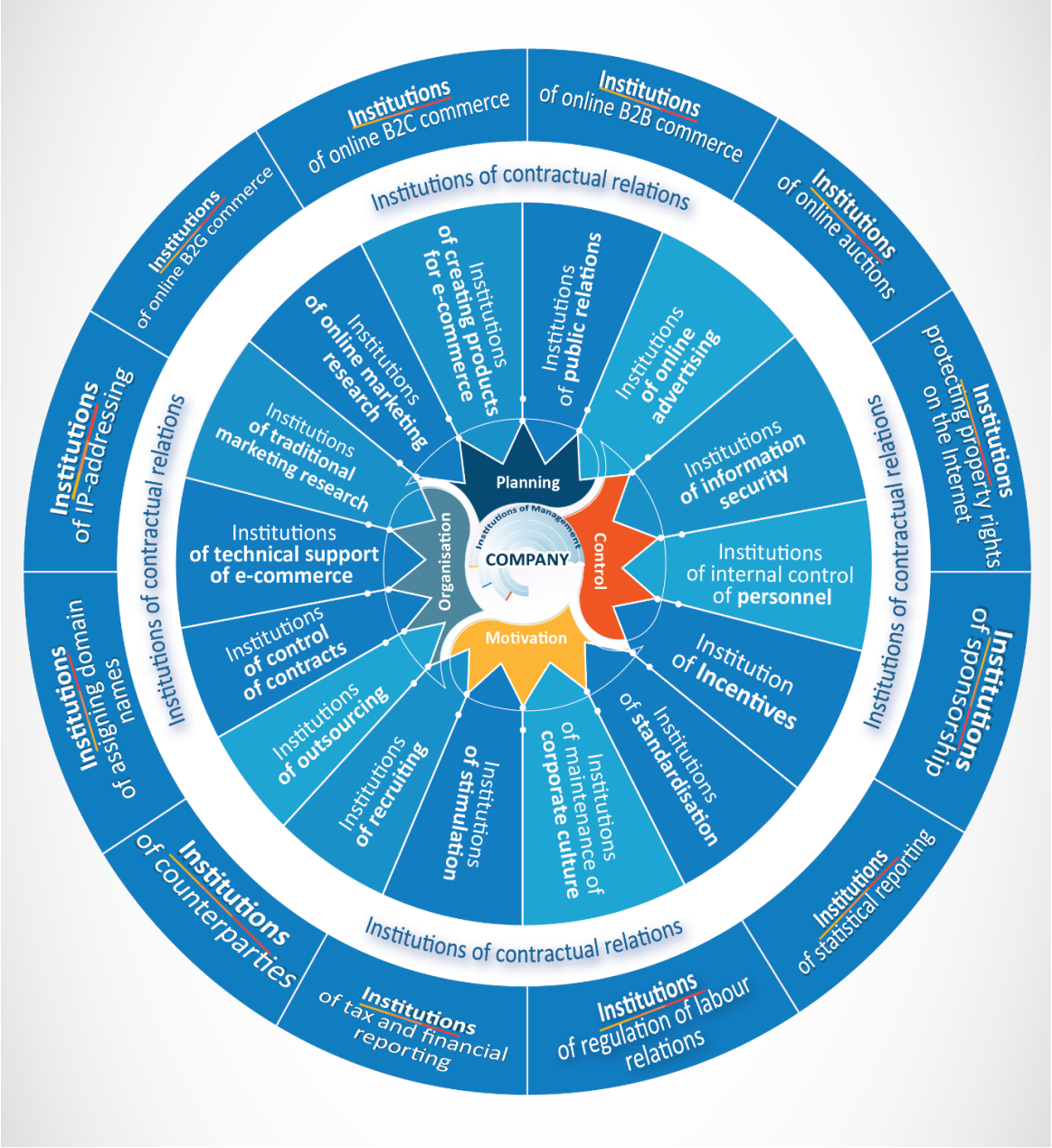
Institutions of protection of property rights on the Internet. Researchers of economic, legal and social areas have all highlighted and discussed issues related to the protection of property rights on the Internet (e.g. Flanagan & Maniatis, 2008; Mansell & Steinmueller, 1998). To understand their viewpoints and a series of pertinent arguments, it is important to both understand and distinguish between intuitions of protection or property rights available, as discussed below.

As emphasised by Brousseau (2004), digital technologies allow the implementation of more decentralised systems as compared to that of traditional set-up. From a business standpoint, this system can be viewed as the system which has always been required. This system leaves room for the probability of public products being seized, due to both potential conflict and the disappearance of protection authorities, thus leading to a monopoly. This system monitors the behaviour of all the parties involved in preventing any seizure of public products from occurring, serves to resolve conflicts and to ensure that every part receives the necessary legal support regarding these exclusive rights (Hulten, 2017).

From the standpoint of institutional theory, a company engaged in Internet-based business operates within an institutional environment. Similarly, to traditional commerce, the customer cannot just tell the difference between an exogenous institutional environment – a complex of institutions which have an

impact upon the company from the outside, and an endogenous institutional environment – a complex of institutions which have an impact upon the firm from the inside. Part of the institutions is inherited from the traditional business, while the other part is new for the era of informational capitalism, where, in contemporary society, information and knowledge is valuable and worthwhile and business compete for it as a commodity. The model, as illustrated in Figure 3.2, mainly considers formal institutions, namely, the institutions established in compliance with political, legal and economic rules and regulations. A subsequent focus on the formal institutions is motivated by their nature as a means to coordinate transactions within the context of impersonal relationships. This difference of formal institutions from informal ones is particularly important when it comes to e-commerce business largely because, in this case, processes of searching for products and their promotion on the part of buyers and sellers, respectively, involve personal contacts to a much lesser extent compared to standard forms of shopping and promotion. These institutions are summarised in Figure 3.2. below.

Figure 3.2 Institutional environment of Internet-based companies



Source: compiled by the author based on Chen and Dubinsky (2003), Li and Leckenby (2004), Faber, Lee and Nan (2004), Tutaj and van Reijmersdal (2012), Halvorson and Rach (2012), Nam and Pardo (2011)

Following the classification illustrated in the above, Table 3.1 contains the typology of institutions of the Internet. The classification is based on the typology of institutions of information search, which may serve as an example of the systematisation of institutions of the virtual environment by giving those in the virtual market a good idea of where their brand stands as compared to others.

Table 3.1 Typology of institutions within the Internet environment

Institutions	Functions	Economic Environment
Institutions of External Regulation, Control, and Statistics		
Institutions protecting property rights on the Internet	Protection of property rights to information products of firms operating in the virtual environment	Virtual
Institutions of tax and financial reporting	Ensuring governmental control of economic agents' activity	Traditional, virtual
Institutions of statistical reporting	Creation of state statistics	Traditional, virtual
Institutions of regulation of labour relations	Ensuring governmental control of compliance with labour relations in the firm	Traditional, virtual
Institutions of contractual relations	Contract formation	Traditional, virtual
Institutions of Business-to-Business Communication		
Institutions of IP-addressing	Providing economic agents with a pool of IP-addresses	Virtual
Institutions of assigning domain names	Providing economic agents with a subsequently recognisable Internet name	Virtual

Table 3.1 (Continued)

Institutions	Functions	Economic Environment
Institutions of counterparties	Providing firms with the required initial resources	Traditional, virtual
Institutions of sponsorship	Ensuring sponsor support of firms from the outside	Traditional, virtual
Institutions of Business-to-Customer Communication		
Institutions of online B2C commerce	Carrying out primary business activities within the retail e-market	Virtual
Institutions of online B2B commerce	Carrying out primary business activities within the retail-wholesale e-market and the wholesale e-market	Virtual
Institutions of online B2G commerce	Carrying out the primary business activity among Internet-based companies and government structures	Virtual
Institutions of online auctions	Carrying out the primary business activity on the basis of the auction model	Virtual
Institutions of Internal Control of Internet-Based Firms		
Institutions of information security	Preventing information leakage within the company	Traditional, virtual
Institutions of internal control of personnel	Personnel issues, ensuring the storage of commercially-sensitive information	Traditional, virtual
Institutions of Internal Management of Activity Internet-Based Firms		
Institutions of technical support of e-commerce	Ensuring the efficiency of the e-commerce platform	Virtual

Table 3.1 (Continued)

Institutions	Functions	Economic Environment
Institutions of control of contracts	Ensuring optimal conditions for performing contracts	Traditional, virtual
Institutions of outsourcing	Delegation of the firm's various functions to other counterparties	Traditional, virtual
Institutions of Marketing of Internet-Based Firms		
Institutions of creating products for e-commerce	Creation of products which can be in demand on the Internet market	Virtual
Institutions of online marketing research	Carrying out research on the virtual market	Virtual
Institutions of traditional marketing research	Carrying out research on the traditional market	Traditional
Institutions of online advertising	Creation of a specific firm's reputation by communicating information about its activity, and by using the Internet	Virtual
Institutions of public relations	Creation of a specific firm's reputation by communicating information about its activity, and by using traditional techniques	Traditional
Institutions of Labour Relations of Internet-Based Firms		
Institutions of recruiting	Selection of appropriate personnel	Traditional, virtual
Institutions of standardisation	Defining rules regulating the work of the personnel	Traditional, virtual
Institutions of stimulation	Motivation of personnel to work more efficiently	Traditional, virtual

Table 3.1 (Continued)

Institutions	Functions	Economic Environment
Institutions of maintenance of corporate culture	Establishment of the system of corporate values, mission and philosophy	Traditional, virtual
Institutions of incentives	Motivate to pursue particular preferences	Traditional, virtual

Source: compiled by the author based on Chen and Dubinsky (2003), Li and Leckenby (2004), Faber et al. (2004), Tutaj and van Reijmersdal (2012), Halvorson and Rach (2012), Nam and Pardo (2011)

Although such an overview could be broken down into many sub-institutions, there are a few major marketing intuitions for Internet-based companies. For the purposes of this research, in the following, Institutions of online marketing research, Institutions of the creation of products for e-commerce, Institutions of public relations and Institutions of online advertising will be briefly discussed.

1. ***Institutions of online marketing research*** help economists and businesses by researching the virtual market and highlighting any patterns or discrepancies noticed between the needs and values of potential customers, so that companies in the industry may act accordingly. To this end, online market research can be conducted traditionally and virtually through questionnaires, surveys, focus groups or through new techniques, such as web analytics (Web Analytics Association, 2008).
2. ***Institutions of the creation of products for e-commerce*** create new, in-demand products which the virtual market seems to desperately need. These products, once they are made, could fall into one of three categories: ideal Internet products (products that sell well Online, such as books), Internet products which increase demand (limited edition, or Internet-sale only products, such as an on-trend shade of lipstic which is only available for a limited time Online), and Internet products which stifle demand (products which are difficult for a consumer to confidently purchase online, such as clothing). These categories enable producers to gauge how successful their products will be in the virtual market (e.g. Brynjolfsson & Smith, 2000; Chen & Dubinsky, 2003).
3. ***Institutions of public relations***. The job of public relations institutions is to both create and maintain the positive reputation of their business or company by communicating information

regarding its activities. The main function of such institutions is to create a specific reputation of a firm by communicating information about its activity. This is done through several different marketing tactics, including search engine optimisation, e-mails, and social media (Halvorson & Rach, 2012). The Internet is a great outlet to advertise and self-promote, mainly due to how cost-friendly it is to do so. It does not take an enormous budget or any budget at all to send out emails, create social media posts, as opposed to the cost involved in the cases of a commercial or a billboard. All of these factors have the same effect as physical means on developing a firm's specific brand image or products.

4. ***Institutions of online advertising***. Similar to traditional business, the main function of such institutions is to communicate information about products or services to consumers. The Internet has drastically changed advertising by offering multiple platforms, such as social media, where firms can reach a global audience in an efficient and cost-effective manner. Early advertising, particularly in the 1990s, was through electronic mailing lists (Li & Leckenby, 2004). Modern Internet advertising methods include various means, from banner ads, pop-ups, and interstitials, to sophisticated interactive, 3D visualisations and advergames (Faber et al., 2004). The most recent Internet advertising means have been typically varying from subtle to more prominent advertising formats (Tutaj & van Reijmersdal, 2012), such as media (banner), contextual, search, location-based and product-placement advertising. However, it is complicated to evaluate the effectiveness of the use of advertising instruments, since advertising is directly related to the allocated budget, and, in the case of the majority of companies, any information about it is generally restricted or typically held as a commercial secret (Tutaj & van Reijmersdal, 2012).

The use of these various types of Internet institutions in a virtual market has come to fruition thanks to the principle of institutional isomorphism. The vast majority of institutions, which still swear by the traditional method of commerce, have quickly realised that the virtual market is growing and that it is time to match their competitors. In the opinion of many authors, including Nambisan (2002) and Nam and Pardo (2011), the development of companies within of the virtual environment is related to the concept of institutional isomorphism. Despite this, many authors (e.g. DiMaggio & Powell, 1983; Fuller, Hardin, & Scott, 2007; Yoon & George, 2013) argue that business in the virtual world still follows the same basic structures, supporting the idea that they fall under the concept of institutional isomorphism. As also noted in these research studies, several institutions of traditional commerce are reflected in institutions of the online economic environment. As such, institutions which are exclusively characteristic

of the virtual environment can be distinguished. Examples of the latter type of institutions would be institutions of IP-addressing and institutions of assigning domain names. To this end, the typology of transaction costs characterising the Internet market will be explored in the subsection below.

3.1.2 Typology of transaction costs of e-commerce companies

In academic practice, it can be seen that quite a lot of research (e.g. Kovaleva, 2014; McNaughton, 1997; Ruey, 2008) has proved that information technology is capable of reducing transaction costs. In recent years, several scholarly studies have dealt with this issue and pointed out that it is particularly related to the implementation of information services inside the firm with the main purposes of optimising the progress of business processes. However, how the Internet environment impacts upon transaction interactions of economic agents inside the environment still needs to be addressed. This is why, it is first necessary to understand what total transaction costs are comprised of and also to distinguish among different types.

Based on behavioural assumptions in their relation to features of a transaction, Williamson (1979; 1981)developed his vision of an economy of transaction costs. The behavioural assumptions include bounded rationality and opportunism. The former assumptions suggest that human beings are constrained in their capacity to collect and process information as they are restricted by their metal capacity, or the limited time they have to make decisions. These factors also indicate that there typically exists a good deal of uncertainty as related to factors which influence the result of one's current activity. A person is ignorant of both other people's future and actual intentions and actions. Opportunism is reflected in cheating and concealing information from a business partner which concerns relevant aspects of a transaction in which they are involved. It is evident that the second behavioural assumption follows from the first one, as it is only an ignorant person who can be misled. The risk of being deceived by a business partner also depends on a transaction which relates them to each other. By taking these considerations of possible shortcomings of business communication into account, it is essential to note that Williamson (1979; 1981) distinguishes three main features of transactions: asset specificity, uncertainty and frequency:

- *Asset specificity* is a term related to long-term investments which are made in support of particular transactions; the opportunity costs of such investments are substantially lower in

the best alternative use or use by other users. In other words, such assets cannot be utilised for alternative purposes without registering a significant loss of their value.

- *Uncertainty* is related to unforeseeable circumstances in the future which are relevant for a transaction's outcome and distribution of its benefits among the partner. As these circumstances are unknown beforehand, they cannot be mentioned in the contract, which creates the room for its arbitrary interpretation of the partner in their favour.
- *Frequency* is related to the frequency with which transactions recur. According to Williamson (1998, pp. 72–84), the higher transaction frequency, the more long-term are the relationships between the partners. As a result, the coordination of long-term relationships rather depends on the future and, in turn, also on unforeseeable circumstances. Thus, the significance of transaction frequency remains closely related to the uncertainty.

All three represent principles of organisational design, and although transaction cost reasoning functions in support of the three principles, it is only the principle of asset specificity which is tightly linked to dimensionalising. Both behavioural assumptions of bounded rationality and opportunism thus function in respect to all three principles. Therefore, the studies published by Williamson (1979; 1981) provide a much-needed insight on the economisation of transaction costs, an area of study which has previously been less well developed. It is suggested that the economisation of transaction costs thus goes hand in hand with the economisation on production expense, an area which regrettably has not been emphasised by the study conducted by Williamson (1979) as its main focus was relating transaction costs to governance structures. While transaction costs and production expense seem to be the same, or at least very similar things, they both describe the costs of doing business that a firm incurs. However, production expense is incurred during the production of a good and transaction cost is incurred by the firm upon its sale. Firms are this better able to minimize transaction costs because of the virtual market.

Based on the above, it is claimed that the combination of the behavioural prerequisites and the features of transactions determines the level and types of transaction costs. Transaction frequency makes users subject to the future, while uncertainty does not allow them to foresee them up front, which consequently makes contracts incomplete. However, due to the amount of variability within contracts, they are often unenforceable. At the same time, transaction-specific investments make users continue business with the same partners. In other words, any of these five aspects is indispensable for making transaction-related relationships highly problematic.

Teo, Wang and Leong (2004) tried to explain the transaction cost economics from the consumers' point of view by demonstrating the relationship between consumers' willingness to make an online purchase and the presences of transaction costs. In addition, it has also been attempted to expand the point of view of Williamson (1979; 1981) and proposed their own perspective on the components of transaction costs, by suggesting a model which assumes that online customers incur transaction costs of two types:

1. Costs for the search of information incited by customers when searching for information about products and stores;
2. Costs incited by customers when monitoring the observance of the rights and obligations of the parties under the transaction (Teo et al., 2004).

Compared to Williamson (1979; 1981), the essential contribution of Teo et al. (2004) may be reduced to the concept of transaction costs incurred by customers rather than those incurred by companies. More importantly, Teo et al. (2004) distinguish six sources of transaction costs, namely: product uncertainty, behavioural uncertainty, convenience, economic utility, dependability, and asset specificity. Sources are defined below:

- *Product uncertainty* is related to the difficulty in determining the quality of the product to be purchased. In the case of a traditional sale, customers can touch the product, examine it, or even smell it. Conversely, in the case of online purchasing, consumers can rely solely on the description of the quality of the products provided by online sellers. In turn, this makes online customers more subject to the way in which sellers present their products, which is why it is suggested that online buyers should incur higher costs so that they protect their rights against potential cheating on the part of sellers (i.e. cost of returning merchandise).
- *Behavioural uncertainty* is related to inherent difficulties which are experienced by customers when assessing the performance of online sellers on a contractual basis. This uncertainty makes customers vulnerable to opportunism on the part of sellers, which further makes them incur additional costs to protect themselves.
- *Convenience* is the advantage related to saving free time as well as to efforts made by customers when making online purchases. Customers can make purchases whenever they have spare time, and they aim to spend fewer efforts on searching information. Evidently, this aspect saves them correlated transaction costs.

- *Economic utility* refers to the fact that online sellers provide their customers with an opportunity to compare prices for competitive. Again, in this case, customers avoid the necessity to physically visit various shops to collect information about products and prices, which renders subsequent transaction costs much lower.
- *Dependability* is related to the ability of the seller to provide customers with the outcomes which have been promised when making the transaction, namely, the product of an appropriate quality and after-sales. This aspect is inherently related to behavioural and product uncertainty, which, in turn, makes it a factor of transaction costs.
- *Asset specifity.* The study by Teo et al. (2004) identifies two types of asset specificity: physical asset specificity and human asset specificity, as they argue that it is these types which are relevant when it comes to online shopping. While the former is generally associated with investments in special equipment, such as personal computers and network equipment for the promotion of online commerce, the latter component specifically refers to investment in both time and effort for obtaining sufficient experience in online sales. However, despite the fact that the majority of online shops develop a convenient and user-friendly interface, consumers still spend a considerable amount of time in learning the process of purchasing on the Internet, which makes these types of transaction costs higher. The results of the research by Teo et al. (2004) also demonstrate that behavioural uncertainty and asset specificity have a positive effect on transaction costs, whereas convenience and economic utility establish negative transaction costs.

When defining *asset specificity (as described earlier in section 3.1.2)*, the present research study adheres to the definition provided by Williamson and Riordan (1985), mainly because it is the first and one of the accurate definitions which has subsequently become ground-breaking for other scholars. It is also a detailed definition which covers all relevant aspects:

> *Transaction cost economics* maintains that the principal factor that is responsible for transaction cost differences among transactions is variations in asset specificity. Transactions that are supported by non-specific (redeployable) investments are ones for which neoclassical analysis is well-suited to deal. As a condition of asset specificity becomes more important, however, exchange relations take on a progressively stronger bilateral trading character. The reason is that parties to such trades have a stake in preserving the continuity of the relationship. Simultaneously, however, problems of adapting bilateral contracts to changing circumstances

> predictably arise. Autonomous market contracting is thus supplanted by more complex forms of governance as asset specificity deepens. New forms of despite settlement (such as arbitration) may be created. Some transactions may be removed from the market and organised internally instead. The heuristic model gives content to this firm or market (make or buy) orientation. (1985, p. 367)

Similarly to companies, customers are ignorant of numerous important aspects of transactions which they are involved in and also face the issue of sellers' potential opportunism. In turn, the importance of these aspects depends on a number of uncertainties, coupled with transaction-specific investment on their part. This view is supported by Liang and Huang (1998) who investigated levels of customer acceptance with regards to electronic commerce of products with significantly different characteristics. The study aims to evaluate if the transaction costs model can be used to validly explain consumer choices between both traditional and electronic channels. It is further suggested that the finding reveal that books and flowers, as opposed to toothpaste, microwave ovens and toothpaste, for example, typically more consumer orders as far as e-commerce is concerned. Liang and Huang (1998) have been the first to advance a theoretical model which is based on the transaction cost economics. The purpose of their model is to understand which products can be more successful in the virtual environment (Liang & Huang, 1998). Consumers will be attracted by the channel which presents the lowest transaction costs. In other words, whether consumers purchase any products on the Internet is determined by the transaction costs of the distribution channel. Thus, transaction costs in the virtual environment are determined by the level of uncertainty and specificity of availability of products or services. In support of this argument, five categories of products with distinct characteristics were tested, namely, books, footwear, toothpaste, microwave ovens and flowers, which involve 86 active Internet users. However, when purchasing in online shops, a series of factors which may have an impact upon consumers' decision-making process would also need to be considered. In economic terms, of particular interest are factors which are relevant only to the virtual environment and do not influence the making of purchases in traditional stores. Moreover, these factors, and even more so than others, are related to the transaction process subsequently influencing transaction costs. Consequently, an electronic purchase of a product is claimed to be less likely to be opted for when there are higher perceived costs in comparison to purchasing via traditional channels of distribution.

An effective understanding of these factors depends on the way in which the decision making on the part of customer is displayed. As pointed out by Blackwell, Miniard and Engel (2006), a conventional

model distinguishes five stages: problem recognition, search, evaluation of the opportunity costs, selection and outcome (the fact of purchase). Known as the customer resource life cycle (CRLC), another model divides interrelations between companies and their customers into four main stages: requirement, acquisition, stewardship, and retirement (Ives & Learmonth, 1984). The third model, widely known as the mercantile model, decomposes the process of decision making into three main stages: purchase determination, purchase consumption and post-purchase interaction (Kalakota & Whinston, 1996). Taken together, these models highlight a similar process of customer-seller interaction. Pre-purchase and post-purchase behaviour are evident in all models, with transaction cost being the determining factor in regard to whether the consumer does indeed make a purchase. Furthermore, the models provide a much-needed insight into the sometimes-complicated consumer buying-decision process and are of value to sellers who are then able to better understand factors of consideration for consumers, which essentially indicates that these consumer models can respond better to consumer demands and preferences. A significant difference between the models is noted in their emphasis where, for instance, the CRLC model places more emphasis on post-choice activities, yet the mercantile model exhibits a more balanced approach.

In order to show that transaction cost is the foundation upon which customers conduct transactions, Liang and Huang (1998) have proposed using the model which describes the transaction process consisting of seven stages:

1. Search: search for information about the required products or services;
2. Comparison: comparison of prices and other attributes;
3. Examination, testing: examination of products, testing of products before purchasing;
4. Negotiations: agreement on the terms of purchase, i.e. on price, terms of delivery;
5. Placement of order and payment for product;
6. Delivery: delivery of product from the seller to the customer;
7. Post-service: post-sales services and fulfilment of guarantees of the seller.

Furthermore, the transaction costs model by Liang and Huang (1998) underlines the fact that there are various transaction costs which determine whether a consumer purchases product from electric stores. Among these factors, the following may be included: costs related to information search, attributes

comparison, product examination, negotiating terms, product payment, product delivery and post-sales services. Therefore, their proposed model generates the proposition that asset specificity and uncertainty of the product greatly affect transaction cost, which consequently influences a web purchase decision. Consequently, customers select the channel which reduces transaction costs. Evidently, the reduction of transaction costs is essential to an organisation, as this increases the possibility of a consumer purchase.

As an illustration of this, Table 3.2 presents several models of consumer decision making. As also suggested below, it must be noted that information and communication technologies support economic systems, by providing more efficient information flows which further improve the interaction between economic agents in the demanding environment of uncertainty and also reduce transaction costs.

Table 3.2 Comparison of several customer decision models

Customer decision process	CRLC	Mercantile Model	Transaction process
Problem recognition	Establish requirement	-	-
	Specify attributes	-	-
Search	-	Search	Search
Alternative evaluation	-	Comparison	Comparison
	-	-	Examination
	-	Bargaining	Bargaining
Choice	Select source	Order	Order
	Authorize and pay	Authorised payment	Payment
	Acquire		-
	Test and accept	Receipt of product	Delivery
	Integrate	Post-service: customer service and support	Post-service: customer service and support
	Monitor	-	-
	Upgrade	-	-

Table 3.2 (Continued)

Customer decision	CRLC	Mercantile Model	Transaction process
Choice	Maintain	-	-
	Transfer or dispose	-	-
	Accounted for	-	-

Source: Liang and Huang (1998, p. 21)

Regarding e-commerce, the customer buying decision-process is firstly determined by product information available. In today's highly digitised world, the customer transaction process has been improved by quicker and easier access to relevant information and in vast amounts. To better understand the impact of information and communication technologies upon organisational structure, Cordella (2006) proposes that a higher impact of the transaction costs approach upon the study of information systems is considered. He distinguishes three cost phases in the transaction lifecycle, namely:

1. Search costs: the costs of placing of information to provide the opportunities for exchange;
2. Negotiation costs: the costs of negotiating the terms of exchange;
3. Enforcement costs: the costs of carrying out the transaction.

Therefore, the transaction costs approach clarifies the existence of alternative forms of organisation on the basis of their relative efficiency in response to the combined effect of the environmental factors (i.e. uncertainty and small numbers) and human factors (i.e. opportunism and bounded rationality), as highlighted by Moe (1984) and Williamson (1998). By combining all these, Cordella (2006) concludes that transaction costs can be captured by the function below:

$$TC = f(U;C;Br;Ia;As;Ob;Cc) \quad (3.1)$$

where *TC* is transaction costs, *U* stands for uncertainty, *C* is complexity, *Br* is bounded rationality, *Ia* refers to information asymmetry, *As* is asset specificity, *Ob* is opportunistic behaviour, and *Cc* represents coordination costs. Terms are defined below:

- *Uncertainty* is a core assumption in transaction costs theory and related to unforeseeable circumstances in the future which are relevant for a transaction's outcome and distribution

of its benefits among partners. As these circumstances are unknown beforehand, they cannot be mentioned in the contract, which creates the room for its arbitrary interpretation of each partner in their favour (Williamson 1981).

- *Opportunism* (explanations both for and against) typically focuses on the proclivity of exchange partners to engage in deceptive and self-serving behavior (Hill, 1990; John, 1984; Williamson, 1985). Williamson (1985) largely regards opportunism as a behavioral trait embodied in economic actors. However, more recent research indicates that the context in which B2B exchange takes place has considerable impact on the incidence of opportunism (e.g. Gundlach, Achrol, & Mentzer, 1995; Rokkan, Heide, & Wathne, 2003).
- *Bounded rationality* is, basically, the assumption that one does not know everything one needs to know in order to make an optimal decision (Williamson, 1985).
- *Complexity* is the independent, transaction costs the intermediary and governance structures the dependent variable (Williamson, 1985).
- *Asymmetric information*, known as information failure, occurs when one party to an economic transaction has greater material knowledge than the other party. This usually obvious when the seller of service or good has greater knowledge than the buyer, although the reverse is possible (Williamson, 1985).
- *Asset specificity* within transaction cost economics states the main factor accountable for transactional cost dissimilarities between transactions is differences in the specificity of assets. Trades supported by redeployable (non-specific) investements are those well suited to neoclassical analysis. As a characteristic of the specificity of an asset becomes increasingly significant though, relations of exchange develop an increasingly bilateral character of trade. The reasoning behind which is that participants in trades such as these have a share in maintaining the relationship's continuity. Meanwhile, concerns in modifying bilateral contracts to circumstancial changes can be predicted to come up. Independent contracting within the market is therefore replaced by increasingly complicated governance styles as the specificity of assets deepens. Novel types of settlements for desputes may be developed (e.g. arbitration). Certain trades may be isolated from market transactions and instead structured internally. Heuristic modelling provides substance to the market or firm (buy or make) orientation (Williamson, 1985).
- *Coordination costs* emanate from transaction costs, which relate to "costs of achieving coordination and the costs of transaction specific risk resulting from the coordination"

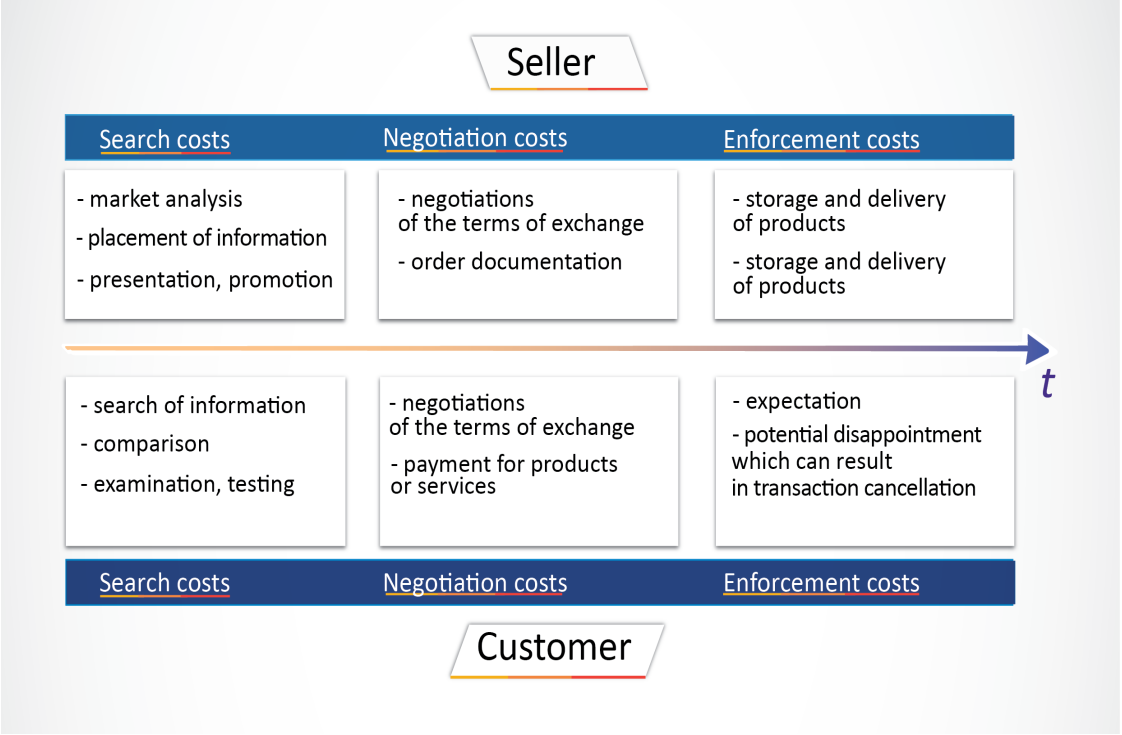
(Clemons & Row, 1992, p. 16). While costs of achieving coordination pertain to how firms will workwith each other to create efficient coordination mechanisms, transaction specific risk relates toavailability of transaction-specific capital, shirking, or loss of resource control (Kim, 2001). Bakos and Brynjolfsson (1998, p. 52) suggest that coordination costs entail "costs of setting up a relationship, search costs, and transaction costs".

Having analysed the material set forth in the above, an overview of the typology of transaction costs characteristic of the Internet space needs to be provided. A starting point is to determine the type of costs which are carried out by all the economic agents involved in a specific transaction. For simplification and illustrative purposes, it may be assumed that two agents are involved in the transaction: the online seller and the customer (i.e. the Internet user). The typology is outlined in Figure 3.3.

As illustrated in Figure 3.3, Ciborra (1983) visions the problem of designing information systems as an issue connected to the problem of designing an efficient economic system. The critical role of the information and communication technologies is to reduce transaction costs. He further demonstrates that the impact of the information and communication technologies upon transaction costs shall be evaluated in quantitative terms as well as with due account for qualitative changes (Ciborra, 1996).

Bakos and Brynjolfsson (1998) highlighted that information and communication technologies (ICT) may decrease the effect of opportunistic behaviour, thus increasing the possibility of monitoring the behaviour of agents in partnerships. Enabling tracking of variables in large numbers, it also facilitates an efficient accumulation of data in vast amounts, thus proving to be quite cost-effective in an economic partnership. A further reduction in costs, which are required for an understanding of the so-called focus of transaction, is witnessed, a phenomenon discussed and elaborated on by Malone et al. (1987). As also pointed out in their 1987 study, the minimisation of transaction costs is the greatest factor responsible for consumer purchase of products, as customers constantly seek channels perceived to be cost-friendly.

Figure 3.3 Typology of transaction costs of e-commerce companies



Source: compiled by the author based on Bakos (1991), Bakos and Brynjolfsson (1998), Ciborra (1983), Cordella (2006), Coase (1988), Malone et al. (1987)

According to Bakos (1991), the reduction in costs is of benefit, as it considerably influences competitive behaviour and thus significantly contributes to market efficiency for these types of electronic market systems. Reduced search costs also impact upon prices, buyer welfare and seller profits, given the fact that intermediation costs are reduced, thus leading to direct efficiency gains.

The transaction costs approach is based on the assumption that relations between human and environmental factors are one of the reasons for an increase in transaction costs of the economic system (Coase, 1988). However, this is not the only reason for the existence of such costs. The interdependence between factors which have an impact upon transaction costs may also contribute to their increase. Therefore, efforts to decrease transaction costs should not focus on reducing the influence of one factor, but instead should take into consideration the consequences of the interdependence between factors.

As a result, the influence of the virtual environment on different phases of the transaction process can be considered to effect both the buyer and the seller through the following aspects, thereby reducing the overall cost of the transaction:

1. ***Search costs***

In the first phase, as illustrated in Figure 3.3, the information and communication technologies can reduce the costs for the search of information if the increased amount of information or speed of its exchange or both is equalised by an identical increase in its ability to manage, process, and evaluate such information (Malone et al., 1987). Greater information results not only in lower uncertainty, but also in more significant complexity. Essentially, the communication and information technologies support functions at zero cost, while additional intermediaries (such as agents, post offices, and couriers) accomplish these same tasks and charge a fee. An example of the outcomes from the spread of communication and information technologies in e-commerce markets can be seen in the disintermediation of these markets.

The empirical research conducted by Bailey and Bakos (2015) reveals that the digitalisation of search can lead to ambiguous results: on the one hand, reducing search costs will further determine a reduction in intermediaries' significance by supporting consumers' direct search for relevant suppliers. At the same time, the dramatic overabundance of information available within the online marketplace may result in an increase in the need for intermediaries, which can further help match customers and suppliers by way of filtering information. Moreover, this scenario typically leads to higher transaction costs as a result of higher negotiation costs for economic actors engaged in such virtual markets.

According to a number of researchers headed by Grewal (2003), one of the most critical impacts of the Internet upon economic interrelations consists in reducing the price of information as a product and in the creation of technologies which are necessary in order to obtain, store and communicate information. Taking into consideration the specificities of information industry (e.g. high fixed costs and minimal variable costs), competition in the information market reduces the value of information in the market which results in maximum costs approaching zero (Stigler, 1961). It is thus not surprising that information which has been previously worth hundreds of dollars is now practically worthless on the Internet (Grewal et al., 2003).

The effect of the devaluation of information on the Internet leads to a reduction in the information asymmetry between the seller and the customer which exists within the traditional market (Levi & Kocher, 1999). On the one hand, the Internet effectively and timely allows consumers to compare prices for the same products provided by different vendors more efficiently, and at the same time to communicate information to other consumers via the means of the Internet. This results in a situation where sellers have to cut off prices for their products sold via the Internet (Bakos, 1998; Grewal, Iyer, & Levy, 2004). On the other hand, reducing information asymmetry subsequently results in minimising chances for the seller to earn the high costs of the search of information which are incurred by consumers. As a consequence of this, low prices and, subsequently, a low margin of online sellers determine market experts to pay considerably more attention to the ratio "price – utility for consumers – loyalty of consumers" (Grewal et al., 2003). Also by lowering the transaction costs and asymmetry in the information flows, the Internet reduces the probability of downfall in the market (Williamson, 1985).

In addition, it should be mentioned that a diffusion of cheap channels of communication of information implemented by means of the Internet as well as of destroying geographic boundaries by means of the virtual environment further results in an intensification of competition within the majority of all product markets which are present on the Internet (Windahl, Signitzer, & Olson, 2008). Thus, as the world today continues to thrive into a highly-globalised economy, it is also essential to note that competition is becoming global, which, in turn, forces businesses to invest in both information and technology. To keep up with the rapid changes and constant evolution, sellers have therefore adopted an international approach in marketing and selling their products. As a consequence of the development of a global economy, the growing international consumer outfit is easily catered for today, due to a generally easier access to information, product purchase and to delivery services available across and despite international boundaries (Chaffey, 2009; Grewal et al., 2003).

Furthermore, the rapid development of "seller-customer" technologies of interaction enhances an improvement of information flow, and also increases the amount of information which can be communicated to economic agents. The Internet thus provides direct access not only to information about products of any company available via the website of such company, but also to specialised search engines and trading portals (for example, Google Shopping, Yahoo! Shopping and others) (Grewal et al., 2003).

To sum up, modern Internet-based instruments enable firms to develop their marketing campaigns more appropriately. Additionally, it can be noted that, being guided by cookies and by online statistics of the websites, companies can portray the target consumer more accurately and thus more effectively use this portrayal towards ensuring the perfect market positioning (Grewal et al., 2003).

2. ***Negotiation costs***

In the second phase, as illustrated in Figure 3.3, understood as costs of executing the transaction, these types of costs may include costs of physically negotiating the terms of exchange, commission costs, as well as costs of formally drawing up contracts. At this stage, the best control of the costs can be exercised through the use of ad-hoc software, provided that quality of the rendered services may be maintained (Malone et al., 1987).The most sophisticated systems can decrease the costs associated with the management of the transaction when it is required to deliver products in compliance with the requirements of the respective agreement. However, the costs associated with the adoption of the ad-hoc software within a firm should not be excluded. Moreover, changing the distribution of information among economic agents by means of IT can alter the information symmetry among them, thus increasing or decreasing it and offering new opportunities for opportunistic behaviour. In contrast, Williamson (1979) defines it as information impactedness where units involved experience uncertainty at different levels because of the present asymmetries in the information which each unit is characterised by. This is the main reason why information impactedness is a market specific variable which stamps the electronic economic environment in which distinct units participate.

In order to manage transactions and ensure the guaranteed quality as well as to monitor the transaction process, the electronic market, similarly to the traditional market, as highlighted by Bakos (1998), needs to fix prices. It provides a fertile platform for the proliferation of new intermediaries which facilitates economic activities in the global, bounded-less environment of the Internet. A comprehensive analysis of the process of redesigning the organisation of intermediaries on the electronic market is provided by Sarkar, Butler and Steinfield (1995), the aim of such redesign being to enhance improved market efficiency. Criticising the standpoint of Benjamin and Wigand (1995), however, Sarkar et al. (1995) claim that the number of intermediaries and their role continually increases, thus potentially leading to higher negotiation costs for the economic agents operating in the virtual environment.

3. ***Enforcement costs***

In the third phase, as illustrated in Figure 3.3, enforcement costs are incurred by customers and sellers when, during the course of the transaction, the virtual products and services are translated into physical products and services. This particular feature encompasses any negotiations related to the wrong address of delivery, payment disputes, i.e., any investment undertaken to ensure that unsatisfied customers have their issues remedied through the enforcement of their rights outlined in the agreement regarding the transaction. In this case, the utilised information and communication technologies can make the process of exchange of information between the parties more expedient and efficient, increase the links between them and, as a result, improve the quality of the information flow among economic agents (e.g. Hennart, 1993; North, 1990; Williamson, 1985).

An application of information and communication technologies can change the symmetry of the information flow, which may potentially present the risk that opportunistic behaviour might occur. According to the transaction costs approach, considerable complexity and uncertainty inherent to the electronic market make the contractual obligations of the parties complex as well as expensive, due to environmental unpredictability. Angelov and Grefen (2003) point out that the increasing complexity and uncertainty faced by companies in the virtual environment also entails increasing the number of contracts concluded by this type of companies. This is one of the reasons why it is essential to note that an unforeseen environmental shift complicates the writing and enforcement claims contracts. Although the market mode remains of an advantageous nature, transactions tend to be undertaken less smoothly in comparison to more certain environments.

Cosequently, Daskalopulu and Sergot (1997) pointed out the increased complexity of the content of claims contracts, thereby increasing the cost of maintaining claims contract relationships. A higher number of contracts, coupled with their complexity, further lead to increasing transaction costs which are incurred through investments in the control system which is employed in the contractual relations of a company.

Besides, according to the data presented in Figure 3.3, it can be assumed that, after each completed transaction, a relationship of confidence between the customer and the seller is established. According to Williamson (1979), the frequency of transactions reduces transaction costs. Under the conditions of the Internet environment, after each completed transaction, the seller essentially obtains one positive

review. As time passes, the seller acquires a reputation which can be characterised by either of the two statuses: popularity and unpopularity.

Consequently, it is concluded that the high popularity of any Internet-based company or any product available on the Internet is associated with lower transaction costs of such a company. To understand whether this is the case, it is necessary to turn to a detailed categorization or classification of the consumer segment within the Internet marketing, which can be found in the following section. The study explores multiple dimensions of companies, such as how the products are presented to the public, the type of products they provide, and how they are distributed, to classify these companies and help determine how their transaction costs play a role in their popularity.

3.2 Classification of products and services according to the informativity criterion

A number of key concepts, such as information products, e-commerce products and information contents (informativity) of products, were considered in detail in the second chapter of the present research study. For instance, section 2.5.1.1 has pointed out that a classification of products by informativity is crucial in Internet marketing as well as underlined that the International Classification of Goods and Services (ICGS) remains the main system of classification utilised by the majority of nations engaged in e-commerce (Platek, Thomson, & Gallup, 2004).

To develop a classification of products by informativity, it is required to gain insight into the type of information which can be stored in any product from the standpoint of utility and value for consumers. From the point of view of perception via sensory organs, information can be auditory, visual, olfactory, taste and tactile. Particularly in the case of humans and how they process these types of stimuli, from the point of view of the form of presentation, information can be symbolic (textual and numeric), graphic, audio, and multimedia (Betts et al., 2015; Platek et al., 2004; Wickelgren, 1977). The relation between these two classifications is presented in Table 3.3.

Table 3.3 Types and forms of presenting information on the Internet

Type of Information	Form of Presentation
Auditory	Audio Symbolic
Visual	Graphic Symbolic Multimedia
Olfactory	Symbolic
Taste	Symbolic
Tactile	Symbolic

Source: compiled by the author based on Betts et al. (2015), Platek et al. (2004), Wickelgren (1977)

Regarding the speed of perception of information, it should be noted that a human being perceives auditory, visual and olfactory information faster than taste and tactile information. Auditory, visual and olfactory information are contactless, and so their perception by the brain is more rapid than the other senses (e.g. Platek et al., 2004; Wickelgren, 1977). To perceive taste or tactile information, human beings need to touch or to taste the container of such information (Betts et al., 2015). Unfortunately, Internet-based technologies do not make it possible to communicate in full or at least three types of information – olfactory, taste and tactile. In this respect, there arise complications related to the selling of products which contain such types of information on the Internet. So far, the only alternative is to present these types of information by using symbolic information or, more precisely, by means of textual descriptions (Card, 1999; Chen, 1999). Informativity of products can therefore be presented by means of sum of components, depending on the types of information, namely:

$I_p = I_a + I_v + I_o + I_{ts} + I_{tc}$ (3.2) based on Green (2001), Jordan (2000), Jordan and Green (2002)

where

I_p – informativity of products;

I_a – contents of auditory information;

I_v – contents of visual information;

I_o – contents of olfactory information;

I_{ts} – contents of taste information;

I_{tc} – contents of tactile information.

According to the formula above, perfect products can be distinguished on the basis of informativity, as shown in Table 3.4. Seeking the "perfect" product remains an essential goal for both marketing management and designers. The perfect product is a theoretical concept; however, similar to an evanescent point in the distance. It is unlikely that a designer will ever create the perfect product. Based on the model presented above, the perfect product is that product which is superior to alternatives and accomplish most of the types of information.

Table 3.4 Perfect products based on informativity

Formula	Description	Examples of Products
$I_p \approx I_a$ where $\{I_v, I_o, I_{ts}, I_{tc}\} \rightarrow 0$	Perfect audio (auditory) products	Musical compositions
$I_p \approx I_v$ where $\{I_a, I_o, I_{ts}, I_{tc}\} \rightarrow 0$	Perfect visual products	Cliparts, e-books
$I_p \approx I_o$ where $\{I_v, I_a, I_{ts}, I_{tc}\} \rightarrow 0$	Perfect olfactory products	Perfumes, cosmetics
$I_p \approx I_{ts}$ where $\{I_v, I_o, I_a, I_{tc}\} \rightarrow 0$	Perfect taste products	The majority of food products
$I_p \approx I_{tc}$ where $\{I_v, I_o, I_{ts}, I_a\} \rightarrow 0$	Perfect tactile products	Various products for visually impaired persons

Source: compiled by the author based on Green (2001), Jordan (2000), Jordan and Green (2002)

Depending on the combination of terms in the model (3.2), it is possible to describe all the categories of products in terms of informativity. For example, informativity of beauty products (toothpaste etc.) can be presented by the formula: $I_p = I_v + I_o + I_{ts}$ where $\{ I_a, I_{tc} \} \rightarrow 0$, since when purchasing, a consumer firstly focuses on taste, smell and package or on the “trade dress” (Menell, Lemley, & Merges, 2007, p. 29).

It is suggested that, in order to figure out what products are the most successfully sold on the Internet market, businesses may employ the model 3.2. By means of Internet-based technologies, present-day sellers can communicate in full only auditory and visual information. Unfortunately, so far current technologies have not made it possible to communicate the other three types of information. However, as previously stated, this information can be partially communicated only by means of textual

"digitising" (Barnes, 2002, p. 94). Consequently, from the viewpoint of informativity, e-commerce products can be classified as indicated in the following Table 3.5.

Table 3.5 Classification of products on the Internet market

Name of category	Description of category	Examples of products
Perfect e-commerce products	Products containing either only auditory or only visual information or a combination of both	Movies, musical compositions, e-books, software, databases
Imperfect e-commerce products	Products containing olfactory, taste or tactile information besides audio or visual information or both	Home appliances, computer equipment, and electronics, musical instruments, cars, furniture
Strongly imperfect e-commerce products	Products which contain minimum auditory or visual information or in which such types of information are absent at all	Food products, perfume, apparel, cosmetics

Source: compiled by the author based on Barnes (2002), on Green (2001), Jordan (2000), Jordan and Green (2002)

Whereas this classification provides a valuable theoretical framework, it has been suggested that it can be complemented by other classifications of products and services (Vijayasarathy, 2002). To this end, perfect e-commerce products, which are products containing either only auditory or visual information or a combination of both, such as e-books, movies and software, are considered in much more detail, by using the example of software.

3.2.1 Software classification

According to ISO/IEC-Norm 24765, software is: "a program or a set of programs used to run a computer. All or part of the programs, procedures, rules, and associated documentation of an information

processing system" (ISO, 2010, p. 329). According to the method of distribution and use, software is classified as an open source, free and proprietary.

Open source software is software with open source code. The source code of such software programmes is accessible for viewing, exploring and modification, which enables the user to refine such an open source programme by his/her efforts as well as to use the code in order to create new software programmes and to fix bugs and errors (Fuggetta, 2003). At present, the majority of open source programmes are freeware. However, these two notions should not be identified as synonymous. Instead, it should be taken into account that there are a number of software programmes which share the status of open source commercial software. As a rule, software companies release several versions of their products, one of which is an open source version. In such a case, the functionality of the latter version is rather limited as compared to the paid-for alternatives, since it is meant to serve as a launchpad for the paid-for version. In point of fact, in this case, any user who has the required expertise in this area of knowledge can be a developer of new open-source-based software (Jaeger & Metzger, 2011).

Free software comprises software products users which have unlimited rights to install, start up and to free use, while the exploration, distribution and modification of these products and their corresponding rights are protected by the law of copyright by means of free licences. A certain similarity can be found between the notions of free software and freeware. In general, free software products are available without payment, but they can partake a price, for example, in the form of charge for physical media on which this type of products are supplied, and this specific price is certainly included in the prime cost of these particular products. As a rule, business models of free software, such as new areas of application, training, integration, configuration or certification, rely on the principle of the capability approach. At the same time, a number of business models which involve proprietary software, particularly those which make users pay for a licence, so that they would be able to use the software product legally, may not be compatible with free software (Stallman & Gay, 2002; Zittrain, 2004).

Proprietary software is a product which is private ownership of the authors or right holders. The source code of this type of product is closed and is not accessible to users for the purpose of modification. Under these circumstances, the right holder reserves the exclusive right to use, to copy and to modify the product. Proprietary software can be commercial (i.e. created for the purpose of profit making by way of using thereof by consumers, for example, by selling of instances) (Zittrain, 2004), freeware or shareware (copyright programs provided on a basis, i.e. the user downloads the program and makes a

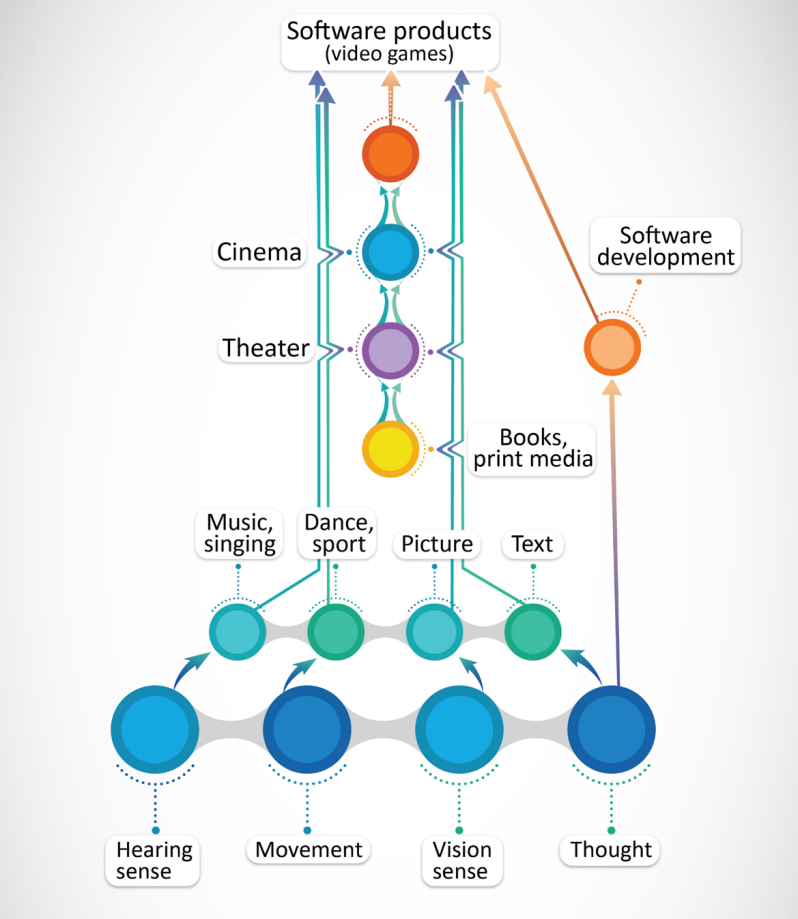
voluntary donation to the supplier if it proves to be useful) (Longley & Shain, 1986), a distinction which will be considered in-depth later in the present research study, and more specifically, towards the end of the current section.

Software products, as a set of mathematical and computer modelling, programming, a combination of video, animation, and works of music, are thus positioned at the highest level, due to the forms of information. The software may have its idea, concept, scenario and performance similar to theatrical performance (games for personal computers may serve as examples). Finally, all the above would be compatible with regular human capabilities, which include visual and sound perception, brain activity and ergonomics (Manovich, 2013). Taken together, all these make software a rather complicated product. For illustrative purposes, information hierarchy of a single example of software – computer or video game – is shown in Figure 3.4.

At the time when the software industry had just begun to take off, software programmes were not treated as product items (Hawkins, 2004, p. 112). Instead, they served only as an auxiliary element for selling of computer facilities. Such policy is still welcome in various firms, for example, in Apple Inc., which is a supplier of innovative technological platforms such as the iPhone and iPad. While doing so, Apple Inc. develops proprietary operating systems and core software for such platforms (Hawkins, 2004, p. 104). Similarly, Microsoft Corporation is also at the centre of innovative software technology. At the same time, nowadays there are gigantic developers of software products which, for several decades, have been providing consumers with software applications as a standalone product, such as the Microsoft Corporation packages, which is the largest. Over 80% of its income accounts for revenue from sales of software (e.g. Forbes, 2017; Microsoft, 2017). The corporation engages in development and marketing of both software and hardware services. It offers various products, and mainly operating systems for devices and servers.

In the last decade more and more, free software products have appeared on the software market. For example, Apache, a free web server, has come into widespread acceptance among users, and currently holds almost two-thirds of the web server market, thus leaving behind its nearest competitor of Microsoft (Hawkins, 2004). According to Netcraft Ltd. (2011), as of January 2011, more than 160 million websites were serviced by Apache web server, which represents 59% of the total number of websites.

Figure 3.4 Software products in information hierarchy



Source: compiled by the author based on Manovich (2013)

Quite often, a comparison of commercial Microsoft Word and OpenOffice.org Writer, its nearest competitor, can be found in the literature (Ven, van Nuffel, & Verelst, 2006; e.g. Weber, 2004). This adversarial relationship between paid and free software is one of the most famous at present. Several studies (e.g. Economides & Katsamakas, 2006; Zittrain, 2004) have revealed the difference between free and paid software, mainly in terms of their function. However, these types of products may be considered from another point of view, in an attempt to facilitate a broader understanding of the products' entire scope, since difference is not only a functionality question, but also one of fundamental value-based orientations.

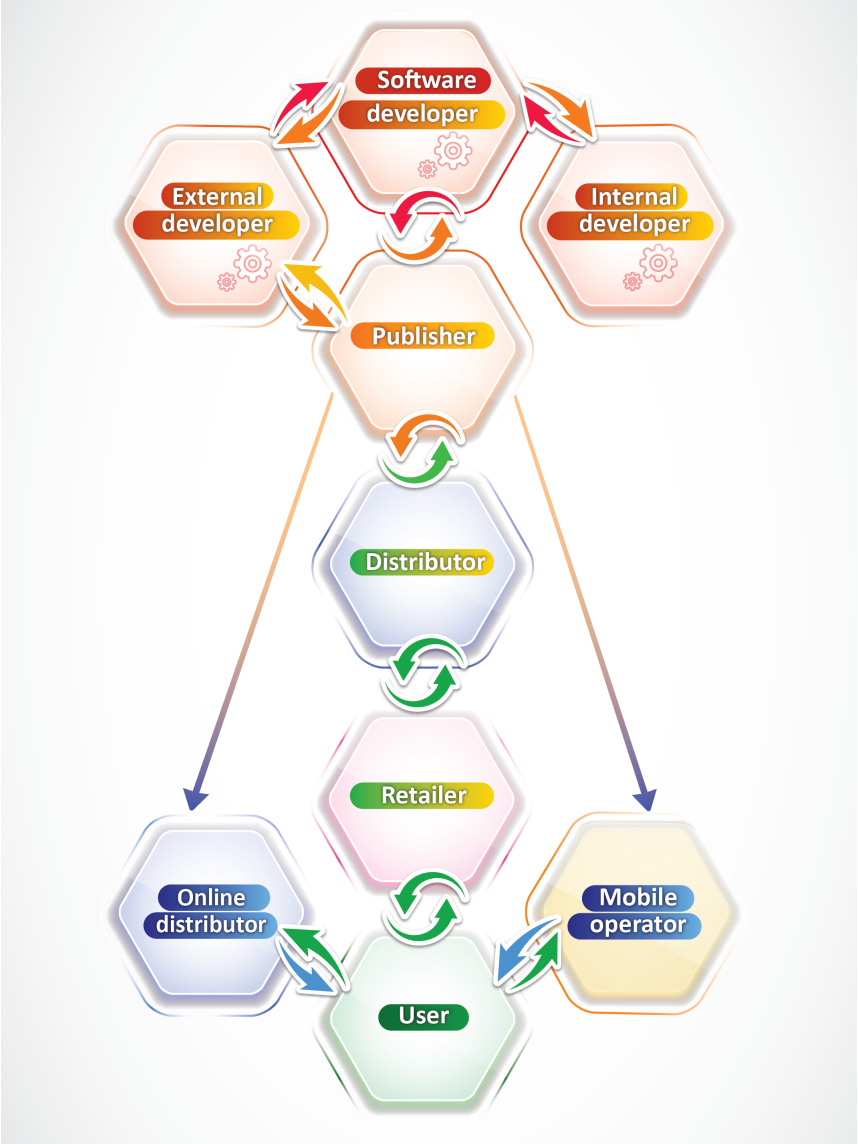
It is a developer who is directly engaged in the creation of a software programme. Such a developer can be represented by one expert or by a company. Typically, large commercial software projects are developed by development teams by considering the scale of the company. As a rule, a development

team includes programmers, designers, artists, sound designers (for example, for games) and testers (Hawkins, 2004). External and internal developers generally supervise development. Internal developer works for the software developer company and is engaged in the management of the project, personnel, and sales. An external developer works for the publisher and supervises the process of development and the project's budget. The duties and responsibilities of the software developer thus frequently include public relations, contract negotiations, control of the project budget and other functions (Wheeler, 2015). The publisher is a company which is engaged in publishing software on physical media. The publisher is responsible for the developed product on the whole; he/she organises marketing researches and is engaged in advertising. Large publishers deal with the distribution of games, for instance, while small publishers involve outsourcing and consequently employ third-party distributors who directly contact end users. At present, the Internet is the primary distribution channel for paid software. Publishers may involve online distributors who sell games via the Internet – for example Amazon.com, cyberport.de – as well as mobile operators (Hawkins, 2004; Meyer & Popp, 2010; Popp, 2011). Concerning paid software, the overall process from developing to the selling of software products to end users is shown in Figure 3.6.

Several researchers speak in favour of developers of free software, referring to the codes and culture of programmers who are interested exclusively in the process of product manufacturing rather than in revenue from sales thereof. For example, Lerner and Tirole (2002) examine altruism and status-seeking of creators of free software programmes as compared to other programmers and users as a motivating factor. One study by Johnson (2002) also reports an increasing interest in product-development and operations teams in the creation of products which are a necessity and useful for themselves, that is, users can create a software programme adjusted and tailored to their demands, by using open code.

As noted in the above, the principal peculiar features of manufacturing and distribution of perfect e-commerce products have been analysed by examining the example of paid and free software products. As shown in earlier research works, the motives and reasons of manufacturing of software products typically differ. Although that is the case, product sellers appeal to different targeted consumer groups by implementing product policy which optimises consumer preference towards the products.

Figure 3.5 Flowchart of developing and distribution software



Source: compiled by the author based on Lerner and Tirole (2002), Hawkins (2004), Meyer and Popp (2010), Popp (2011), Wheeler (2015)

In the next section, it will be endeavoured to build a model of product competition of e-commerce companies, based on various factors which may influence the popularity (sales) of e-commerce companies and, thus, the level of transaction costs of this type of companies.

3.3 Model of product competition of e-commerce companies

As outlined in the literature review included in chapter two, it is claimed that, among e-commerce firms, it is possible to distinguish the following factors of product competition which shape and influence the Internet market, create competitive advantage (e.g. Grewal et al., 2004; Price, Cameron, & Butow, 2007; Shin, 2001) and could be used for creating product policies:

a. Expert and consumer reviews
b. Manufacturer's brand
c. Advertising activity of a company
d. Category of products
e. Competition

A fundamental proposition of this research is that consumers, acting rationally, make their decisions about acceptance or rejection of channels on the basis of their perceived channel net value, which is a compromise between the overall benefits that can arise from the use of electronic channels compared to existing alternatives (traditional channels) and the general barriers they encounter when using them or deriving the desired benefits. Consumer use of the Internet is generally assumed to be more purposive and goal-directed, and therefore more "rational"(Komiak & Benbasat, 2004; Komiak & Benbasat, 2006). The issue remains unsolved as to why users, consumers and customers choose to pay large sums to purchase a licence for paid (proprietary) software when freeware exists as a valid alternative (Choudhary, 2007; Hsu & Shiue, 2008; Raghu, Sinha, Vinze, & Burton, 2009). It cannot be unequivocally said that freeware has small functional capabilities as compared to the paid analogues. As previously noted, there is freeware on the contemporary software market which surpasses paid competitors in terms of their capabilities. On the other hand, when software developers release several versions of a product, both for purchase and free of charge, consumers know in advance that the functionality of the free versions will be less than that of the paid versions. Nevertheless, consumers frequently still download the free installation packages for a variety of reasons. For example, they may want to simply use the product on a trial basis. Or they may download the product simply because the product is free of charge.

Ariely, Shampan'er and Mazar (2007) describe a number of experiments dealing with the issue of what zero costs are worth for consumers. Zero monetary units per unit of the product do not imply only the price for this product. Zero cost also triggers an emotional button – a source of irrational excitement.

When consumers face a choice of one or several available products, then, according to the classical economic theory, consumers would choose the product with the best price/quality ratio. However, when consumers are faced with products which are free, this theory breaks down: consumers are then keen to this type of product. In this case, it is practically impossible to bring price into correlation with quality.

Ariely et al. (2007) have also considered three models of consumer choices for one particular product or another. In the first case, X and Y products have P_x and P_y prices, respectively, and V_x and V_y represent quality (or value to consumers). Then, consumers choose product X if:

$$V_x > P_x \text{ and } V_x - P_x > V_y - P_y. \quad (3.3) \text{ (Ariely et al., 2007)}$$

A consumer would choose product Y if:

$$V_y > P_y \text{ and } V_y - P_y > V_x - P_x. \quad (3.4) \text{ (Ariely et al., 2007)}$$

A consumer would purchase nothing if:

$$V_x < P_x \text{ and } V_y < P_y. \quad (3.5) \text{ (Ariely et al., 2007)}$$

This is exactly how the price/quality model can be presented in terms of classical interpretation. In the second case, a model with discounts for products is considered. Assuming that prices for both products are reduced by ε value, then the first case can be modified as follows. A consumer would choose product X if:

$$V_x > P_x - \varepsilon \text{ and } V_x - P_x > V_y - P_y \quad (3.6) \text{ (Ariely et al., 2007)}$$

A consumer would choose Y product if:

$$V_y > P_y - \varepsilon \text{ and } V_y - P_y > V_x - P_x \quad (3.7) \text{ (Ariely et al., 2007)}$$

A consumer would purchase nothing if:

$$V_x < P_x - \varepsilon \text{ and } V_y < P_y - \varepsilon \quad (3.8) \text{ (Ariely et al., 2007)}$$

Furthermore, Ariely et al. (2007) point out that, in both cases, the consumer generally chooses the same product. According to the second model, when prices for two products are reduced by equal value, demand for these products changes insignificantly. In the third model, Ariely et al. (2007) have assumed that prices for both products are reduced again. In doing so, the price for *X* product becomes equal to zero. Moreover, a consumer unconsciously adds α additional value to the existing quality of the product. Then the model can be presented as follows, where a consumer would choose product *Y* if:

$$V_Y > P_Y - \varepsilon \text{ and } V_Y - P_Y > V_x + \alpha \quad (3.9) \text{ (Ariely et al., 2007)}$$

A consumer would choose product *X* if:

$$V_x + \alpha > 0 \text{ and } V_x + \alpha > V_Y - P_Y \quad (3.10) \text{ (Ariely et al., 2007)}$$

Ariely et al. (2007) have named this phenomenon the *zero-price effect*. In their research, they proved the validity of this model by using the results of several field studies. Relying on the result of their research, it is necessary to ascertain which factors determine this type of irrational behaviour of consumers within the market for software applications. As noted earlier in the section 2.5.2, instead, consumers on the Internet can be guided by a number of external factors which can be expressed as illustrated in the following model:

$$R = f(Cr, Ur, Br, Adv, Ct, Cmp) \quad (3.11)$$

where

R – revenue;

Cr – reviews of critics;

Ur – reviews of users;

Br – brand;

Adv – advertising;

Ct – category;

Cmp – competition.

To build this model for paid (proprietary) software (*ps*) and free software (*fw*), the dependence between the number of downloads *D* ("revenue") and the factors which influence them are expressed as two linear regression equations, as indicated below:

$$D_{ps,i} = \alpha_0 + \alpha_1 Cr_{ps,i} + \alpha_2 Ur_{ps,i} + \alpha_3 Br_{ps,i} + \alpha_4 Adv_{ps,i} + \alpha_5 Ct_{ps,i} + \alpha_6 Cmp_{ps,i} + \varepsilon_{ps,i} \quad (3.12)$$

$$D_{fw,i} = \beta_0 + \beta_1 Cr_{fw,i} + \beta_2 Ur_{fw,i} + \beta_3 Br_{fw,i} + \beta_4 Adv_{fw,i} + \beta_5 Ct_{fw,i} + \beta_6 Cmp_{fw,i} + \varepsilon_{fw,i} \quad (3.13)$$

Factors which past research and theory have suggested are important drivers for revenue are included in the model. It is not feasible to verify other factors within the scope of this research. Future research may be geared at discovering and including additional factors in the model. The current model is simply a relational model and not a causal model, so future research could also be aimed at finding a natural experiment to exploit to tease out causal relationships. However, to address potential unobserved heterogeneity, our final specification controls for companies' individual time-constant characteristics. To achieve the aim of the present research study we will explore how factors affecting the demand for software differ for paid versus free products, or more specifically how vector $\boldsymbol{\alpha}$ differs from vector $\boldsymbol{\beta}$ in the regression specification. The study also aims to identify the marginal effects which these various factors have on consumers' purchase choices between free and paid e-commerce products and ultimately will affect e-commerce companies' revenue. Thus, the first empirical study runs a regression analysis looking at the relationships among the following factors for free/paid software of firms offering software products globally: (i) opinions of critics, (ii) opinions of users, (iii) level of competition, (iii) advertising, (iv) brand by using the expression 3.11.

In the next section, the optimal conditions required for implementing product policy within e-commerce companies are examined.

3.4 Condition of optimality of implementation of product policy by e-commerce companies

To solve the task of optimality of the product portfolio of an e-commerce company, one must determine the boundary conditions so that (e.g. Eaton & Lipsey, 1975; Landsburg, 2014; Lipsey & Chrystal, 2015; Samuelson & Marks, 2003):

- the company maximises profits;
- the company minimises transaction costs.

As section 3.2 described, when it comes to perfect e-commerce products, a potential buyer can judge about their characteristics from visual or audio or both information, meaning that they can make and realise buying decisions remotely. Unlike perfect products, imperfect e-commerce products have characteristics a person can judge only at a selling point. Thus, perfect e-commerce products contain either only auditory or visual information, or a combination of the two, imperfect products contain olfactory, taste, or tactile information besides audio or visual information or both, and finally strongly imperfect e-commerce products contain minimal auditory or visual information or in which such types of information are absent at all (e.g. Barnes, 2002; Green, 2001; Jordan, 2000; Jordan & Green, 2002). Consequently, costs related to making and realisation of buying decisions should differ across product groups. In the case of perfect products respective transaction costs should be lower than the transaction costs related to the same decisions for imperfect products. The same is true if one compares transaction costs for imperfect and strongly imperfect transaction costs, as they differ from each other by the number of characteristics a person can judge about at a selling place. In particular, most characteristics, including the most important ones, of strongly imperfect e-commerce products are those requiring a person at a selling place, while imperfect e-commerce products have a lower share of the characteristics of this kind. As such, the most suitable product sold via the Internet has the lowest transactions costs. This rationale may be represented the following way:

$$TC_{pp} < TC_{ip} < TC_{sip} \qquad (3.14)$$

where:

TC_{pp} – transaction costs related to selling perfect e-commerce products;

TC_{ip} – transaction costs related to selling imperfect e-commerce products;

TC_{sip} – transaction costs related to selling strongly imperfect e-commerce products.

A successful e-commerce company ideally fits the market in that it is capable present all the details of the products and arrange the transactions online, which suggests minimal transaction costs. On the other hand, e-commerce companies of other categories differ in that they need offline activities to promote and sell their products which impose on them additional transaction costs.

Based on Williamson's model of managerial discretion (Williamson, 1964) and the assumption that the model considers economic agents who sell all three product categories on the Internet, the profits obtained by an agent can be expressed as follows.

$$NP = NP(PC, TC) \quad (3.15)$$

where:

$$PC = PC_{pp} + PC_{ip} + PC_{sip} \quad (3.16)$$

$$TC = TC_{pp} + TC_{ip} + TC_{sip} \quad (3.17)$$

In general terms, profits can be expressed as follows:

$$NP = GP - PC - TC \quad (3.18)$$

where:

NP – net profit;

GP – gross profit;

PC – production cost;

TC – transaction costs.

Thus, net profit is gross profit minus total costs comprised of transaction and production costs. Assuming that a company is concerned with the profit relative to transaction costs, the objective function is as indicated below:

$$\frac{NP}{TC} = \frac{GP-PC}{TC} - 1 \quad (3.19)$$

As follows from the model, gross profit (GP) depends not only on the production costs, but also on the transaction costs. These costs contribute to gross income making output and sales higher but are extracted from gross income. If a company is concerned with its net profit relative to its transaction costs, then the company solves the following problem:

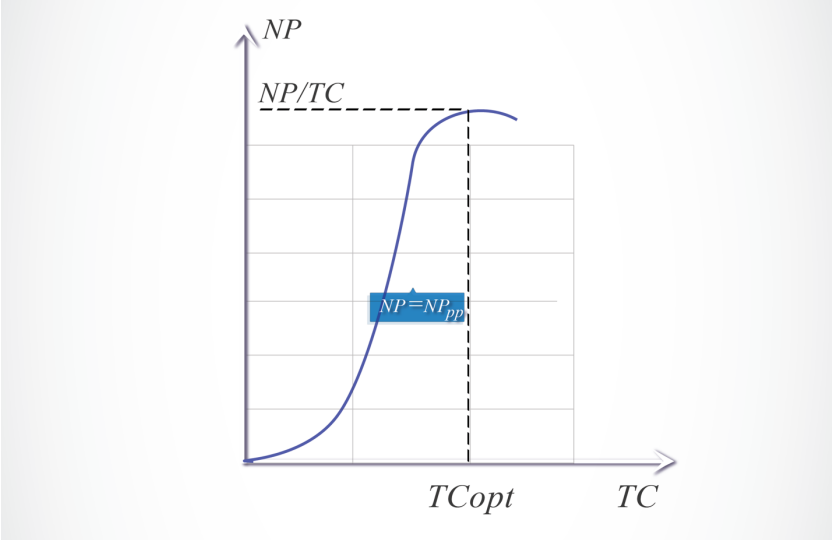
$$max(\frac{NP}{TC}) \quad (3.20)$$

The maximisation problem suggests that the company should stop increasing transaction costs when this ratio is maximal, so that the subsequent increment in transaction costs will decrease it. Performing a differentiation of this expression with respect to transaction costs and set the result to 0, the model below is suggested:

$$\frac{\partial NP}{\partial TC} \times \frac{TC}{NP} = 1 \quad (3.21)$$

Thus, equation (3.21) is the *optimality condition of implementation of product policy by an e-commerce company*, as it follows from the maximization problem solved by the company. A company which sells only perfect e-commerce products is a "*perfect e-commerce company*". In this case, the profit function curve is the most closely approximated by the curve of net profit function, where the transaction costs are at optimal level (Figure 3.6). If the structure of the product portfolio is changed, provided that the number of units of products to be sold is maintained at the same level and also that all the products are of the same value, profits will be lower than possible, due to the fact that transaction costs would not be on the optimal level. Therefore, to maximise the relative profits, an online seller should have the most profitable product portfolio.

Figure 3.6 Condition of optimality in the implementation of product policy by an e-commerce company



Source: Compiled by the author

where:

NP – net profit;

TC – transactional costs;

NP_{pp} – profits from sales of perfect e-commerce products;

TC_{opt} – level of transaction costs under the optimal conditions.

Indeed, economic agents who sell only strongly imperfect products compared to companies whose products are perfect or simply imperfect, face more severe restrictions, the reason being that they are not able to realize the opportunities of sharing the features of their products with their customers through the Internet. The optimality condition of implementation of product policy by e-commerce companies contains several theoretically relevant lessons for e-commerce firms. First, it develops the theoretical apparatus for the study of the efficiency of the building of the product portfolio of e-commerce companies; the results obtained make it possible to carry out an in-depth study of the issues related to the optimisation of transaction costs in the Internet market. Secondly, the condition of optimality allows one to determine the efficiency and optimality of the product portfolio of any single economic agent (enterprise or company) on the virtual consumer market. Thus, based on a firm's transactions costs and the level of

optimality in the implementation of product policy, the following groupings regarding the effectiveness of the e-commerce company are expected and will be empirically tested in the second empirical study:

1. The company is a *perfect e-commerce company* (**1st Category**). The company gains the highest possible income in the current conditions and has the optimal level of transaction costs; the company's website is characterised by high traffic, great link popularity in the leading search engines as well as a significant number of mainly positive reviews; therefore, the company has an optimal product portfolio consisting of only perfect e-commerce products.

2. The company is a *highly-effective e-commerce company* (**2nd Category**). The company gains sufficiently high-income possible under the current conditions and has near optimal level of transaction costs; the website of the company is characterised by high traffic, satisfactory link popularity in the leading search engines and a high number of reviews of various nature; the company sells mainly perfect e-commerce products which stimulate consumer demand; as a result, the product portfolio of the company is balanced.

3. The company is a *low-effective e-commerce company* (**3rd Category**). The difference between the gross income and the net income of the company is great; the company's transaction costs are high; the company's website is characterised by low traffic, low link popularity in the leading search engines and a small number of reviews, mainly negative; the company sells mainly products which do not stimulate the consumer demand, all of which render its product portfolio low-effective.

Based on the research question and analysis, the following hypothesis could be formulated:

A perfect e-commerce company (1st Category) and a highly-effective e-commerce company (2nd Category) have optimal levels of transaction costs (H6).

The second empirical study then uses longitudinal data on the financial performance of several companies to determine the effectiveness of their product policies. By implementing these empirical studies, the research brings theory to the real world and allows the data to speak directly to the specific effects that different marketing strategies have on consumer demand in the e-commerce world.

3.5 Conclusion of the chapter

In this third chapter, the typology of the economic institutions of the virtual environment, which includes both the institutions of traditional business and the specific institutions of the Internet environment, has been proposed. Institutions of marketing of e-commerce companies have been distinguished, and their particular features have been described. The scientific novelty of the development of the typology of institutions of the virtual environment lies in the development of the new institutional system, which enhances the impact of the known typologies of the economic institutions of the real economy upon the sphere of virtual business relations. The knowledge increment includes the creation of the new typology of economic institutions, and thus takes into consideration a series of institutions specific to the Internet environment. The scholarly importance of the development of the typology of economic institutions of the virtual environment also resides in the enhancement of the theoretical concepts of the impact of the institution-based structure upon the Internet environment. The practical implications of the development of the typology of economic institutions of the virtual environment involve the development of the methodology of designing and forecasting the development of institution-based structures of virtual economic relations.

The typology of transaction costs in the Internet environment has been suggested to enhance theoretical approaches to the description of the interaction between subjects of e-commerce. The scientific novelty in the development of the typology of transaction costs within the Internet environment can also be noted in the creation of a new model of transaction-based interaction of economic agents under the conditions of the virtual market. The knowledge increment thus includes the creation of a transaction model which takes into consideration the specificity of virtual economic relations. The scholarly importance of the development of the typology of transaction costs in the Internet environment also resides in deepening the knowledge of transaction processes under the conditions of the virtual economic environment. The practical implications of the creation of the typology of transaction costs on the Internet also imply an identification of the methodological basis for analysis of the transaction-based interaction of economic agents within the virtual economic environment.

The condition of optimality in the implementation of product policy by the e-commerce companies by means of analysis of e-commerce companies' product portfolio on the basis of the informativity of the products to be sold has been determined. The scientific novelty is that this approach is used for the first time and further research on the topic can enhance it. The practical implications of the model refer to

the possibility for the business entities operating under the conditions of the Internet market to assess the efficiency and effectiveness of their operation.

The model of product competition of e-commerce companies has also been advanced. The scientific novelty of this model comprises the modernisation of scientific approaches to research of marketing phenomena which occur in virtual markets. The knowledge increment includes the building of the model of competition which is specific to agents operating in the virtual environment. The scholarly importance involves contributing to the understanding of the economic activity of the subjects of the virtual environment. It is thus concluded that the practical implications involve the development of an applied model of assessment of the interaction among competing economic agents which operate under the conditions of the virtual environment.

CHAPTER 4. 1st STUDY: AN ECONOMETRIC ANALYSIS OF FACTORS OF PRODUCT COMPETITION ON E-COMMERCE SALES

In this chapter, an econometric analysis of factors of product competition on e-commerce sales is proposed. Several factors affect consumers' preferences and actual purchase choices, or in this case download, of free versus paid (proprietary) software. Using data from leading software source, more specifically, the download.com platform, which contains data on the downloads from the majority of firms offering software products globally, the model examines several of these individual factors on paid (proprietary) and free software downloads in an ordinary least squares regression analysis.

4.1 Method

The previous chapter lays down the theoretical foundation for the empirical analysis. As noted in the section 3.3 of the present research study, e-commerce companies' total sales, and hence their revenue, can be modelled by a number of both internal and external factors. Specifically, exogenous factors, such as critics' reviews, users' reviews, and the degree of competition amongst competing companies, all significantly enhance and determine both the popularity and sales level of these firms. It can be thus envisaged or noted that negative reviews and high levels of competition would diminish profits, while positive reviews and low levels of competition would contribute significantly to higher profits. Similarly, several endogenous factors on the part of the firm, such as the firm's brand, boost a firm's revenue, the level of advertising invested by the firm, the functionality of a specific product or software which is offered, and the category in which the firm chooses (or in some cases naturally falls in) to place its product.

As introduced earlier, the primary goal of this section is to identify the marginal effects of various marketing factors on demand for software and identify how they differ for paid versus free software. Specifically, the following factors are analysed: (i) opinions of critics, (ii) opinions of users, (iii) level of competition, (iii) advertising, (iv) brand. From chapters two and three, a number of theoretical predictions follow, which are now presented in the form of testable hypotheses. In particular, the hypotheses are tested as follows:

H1. *Advertising has a higher impact upon a product's revenue than its price (paid versus free software).*

H2. *The level of competition between companies offering the same product has a higher impact a product's revenue than its price (paid versus free software).*

H3. *The brand has a higher impact upon a product's revenue than its price (paid versus free).*

H4. *Opinions of critics have a higher impact upon a product's revenue than its price (paid versus free).*

H5. *Opinions of users have a higher impact upon a product's revenue than its price (paid versus free).*

4.2 Data

To test the marginal effects of these competitive factors, the data was collected in the period between October 1, 2017, and December 31, 2017, by using leading software source, more specifically, the download.com platform, which contains data on the downloads from the majority of firms offering software products globally. The unit of observation is a software programme. The dataset includes 540 observations which may be classified into 15 categories, including audio, browsers, business, communications, desktop enhancement, developer tools, digital photo, education, entertainment, games, graphic design, home, Internet, security, and video. The criteria used to identify a software as an appropriate research unit was that the item be a paid or free software. Each of the categories contains 18 shareware (i.e. free-to-try and paid) as well as 18 free software products. This research study examines firms associated with famous brands with large name recognition and market cap, such as Microsoft, Adobe, Apple, Macromedia, Blizzard Entertainment and Capcom, as well as little-known firms, those that are not common household names and with very small market caps, such as ES-Computing, Bohemian and Felt Tip. It is not obvious to separate the effects of market power and firm size, as these two are evidently correlated. The advantages of large firms are commonly the disadvantages of small firms and vice versa (Vossen, 1998). Thus, a major advantage of the data is that it provides a strong basis for comparison and helps to understand better the marginal effects of the competitive factors.

The number of downloads serves as a key outcome (or dependent) variable, since it serves the purpose of identifying the number of downloads from a particular product. It is thus suggested that both critics' and users' reviews contain ratings on a scale of 0 to 5, with a step of 0.5, 0 being the most negative score and 5 indicating the top rating. The majority of expert assessments fall within the 3.0 to 4.5 range, with the average rating at 3.65. In addition, a brand dummy variable is included, so as to indicate whether or not the product belongs to a firm with a firm-specific brand. Furthermore, an advertising dummy variable is also utilised in order to identify whether or not the developer (seller) promoted the product.

The competition measure was constructed by calculating the number of downloads from the most popular competitor software programme in the same category for each product. It is important to note that this competition measure does not differentiate between paid versus free products in each category. For instance, when considering golf software, Mulligan's Golf Personal for Mac represents the most

popular product with the most downloads in the entire category. The competitors' downloads reflect not only the competitors' relative success, but also the market size.

In addition, the price of each software programme in US dollars is included as a key control. The price is obviously an endogenous variable, yet as this is not the variable of interest here and instead suggested for further research, the present research study has not aimed to instrument it. In the case of free products, the value of the software is 0. The majority of paid products are sold for less than US $100. Also, a "price type" indicator variable is considered and used in order to identify the type of product in terms of the price applicable to this type of product. As a result, it was mainly two types of software that have been distinguished: free and paid software. Additionally, the download.com website further breaks down paid software into new purchases (i.e. paid software) and updates (i.e. updates for the existing software products). To better garner interest and eventual sales, manufacturers of paid software invest both capital and time in trialling products or subscriptions to consumers, which is why they frequently release products of the paid software type. Depending on these investment and product release practices, the number of software updates is negligibly small compared with other product types.

The important variables of interest are the number of downloads, and hence the measure of competition. Their mean values are 104939.5 and 28667.5, respectively, while their median values are 2026078 and 2039356, respectively, thus indicating that the latter measures are highly right-skewed. This is also seen in the values of their skewness which equal 9.86 and 15.77, respectively. To make these measures closer to normally distributed variables, they are transformed by taking their logs. Since a number of observations have 0 downloads, in practice, the log is taken as *log(downloads + 1)*, which prevents overlooking observations without distorting the available data. The attributes along with their descriptions are provided in Table 4.1.

Table 4.1 Structure of research database of 1st study

Variables	Variable Description
Brand	The variable determines branded products. If the brand has been registered in WIPO database then brand = 1, otherwise brand = 0.
Advertising	The variable contains information of advertising the products. Advertising = 1 if developer (seller) promoting a product, 0 otherwise.

Table 4.1 (Continued)

Variables	Variable Description
Critics' Reviews	The variable describes experts' assessments of the download.com website (Editor's Rating). Each software is assessed according to a five-point scale with a 0.5 step.
Users' Reviews	The variable describes feedback from users of the software product. The ratings, similar to the range of expert assessments, fall within the range of a five-point scale with a 0.5 step.
Price	The variable contains information about the price of paid software products in US dollars. In the case of free products, the value of the variable equals zero.
Log of Downloads	The variable determines the popularity of software products. The variable contains information of the number of downloads of all the versions of a specific software product as of the specific date. As we lack the detailed data on the cash revenues this serves as a proxy of this.
Log of Competition Measure	The variable is also one of the most critical variables, since it indicates the popularity of the nearest competitor software products. The variable contains information of the number of downloads of the most popular competitor software programme which is the nearest functionality to the product under research.
The number of competitors	The variable presents a simple measure of the strength of competition. Unlike the competition measure above, this measures the overall level of competition.

Source: Compiled by the author

The variables listed in Table 4.1 characterize the transaction costs an e-commerce company deals with. For example, advertising costs depend on the category of a company. A perfect e-commerce company may focus on the advertising campaign online, while companies of other categories should involve in offline advertising activities which impact their relative advertising costs. Similar differences between them concern the other characteristics.

Before the regression analysis outlined in the following sections, it would be instructive to examine the sample statistics of all the variables used to check the differences between free and paid software in raw data. To this end, Table 4.2. provides descriptive statistics of the examined dependent and

independent variables and further outlines statistics characterising the free and paid software programmes utilised in the present analysis. By considering the data outlined below, it is suggested that Table 4.2 highlights a number of significant differences between the two types of software. Although free software is much less commonly promoted by means of advertising and is less regularly associated with a particular brand, it tends to attract higher reviews from both critics and users. More importantly, consumers download free software much more frequently than paid software. As a result, the constructed competition measure will disproportionately include downloads of free products over paid products, as illustrated below.

Table 4.2 Summary Statistics

Variable	Free Software			Paid Software		
	N	Mean	St. Dev.	N	Mean	St. Dev.
Advertising	270	0.007	0.086	270	0.463	0.500
Brand	270	0.552	0.498	270	0.604	0.490
Average Critics' Reviews	270	3.696	0.775	270	3.611	1.197
Average Users' Reviews	270	3.689	0.937	270	3.594	1.150
Price	270	0.000	0.000	270	64.267	109.244
Log of Downloads	270	11.724	2.412	270	11.382	2.464
Log of Competition Measure	270	10.431	2.757	270	9.675	2.751
The number of Competitors	270	495	289	270	502	291

Source: compiled by the author

4.3 Empirical specification

To estimate a linear regression of a continuous variable, the analysis was performed by using cross-section data, while an OLS was used as an estimator. The possible heteroscedasticity was coped by taking logarithms of the dependent variable and calculating heteroscedasticity robust standard errors via the use of the sandwich estimator. To test the hypotheses regarding the difference between paid and free software, the following specification may be used, as indicated below:

$$\log(D_{i,c,t}) = \alpha_0 + \beta_1 Paid_{i,c,t} + X_{i,c,t}\beta_2 + Paid_{i,c,t} \times X_{i,c,t}\beta_3 + C_{i,c,t}\beta_4 + \varepsilon_{i,c,t} \quad (4.1)$$

where $\log(D_{i,c,t})$ is the log number of downloads for product *i* in software category *c* in year *t*. The variable $Paid_{i,c,t}$ is a dummy variable indicating whether the product is free or a purchased product. In the final specification, this indicator variable is interacted with the vector of exogenous interest variables, $\mathbf{X}_{i,c,t}$, which includes critics' reviews, users' reviews, competition measure, and dummies for advertising and brand. Finally, vector $\mathbf{C}_{i,c,t}$ contains controls, which include the price, year and category-fixed effects. In addition, robust standard errors clustered at the software category level are estimated, allowing for correlation within software category levels. For the computing cluster robust standard errors, see Baum (2006).

As a starting point, a regression is assessed without the interaction terms, so as to check the links between the variables of the interest and the dependent variable. The dummy for paid software is then introduced. The most comprehensive specification includes the interaction terms.

Based on these hypotheses, put forth above, it is expected that the coefficients on both opinion variables would be positive, while their interactions with the paid software dummy would be negative. Likewise, the coefficients on the interaction terms with competitor downloads, advertising, and brand dummy variables should all be positive and significantly different from zero.

We use a log-linear specification taking the log of a dependent variable and the regressors in their original scale. The choice of this specification is motivated by both the statistical considerations and the data at hand. Taking the log of a dependent variable is a conventional way to make a residual distribution closer to the normal distribution and thus to interpret the results relying on the regular distribution-related test statistics, in particular, t-statistic. At the same time, the log form can allow for potential nonlinearities in the data. For the interest regressors, they are dummies, which prevents their use in the log form.

Log-linear specification suggests an interpretation of the coefficients as semi-elasticities, i.e., a relative change of a dependent variable in response to a unit change of a regressor. The formula for computing semi-elasticity after estimation of a log-linear regression is as follows: (exp(...)-1)*100% (Stock & Watson, 2018).

4.4 Review of findings

According to the hypotheses stated in the beginning of the section 4.1 the coefficients on the interaction terms β_1 should be positive and significantly different from zero. Their non-zero values would indicate the difference between paid and free software in the effect of the interest variables on downloads. Table 4.3 displays the results of the analysis. The first specification reveals highly significant relationships between all variables and downloads. A number of coefficients are characterised by their signs in line with the hypotheses. Critics' and users' reviews, in addition to advertising and branding, all have positive impacts upon downloads, while the price is inversely related to the number of downloads. What is rather intriguing is that the degree of competition is also positively associated with downloads. The reason can be related to the nature of competition within the software market, which have two significant characteristics. First, software companies operate in multiple markets, and they are likely to encounter several of the same rivals across a wide range of markets. Secondly, a range of markets where software companies operate are crowded with competitive rivals. The vast majority of competitive software products can be both complementary and substitute products for each other. Positive association between downloads of competitive software products may suggest that downloads normally complement each other, so that the use of a product induces the use of its competitive product.

The second column of the table illustrates a series of results related to controlling for whether or not the product was free. The coefficient on the dummy variable is highly significant and further indicates that offering a non-free product is associated with lower downloads. In addition, price is insignificant in the regression, thus emphasising that downloads do not depend on price, while pointing out that the negative correlation between price and downloads in the first specification results from the uncontrolled association between paid and free software. Consequently, it is also suggested that the regressions in the first and second columns highlight the fact that consumers prefer free software.

Table 4.3 Regression results

Specification	(1)	(2)	(3)
Dependent Variable	Downloads	Downloads	Downloads
Paid Dummy		-1.7013***	-0.0583
		(0.3846)	(1.1243)

Table 4.3 (Continued)

Specification	(1)	(2)	(3)
Dependent Variable	**Downloads**	**Downloads**	**Downloads**
Critics' Reviews	0.2543***	0.2161**	0.3098*
	(0.0877)	(0.0863)	(0.1712)
Users' Reviews	0.2462**	0.2342**	0.4398**
	(0.0974)	(0.0963)	(0.1724)
Competition Measure	0.2263***	0.2092***	0.1983***
	(0.0323)	(0.0324)	(0.0505)
Advertising	3.0223***	3.1350***	-1.0733
	(0.1951)	(0.1961)	(0.8595)
Brand	0.5730***	0.5418***	0.8700***
	(0.1715)	(0.1696)	(0.2816)
Price	-0.3702***	0.0279	0.0468
	(0.0469)	(0.0885)	(0.0871)
Paid Dummy x Critics' Reviews			-0.3473*
			(0.1947)
Paid Dummy x Users' Reviews			0.0172
			(0.0607)
Paid Dummy x Competition Measure			-0.1043
			(0.1944)
Paid Dummy x Advertising			4.3954***
			(0.8768)
Paid Dummy x Brand			-0.6077*
			(0.3334)
Log (market size)	0.0262	0.0292	-0.0017
	(0.0861)	(0.0841)	(0.0831)
Constant	6.9217***	7.3853***	6.4265***
	(0.7628)	(0.7753)	(1.1537)
Observations	540	540	540
Adjusted R-squared	0.397	0.411	0.426

Table 4.3 (Continued)

Clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: compiled by the author

To test the hypotheses advanced in this research study, the final specification interacts with the paid product dummy with the interest variables listed above. These interaction terms will then measure the difference in the effect of the variables of research interest between paid and free software. Interesting and unique results summarized in Table. 4.4.

Table 4.4 Summary of findings

Hypothesis		Findings
H1	Advertising has a higher impact upon a product's revenue than its price (paid versus free software).	SUPPORTED
H2	The level of competition between companies offering the same product has a higher impact a product's revenue than its price (paid versus free software).	NOT SUPPORTED
H3	The brand has a higher impact upon a product's revenue than its price (paid versus free).	SUPPORTED
H4	Opinions of critics have a higher impact upon a product's revenue than its price (paid versus free).	NOT SUPPORTED
H5	Opinions of users have a higher impact upon a product's revenue than its price (paid versus free).	SUPPORTED

Source: Compiled by the author

It can be seen that higher users' reviews and branding are associated with more downloads for free products than paid products. In particular, the fact that a user's review for paid products is insignificant, while free software is associated with a (exp(0.44)-1)*100% = 55% increase for each increase in the user review.

It is argued that advertising appears to have an insignificant association with downloads of free software, while for paid software advertising suggests exp(4.3954)-1 = 80 times more downloads. Advertising has coefficients of 3.022 and 3.135 in specifications 1 and 2, respectively, while branding has coefficients of 0.573 and 0.542, respectively (see Table 4.2).

Finally, branding appears to attract customers to its free software, while discouraging consumers from purchasing the paid software. Branding is therefore associated with an (exp(0.87)-1)*100%=138% increase in downloads of free software, whereas branding a paid software results in an only (exp(0.87 – 0.61)-1)*100% = 30% increase in its downloads. The other two factors, namely, critics' opinions and downloads of the top competitor's product, equally contribute to free and paid software downloads, as evidenced by the statistically significant coefficients on the individual terms, while the terms which interacted with the paid dummy variable typically tend to remain insignificant.

4.5 Conclusion of the chapter

This empirical analysis shows that consumers generally prefer free products. In addition, a number of associations between various endogenous factors and downloads of software companies' products are revealed. It is turned out that users pay attention to all the possible alternatives for the solution of their applied problems by using one or another software product. In doing so, consumers may choose either the free software product, its paid analogue, or both. In line with numerous studies referred to in the second chapter, critics' reviews (see section 2.5.2.5) and assessments have a significant association with product download for both free and paid software. Users' reviews also show a positive relationship with the download rate of free and paid software. The factors with the largest positive associations with product downloads, of both free and paid software, are advertising and branding.

The factors of downloads of the e-commerce products are essential for strategy and marketing policies of companies which promote their products through the Internet. For example, the regression analysis makes it clear how much price or competition of a product affects the downloads and depending on its potential effect a company would choose optimal price and product in the context of competitors' products.

In this chapter we've established that consumers prefer free products and identified that factors that are most relevant to consumers' demand function. The next logical question then is what companies can do in order to maximize their revenue taking these consumer preferences into account. Thus, the following chapter presents a methodology to asses an e-commerce firm's product policy strategy by reviewing their product portfolio, as established in the firm's information technology knowledge and applied the results obtained considering companies policies aimed to boost their sales and profits.

CHAPTER 5. 2nd STUDY: AN ASSESSMENT OF PRODUCT POLICY OF E-COMMERCE COMPANIES

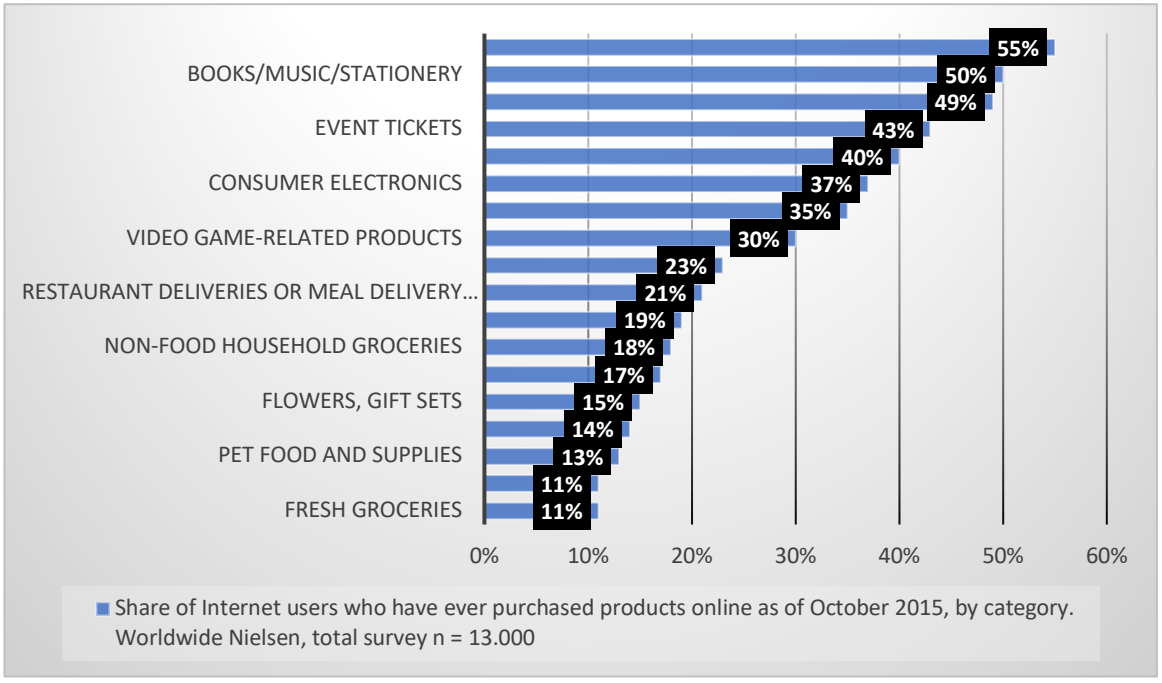
In the chapter that follows, a method of assessing the product strategy for e-commerce firms by analysing their portfolio of products, founded in informativity, has been created. During the process of empirical study, online agents selling mostly perfect products of e-commerce and products shown to stimulate demand within the virtual marketplace are shown to experience decreased transaction costs versus online sellers that offer products that are more reflective of the traditional marketplace and not shown to stimulate demand. The novelty, scientifically, of this method, thereby lies within the improvement of the procedural apparatus for marketing e-commerce firms, and for researching upon the internet markets.

An overview is provided of several empirical studies with the goal of praising the procedural support innovatively created by the author for the evaluation of e-commerce firms' policy regarding products. This is done through the examination of a selected group of e-commerce firms based in Germany.

5.1 Established empirical literature of the product structure of the global Internet market

Before discussing the development of the methodological support in assessing product policy of e-commerce companies, a number of empirical studies of the product structure of the global Internet market would need to be considered. A review of a published sociological survey regarding consumer Internet purchasing patterns was performed. The data reviewed did not encompass all products purchased online but left out obsolete categories. However, it did provide valuable data regarding categories of products which are frequently purchased via online channels. In 2016, Nielsen Company issued the online publication of the results of a 2015 sociological survey within the scope of which respondents answered the question related to types of products preferred while purchasing on the Internet (Figure 5.1).

Figure 5.1 Consumer Preferences on the global Internet market in 2015



Source: Nielsen Company (2015)

According to the data presented in Figure 5.1, fashion-related products, books/ music/stationery, coupled with consumer electronics and video game-related products, are the most popular Internet-

available products among consumers. Yet, this sampling does not include CD or DVD products, which can be clearly explained by the fact that technologies of recording CDs or DVDs are no longer up to date, while consumers have generally switched to direct downloading of information products (software, movies) from the websites of Internet-based companies (Reis, 2014). In addition, firms also offer digital library services or content such as movies and music which is consumed online (Knight & Hollar, 2009).

In a 2015 research study carried by A.T. Kearney Company, a slightly different situation is demonstrated, as shown in Figure 5.2. As illustrated in the following figure, the percentage of respondents who have purchased the specified products via the Internet during the last three months is higher, which indicates that books, electronics and fashion-related items are the most purchased Internet products, with groceries ranking the lowest in purchase percentage. However, this sampling does not include CD or DVD products, since their sales figures are merged, mainly due to the fact that nowadays most consumers prefer downloading information products, such as movies or software, directly from companies' websites, thus essentially making the acquisition of a relevant sample group a rather difficult task.

The global average for online electronic purchases is estimated at 77 percent. Germany is the second leading country on online electronic purchases with a 90 percent purchase rate, after China, where a 96 percent purchase rate has been noted. According to Figure 5.2., Germany is also second in the online purchase of fashion and apparel, a product category that is the second most preferred on the global Internet market. Furthermore, the figure reveals that Germany is third in the consumption of books as well as online services on the global Internet market. Coupled together, these figures indicate that the online consumption of various product categories in the global market represents a cumulative characteristic of market situations in different countries, where consumer preferences vary significantly.

Figure 5.2 Consumer preferences on the global Internet market in 2015

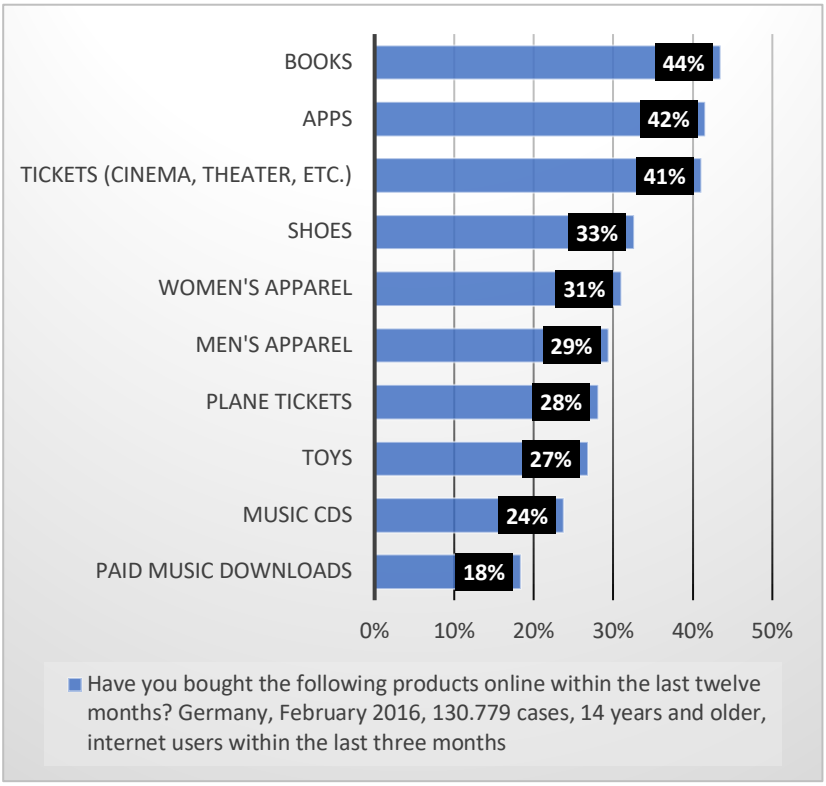
	Global average	United States	United Kingdom	Germany	Japan	India	Brazil	Russia	China	South Africa	Nigeria
Electronics	77%	83%	84%	90%	53%	79%	86%	71%	96%	60%	65%
Home appliances	59%	46%	65%	58%	41%	67%	70%	62%	83%	41%	52%
Home furnishings	53%	56%	65%	66%	53%	59%	48%	43%	65%	34%	30%
Fashion and apparel	76%	87%	85%	88%	66%	84%	75%	64%	97%	47%	65%
Sports and outdoor	52%	56%	53%	66%	36%	52%	49%	51%	78%	35%	35%
Beauty products	57%	50%	56%	62%	48%	68%	59%	53%	85%	41%	45%
Household items	45%	36%	48%	40%	41%	60%	35%	36%	84%	31%	35%
Groceries	45%	26%	60%	36%	68%	52%	29%	31%	90%	31%	30%
Toys, kids, and babies	49%	48%	53%	49%	32%	61%	47%	44%	75%	38%	34%
Tickets	64%	74%	69%	63%	43%	79%	65%	51%	71%	69%	47%
Music and games	62%	74%	75%	66%	46%	65%	62%	43%	69%	64%	57%
Books	73%	82%	82%	80%	65%	70%	75%	52%	89%	64%	71%
Services	76%	80%	76%	77%	63%	82%	70%	63%	87%	79%	80%

>75% have bought the category online 50%-75% have bought the category online <50% have bought the category online

Source: A.T. Kearney (2015, p. 6)

Whereas Figure 5.2 above signposts high online consumption preference in the electronic product category among Germans, the actual market situation is slightly different in Germany, since issues related to transaction costs and delivery options discourage Germans from buying expensive items such as electronics online. According to AGOF Company, German consumers purchase books, software, and footwear via the Internet, to a greater extent, as illustrated below (Figure 5.3).

Figure 5.3 German Consumers' preferences on the Internet market in 2016



Source: AGOF (2016)

As it can be noted, the peculiarity of the Internet market in Germany is that specific product categories, such as games and electronics, are practically absent. Nevertheless, the category of books ranks the first as compared with the global Internet market, and the reason for this is the strong reading culture found in Germany, which begins from an early age, coupled with the adoption of the e-book format by the publishing industry which has proven to be popular in the country (Börsenverein des Deutschen Buchhandels e.V., 2013). This is firstly due to the fact that control of copyrights and the mechanisms of protection of intellectual property on the Internet are sufficiently appropriate in (AGOF, 2016). Further research will primarily rely on the empirical basis of research on the global Internet market. In the following sections, it will be attempted to answer several questions pertaining to the global market as related to why one product is more successful on the Internet, and why another product almost fails; and also, the issues of what products impose higher transaction costs and what products impose lower transaction costs on the sellers when sold via the Internet would be addressed. To understand these particular aspects, first, the following sections provide an overview of how products may be classified, according to the possibility of selling them via the Internet.

5.2 State and trends in the development of e-commerce companies in Germany

Since the empirical analysis is based on German companies, attention should be paid to a series of trends and prospects for development of the Internet market in Germany. According to the developed typology of institutions of the e-commerce market (see section 3.1.1), the types of institutions of the Internet market currently in play in Germany are described in Table 5.1.

Table 5.1 Institutions of the Internet market in Germany

Name	Category of Institution	Main Functions	Website
Bundesministerium für Verkehr und digitale Infrastruktur	Institutions of external regulation, control, and statistics	Legal and regulatory framework as well as formulation and implementation of a state policy with regard to information technologies, telecommunications, public communications and mass media, which includes electronic sources (inclusive of the development of the Internet), and as related to new technologies in these fields	https://www.bmvi.de Accessed: Dec 12th, 2018

Table 5.1 (Continued)

Name	Category of Institution	Main Functions	Website
Bundesnetzagentur	Institutions of external regulation, control, and statistics	The federal executive authority responsible for rendering governmental services in the areas of mass media and public communications, inclusive of the Internet; licensing of providers and registration of Internet-based mass media; coordinating authority which regulates the use of the radio-frequency spectrum (required for the development of mobile Internet) and is responsible for the formulation of the state policy concerning the allocation and use of the spectrum	https://www.bundesnetzagentur.de *Accessed:* Dec 12th, 2018
Bundesministerium des Innern	Institutions of external regulation, control, and statistics	The federal executive authority which exercises functions involving control and supervision in the areas of mass media and the Internet	https://www.bmi.bund.de *Accessed:* Dec 12th, 2018

Table 5.1 (Continued)

Name	Category of Institution	Main Functions	Website
The Software Alliance (BSA) non-profit institution	Institutions of external regulation, control, and statistics	Supporting the development of secure and legal digital environments: the protection of copyright and anti-piracy campaign, security of the information space, supporting the development of innovations in the field of high technologies	https://www.bsa.org *Accessed:* Dec 12th, 2018
International Intellectual Property Alliance (IIPA)	Institutions of external regulation, control, and statistics	Protection of copyright and intellectual property rights, anti-piracy campaign	https://iipa.org *Accessed:* Dec 12th, 2018
Internet Corporation for Assigned Names and Numbers (ICANN)	Institutions of B2B communication	Exercising IANA functions (Internet Assigned Numbers Authority): management and control of spaces of IP addresses and top-level domains; registration of MIME data types	https://www.icann.org *Accessed:* Dec 12th, 2018
International Telecommunication Union (ITU)	Institutions of B2B communication	The United Nations agency specialised in information and communication technologies which allocate global radio-frequency spectrum and satellite orbits, and in the development of technical standards	https://www.itu.int *Accessed:* Dec 12th, 2018

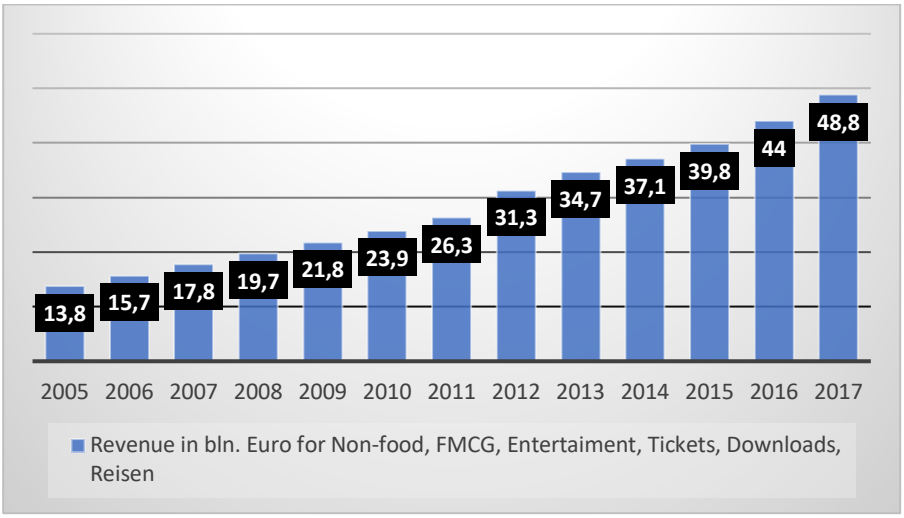
Table 5.1 (Continued)

Name	Category of Institution	Main Functions	Website
DENIC eG	Institutions of B2B communication	The central registry of all the domains with .de country code.	https://www.denic.de *Accessed:* Dec 12th, 2018
Digital Analytics Association	Institutions of B2C communication	Introduction of generally accepted standards according to which measurements can be taken and depending on which web analytics may be carried out; membership in the association entitles the establishment of standards in the area of tracking web data for Internet advertising	https://www.digitalanalyticsassociation.org *Accessed:* Dec 12th, 2018
Bundesverband E-Commerce und Versandhandel Deutschland	Institutions of B2C communication	Supporting the development of the e-commerce market in Germany and helps to increase the number of *bona fide* sellers as well as to improve attitudes towards the branch on the part of the society, mass media and government authorities	https://www.bevh.org *Accessed:* Dec 12th, 2018
Verband Deutscher Zeitschriftenverleger e.V. (VDZ)	Institutions of B2C communication	Association of manufacturers and publishers of network content	https://www.vdz.de *Accessed:* Dec 12th, 2018

Source: compiled by author by using Google Search (www.google.de)

If the dynamics of development of the Internet market is addressed, it can be stated that the dynamics of growth which characterises the market in Germany will remain positive. According to experts in the field of digital economics, the growth of the Internet market will continue into the foreseeable short future (Figure 5.4), as illustrated by results registered in 2016, when the e-commerce market of Germany amounted to 44 bn. Euro, as compared to the average growth of the market of 11% in 2005-2016, and which had been expected at the level of 11% per annum in 2017-2018.

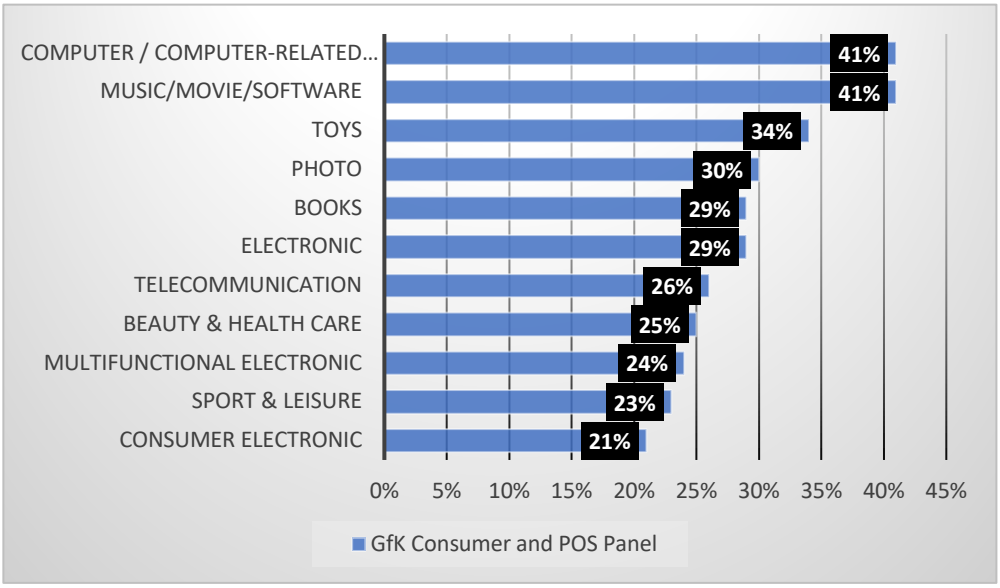
Figure 5.4 Volume of e-commerce market between 2005 and 2017 in billion Euros



Source: Handelsverband Deutschland (2017b)

As illustrated in the graph above, taken from data made available by Handelsverband Deutschland (2017b), it was in 2016 that the most significant market share fell on online shops engaged in the selling of electronics and of either music, movies or software. Besides, considerable market shares belong to companies which are by nature of the Internet-based hypermarkets type as well as to online shops engaged in the selling of toys, household appliances, books, beauty products and also of sports and leisure products (Figure 5.5).

Figure 5.5 Forecast of shares of market segments within the general framework of the Internet market



Source: Handelsverband Deutschland (2017a)

Experts have distinguished and theorised the following main trends in the development of the Internet market in Germany, including (Doplbauer, 2015):

- the development of multi-channel sales strategy: the most significant players develop retail chains at the same time as the Internet market continues to develop;
- showing up for consolidation of specific segments: mergers and acquisitions of significant players take place;
- the development of mobile applications on the Internet market;
- the expansion of mobile advertising via the utilisation of online shops is observed;
- the development of mobile payment resources is enhanced;
- the marketplace business model becomes more attractive: aggregation of information about online shops on a single portal;
- hypercompetition occurs in specific segments of the Internet market: a large number of players are present in the market segments of home appliances and electronics, apparel,

and footwear, food or meals delivery, which is due to low barriers to entry (Porter, M., 1998) and popularity of the segments with consumers;

- the share of e-books in the product structure of the segment of books and multimedia has been gradually increasing;
- certain segments, such as software and healthcare, depend on external factors: in the former case, the share of illegal content is significant, while in the latter case, dependent on government control and branch regulation.

As illustrated in the description of the trends listed above, competition within the Internet market in Germany has been increasing quite significantly and thus has become quite fierce. Consequently, the most attractive segments of the Internet market tend to be engaged with the selling of products that pertain to the categories of perfect e-commerce products and of products that enhance demand, according to the classification developed by the author. This further necessitates the drive to explore the various factors of marketing and product policy that help drive demand for their products.

The next part of the present research study will be devoted to addressing the issue of why specific characteristics of products impact upon the level of sales registered by e-commerce companies as well as upon how companies gain and maintain their competitive advantage on the Internet market.

5.3 Assessment of e-commerce companies' product policy by information content of product portfolio

5.3.1 Method

To further evaluate how specific characteristics of products affect a firm's revenue, a number of factors of non-price competition affecting a firm's revenue are assessed. To this end, the evaluation of the effectiveness of implementation of the product policy of e-commerce companies is divided into the following stages:

Stage 1 – Collect information about e-commerce companies' products. This stage identifies which products are sold by online agents, in addition to distinguishing among the product's characteristics. To

capture nuances differentiating companies' practices and products, the present research study collected information about large federal online shops and their product portfolio.

Stage 2 – Collect firms' financial data. This stage involves evaluating the sampled organisations' financial performance by looking at financial reports and collecting data on performance, including gross and net revenue and profit. Since several e-commerce companies also have a non-online aspect to their business, say from sales from brick and mortar stores, this analysis is restricted to pure e-commerce companies who conduct 100% of their business online so as to focus exclusively on the online aspect of their marketing, sales.

Stage 3 – Collect marginal cost data. At this stage, the data and analysis draw upon sampled e-companies' financial performance statements, with the aim of identifying variables in production costs. Consequently, variable costs for the e-commerce companies sampled in the present research analysis may include the packaging of products, in the case of finished products warehouses; the delivery of products to shipment terminals; the payment for services of middleman organisations engaged in sales of the finished products; the maintenance of the facilities for storage of products at the points of sale; payment for the labour of salespersons; expenses for marketing research; and petty cash, among other expenses. Variable costs in the e-commerce industry also necessarily include 'search expenses,' which comprise any costs incurred by the firm to raise awareness of and market their product(s).

Stage 4 – Regression analysis. Regression analysis to the collected data is applied in order to determine relevant associations between various product factors and profit, while controlling for additional factors which affect the functions of firms' profits. As a result of the consolidation and analysis of the acquired data, the following groupings regarding the effectiveness of e-commerce company will be used as formulated in section 3.4:

1. The company is a perfect e-commerce company (**1st Category**). The company gains the highest possible income in the current conditions and has the optimal level of transaction costs; the company's website is characterised by high traffic, great link popularity in the leading search engines as well as a significant number of mainly positive reviews; therefore, the company has an optimal product portfolio consisting of only perfect e-commerce products.

2. The company is a highly-effective e-commerce company (**2nd Category**). The company gains sufficiently high-income possible under the current conditions and has near optimal level of transaction

costs; the website of the company is characterised by high traffic, satisfactory link popularity in the leading search engines and a high number of reviews of various nature; the company sells mainly perfect e-commerce products which stimulate consumer demand; as a result, the product portfolio of the company is balanced.

3. The company is a low-effective e-commerce company (**3rd Category**). The difference between the gross income and the net income of the company is great; the company's transaction costs are high; the company's website is characterised by low traffic, low link popularity in the leading search engines and a small number of reviews, mainly negative; the company sells mainly products which do not stimulate the consumer demand, all of which render its product portfolio low-effective.

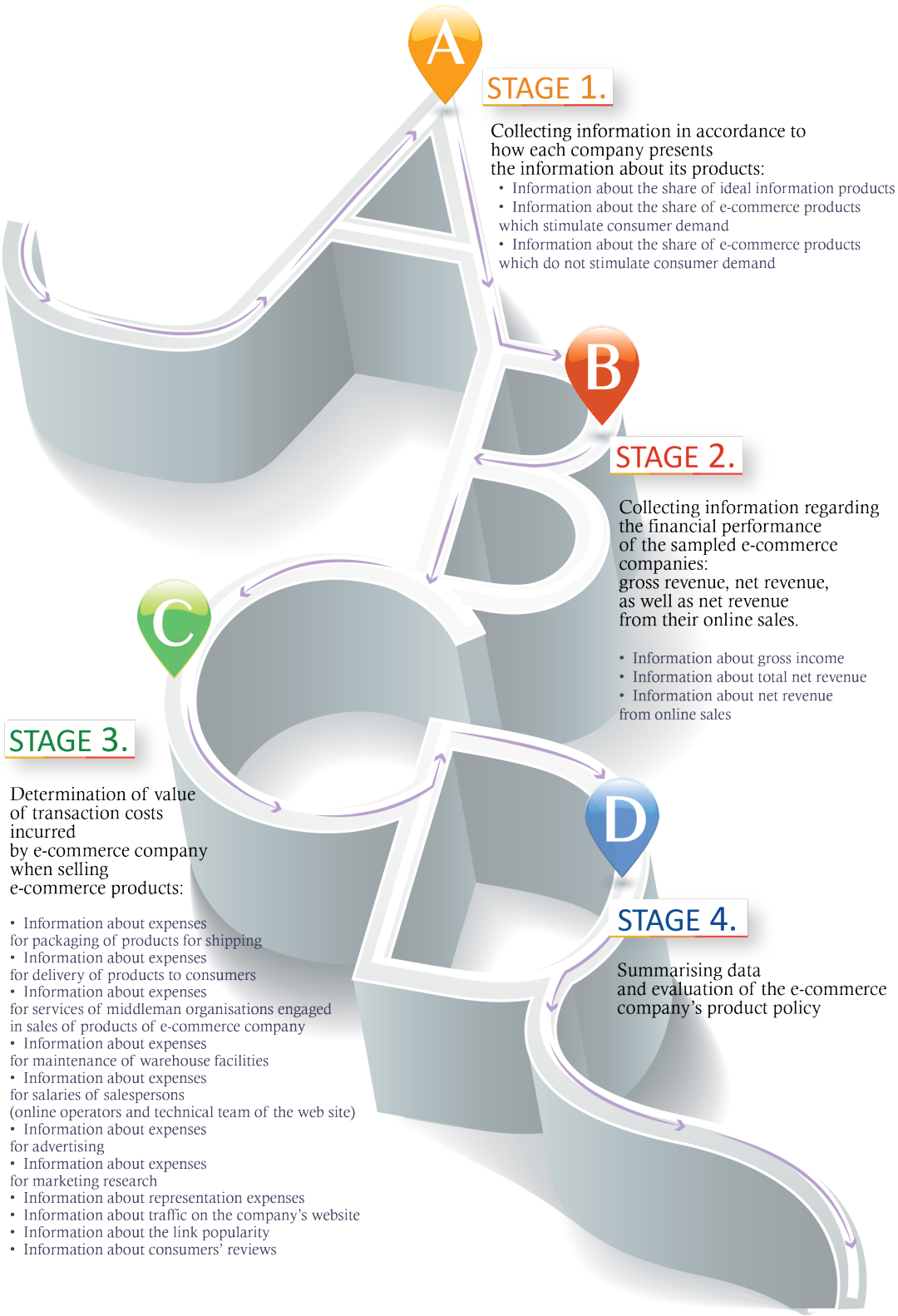
As an illustration of this, Figure 5.6 overviews the four stages of the data analysis procedure. The developed technique presents a number of advantages. Most importantly, it enables the evaluation of the effectiveness of how e-commerce companies have implemented their product policy, based on the main financial indicators as well as on an analysis of the company's website. This technique, in particular, comprises not only the traditional methods of analysis, but also state-of-the-art tools of web analytics.

Drawing upon the theoretical assumptions outlined in the section 3.4 of this research study as well as upon a law of economics, a company is known to be able to maximise its profit mainly when it produces a quantity in a such way that marginal costs equals marginal revenue. Thus, the following main hypothesis (H6) was formulated in the section 3.4 and will be tested in this study:

H6: A perfect e-commerce company (1st Category) and a highly-effective e-commerce company (2nd Category) have optimal levels of transaction costs.

These optimal levels of transaction costs are thus the levels such that a firm's marginal costs equal its marginal revenue. Now that the hypothesis and the method for the empirical analysis has been established, the study begins with stage 1 with the data collection process regarding firm characteristics and proceeds to stages 2-4. The following section thus describes the stage 1 data collection process implemented for the present research analysis.

Figure 5.6 Data methodology



Source: compiled by the author

5.3.2 Data

To capture the nuances among companies' practices, information about large federal online shops has been obtained. The data includes an assortment of products sold by such online shops, as well as consolidated profit and loss statements over several years, which includes information on the gross profit and business expenses of the companies, and which, in turn, enables an evaluation of the level of transaction costs. Besides, information characterising the websites of such shops has been gathered.

As seen in Figure 5.6, what is to be done is to gather information three types of information and their proper use in the analysis. It is claimed that information should be collected as related to the shares of ideal information products, and e-commerce products which induce and do not induce consumer demand; information about gross revenue, total net revenue, and net revenue from online sales; and information about various transaction costs related to selling e-commerce products. The information to be collected and analysed in the stages outlined in Figure 5.6 concerns nine companies. Additionally, Table 5.2 overviews the companies which the present research study focuses on, including the gathered information. Because most of e-commerce companies do not publish all data but instead provide economical results based on International Financial Reporting Standards (IFRS) or German Generally Accepted Accounting Principles (GAAP), it is essential to note that information about revenue, product portfolio, and other aspects may be acquired by directly contacting and requesting permission from the researched companies. Under these circumstances, the present research study collected data from German e-commerce companies which agreed to disclose and provide data and to participate in this research.

Table 5.2 E-commerce companies selected for research

Company #	Legal Entity	Years Data Available
1	S.à r.l.	2003-2016
2	GmbH	2007-2016
3	GmbH	2004-2016
4	GmbH & Co. KG	2005-2016

Table 5.2 (Continued)

Company #	Legal Entity	Years Data Available
5	OHG	2004-2016
6	GmbH	2004-2016
7	GmbH + Co KG	2005-2016
8	SE	2004-2016
9	GmbH	2005-2016

Source: compiled by the author based on the collected data

Overall, the data covers the period between 2003 and 2016, and is applicable to the above-listed listed 9 companies, with a total of 112 usable financial and 323 product portfolio observations. The attributes along with their descriptions are provided in Table 5.3.

Table 5.3 Structure of research database of 2nd study

Variable	Variable Description
Log Net Profit	The logarithm of net profit at the company level. It is equal to the difference between a company's gross profit and production and transaction costs.
Log Transaction Cost	The logarithm of transaction costs at the company level. Their types are summarized in Figure 3.3.
Company dummies	Binary variables for nine companies in the dataset which equal to unity for a specific company and zero otherwise.
Year dummies	Binary variables for years 2003-2016 which equal to unity for a specific year and zero otherwise.
Interactions of company dummies and log transaction cost	Each variable is a product of log transaction cost and the dummy for a company, which measures the difference in the effect of transaction cost between this company and the reference company (the ninth).

Source: Compiled by the author

According to the gathered data, the online shops under research can be categorised as listed in Table 5.4, based on the fact that they tend to sell mainly the following types of products.

Table 5.4 Product categories

Perfect e-commerce products	Imperfect e-commerce products which stimulate consumer demand	Strongly imperfect e-commerce
1. Software (hard copy and available online for download) 2. Movies (hard copy and available online for download) 3. Music (hard copy and available online for download) 4. Books (hard copy and electronic format, audio books) 5. Games (e.g. stuffed toys, table-top and learning games, game supplies, non-digital)	1. Automobile products 2. Pet supplies 3. Sporting products 4. Apparel and footwear 5. Baby and children products (e.g. babyphones, babywalkers, playpens, school supplies) 6. Household appliances and electronics 7. Household products (e.g. furniture, setting and decorative components for the interior design, homeware) 8. Tools (electric and hand-guided) 9. Telephone equipment and associated products 10. Photography and video equipment 11. Computer hardware and digital equipment 12. Network equipment	1. Perfumery 2. Beauty products

Source: compiled by the author

Based on informativity, a distribution of products by categories has been carried out, in accordance with the theoretical model described in section 3.2 of this research study. If the percentage ratio of products is considered in terms of informativity, the results included in Table 5.5 are obtained. The share of products has been calculated by counting of the number of product names in the respective categories which are available in the shopping catalogues of online shops. Further information about product portfolios of the online shops under research is provided and included in Appendix A.

Table 5.5 Shares of products, based on informativity

Company #	Total	Total of perfect products	Share	Total of imperfect products	Share	Total of strongly imperfect products	Share
1	59929303	11512490	19%	40791534	68%	7625279	13%
2	24542	2440	10%	0	0%	22102	90%
3	18474	13419	73%	5055	27%	0	0%
4	1148238	2149	0%	1146089	100%	0	0%
5	28812	4939	17%	250	1%	23623	82%
6	5467	2235	41%	27	0%	3205	59%
7	4629	1181	26%	0	0%	3448	74%
8	85152	70397	83%	12435	15%	2320	3%
9	4536	4392	97%	144	3%	0	0%

Source: compiled by the author based on the available data from researched companies

Tables 5.6 and 5.7 below give evidence that company #9 is the best online store in terms of information, which is also supported by the fact that the percentage of perfect information products in the portfolio is 97%. Therefore, the analysis of this shop constitutes the starting point for the subsequent study of the other companies. Aggregated financial indicators obtained from the consolidated financial results of the company are presented in Table 5.6 below.

Table 5.6 Company #9 Financial Indicators (in Euro)

N	Year	Net Profit	Transaction Costs
1	2004	2,906,304	2,563,255
2	2005	4,250,458	4,064,826
3	2006	4,142,224	3,999,334

Table 5.6 (Continued)

N	Year	Net Profit	Transaction Costs
4	2007	4,609,386	4,286,467
5	2008	4,702,658	4,053,269
6	2009	7,116,804	6,553,596
7	2010	6,177,891	5,817,824
8	2011	8,044,324	7,032,408
9	2012	8,490,111	8,108,751
10	2013	12,421,921	10,351,290
11	2014	8,467,470	7,255,973
12	2015	9,587,687	7,975,463
13	2016	13,700,640	12,255,559

Source: compiled by the author, based on the available data

In addition to outlining the structure of the database, Table 5.7 indicates that company #9 average net profit is very similar to its transaction costs, both of which also have comparable standard deviations. The fact that the Pearson correlation for these two variables is 0.99 is viewed as additional evidence that these variables should be treated as size-related company characteristics. Compared with other companies included in the sample, company #9 is a relatively small company which is seen in its smaller total profits and transaction costs.

Table 5.7 E-commerce Firms' Summary Statistics

	Company #9			All companies		
Variables	**N**	**Mean**	**St. Dev.**	**N**	**Mean**	**St. Dev.**
Net Profit	13	7,278,298	3,286,552	112	353,996,372	851,174,122
Transaction Costs	13	6,486,001	2,778,072	112	298,815,722	714,656,605

At this stage, it is appropriate to select from the online shops under research only those shops which, on the one hand, sell products of the respective category in larger volume than the others and, on the other hand, in respect of which there is financial information available for quite an extended period. As shown in Table 5.5, all online shops are appropriate. Financial indicators (in Euro) of these online shops are given in Appendix B.

5.3.3 Empirical specification

Basic economic theory suggests that a profit-maximizing firm will operate such that their marginal costs equal their marginal revenue. To find this equilibrium, one can solve the first order condition setting marginal costs equal to marginal revenue. Solving the first order condition of the profit maximization problem whereby marginal costs equals marginal revenue yields the following dependence below, as a result of theoretical research, the author obtained previously in the section 3.4 (equation 3.21):

$$\frac{\partial \mathrm{NP}}{\partial \mathrm{TC}} \times \frac{\mathrm{TC}}{\mathrm{NP}} = 1$$

where:

NP – net profit;

TC – transaction costs.

Taking logs of respective variables, the following econometric model is suggested, as indicated below:

$$\log(\mathrm{NP}_{\mathrm{it}}) = \beta_0 + \beta_1 \log(\mathrm{TC}_{\mathrm{it}}) + \varepsilon_{\mathrm{it}} \quad (5.1)$$

where:

NP – net profit;

TC – transaction costs;

β – coefficient of interest.

The coefficient of interest β_1 measures the efficiency of the companies in terms of their relative transaction costs. The companies of the first and second types should show this coefficient about unity. In the next part of this research study, the main results of the data analysis are presented.

5.3.4 Review of findings

A more formal regression analysis may also be obtained by focusing on company #9. Since the dependent and independent have a skewed distribution, log transformations of the variables are used in the regression analysis to normalize the distribution and help eliminate any potential heteroscedasticity.

The variable of gross profit is used as a proxy for net profit. Since the analysis is working with time series data, a unit root is tested for. A Dickey-Fuller test for the logs of NP and TC yields p-values of 0.67 and 0.59, implying that the null of a unit root cannot be rejected and thus that a usual regression could be spurious. However, the time-series might be trend-stationary, so when a time trend is included in the test, the resulting p-values are 0.009 and 0.003, allowing us to reject that existence of a unit root. Furthermore, to avoid an incorrect estimate caused by a spurious regression, a trend variable (year) as control would need to be used. Table 5.8 presents the estimation results.

Table 5.8 Elasticity of NP with respect to TC for particular companies

	(1) Company #9	(2) Company #6	(3) Company #8
Log TC	0.8733***	0.4483***	-0.2723
	(0.0846)	(0.1184)	(0.2345)
Year	0.0204**	-0.0188**	0.0411**
	(0.0071)	(0.0081)	(0.0131)
Observations	13	13	12
R-squared	0.9924	0.7178	0.6696
p-value of F-test of equality of the coefficient to unity	0.165	0.000896	0.000419

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: compiled by the author

It can be noted that the estimate of 0.87 is not far from 1, thus indicating that the empirical tests support the claim that it is close to being perfectly profit maximising. The F-test for the equality of this

estimate to 1 suggests that this hypothesis cannot be rejected on every conventional confidence level. The conclusion is that, according to the theory that efficient companies will set their marginal costs equal to marginal revenue, company #9 indeed is the *most efficient* company in the sample used in the present research study, since it is closest to reaching the optimal ratio of marginal revenue equalling marginal cost.

For the sake of comparison, the same regressions are also run for companies which should do not exhibit behaviour in line with the proposed main hypothesis, namely, for company #6 and company #8. The results are presented in columns 2 and 3 of Table 5.8.

Since company specific factors could be biasing the results obtained in the present research study, the initial regression specification is supplemented by company fixed effects so as to control for these time-constant company characteristics. Thus, the full sample of the nine firms is examined over 12-13 years rather than run firm-specific regressions. In addition, using the full panel data allows to control for time-specific effects with year-fixed effects.

To check the difference between the companies in terms of elasticity of with respect to transaction costs, the firm dummies are interacted with their logged transaction costs. As a result, company #9 is excluded from the firm dummies, and hence the interaction terms are used in order to compare the remaining companies with this one in terms of elasticity. Therefore, the following specification is proposed:

$$\log(\mathrm{NP})_{it} = a\log(\mathrm{TC})_{it} + \sum_{j=2004}^{2016} b_j \mathrm{year}_j + \sum_{k=1}^{8} b_k \mathrm{company}_k \log(\mathrm{TC})_{it} + \sum_{l=1}^{9} b_l \mathrm{company}_l + u_{it} \quad (5.2)$$

Table 5.9 presents the regression results. The coefficient on log TC indicates that the NP-TC elasticity for company #9, after controlling for year- and firm-fixed effects, is 1.08. It is readily seen that this coefficient is different from unity by the standard error. Consequently, the hypothesis that the coefficient equals to unity can be tested. The F-test of equality to the unity of this coefficient has a p-value of 0.3, meaning that the null of unity for this coefficient cannot be rejected as before. Thus, this result is in line with the hypothesis that in an efficient equilibrium a profit-maximizing company operates at the level such that its marginal costs equal its marginal revenue.

Table 5.9 Estimation results

	log NP
log TC	1.0813***
	(0.0813)
2004 Dummy	0.2373**
	(0.0838)
2005 Dummy	0.1747***
	(0.0519)
2006 Dummy	0.1932***
	(0.0496)
2007 Dummy	0.2328**
	(0.0731)
2008 Dummy	0.2508***
	(0.0705)
2009 Dummy	0.2008**
	(0.0661)
2010 Dummy	0.1344*
	(0.0670)
2011 Dummy	0.1679*
	(0.0842)
2012 Dummy	0.1578
	(0.0951)
2013 Dummy	0.2033*
	(0.0924)
2014 Dummy	0.2176*
	(0.0948)
2015 Dummy	0.1437
	(0.1033)

Table 5.9 (Continued)

	log NP
2016 Dummy	0.1714
	(0.0965)
1.id#c.log TC	-0.1195*
	(0.0564)
2.id#c.log TC	-0.0154
	(0.0645)
3.id#c.log TC	-0.0817***
	(0.0196)
4.id#c.log TC	-0.0607
	(0.0975)
5.id#c.log TC	-0.6599***
	(0.1125)
6.id#c.log TC	-0.0717
	(0.0604)
7.id#c.log TC	-0.0864
	(0.0815)
8.id#c.log TC	-0.7071***
	(0.0837)
Observations	112
Number of id	9
R-squared adj	0.979
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Source: compiled by the author

As outlined in the above, the interaction terms therefore indicate that companies #1, #2, #3 and #4, all also perform in line with the hypothesis. For them, F-tests for equality of the main coefficient with

their respective added interaction terms indicate that the null hypothesis of unity cannot be rejected. As these companies are among those with right policies, this result is in line with the advanced hypothesis.

It is concluded that, among other companies, two companies, company #5 and company #8, significantly differ from company #9 in terms of the NP-TC elasticity, as their elasticities are 0.374 and 0.421, respectively. Since these companies differ from the others in terms of their management, the profit maximisation hypothesis proposed in this subsection is supported by these results. However, company #6 and company #7 show results which are statistically indifferent from those for companies #1, #2, #3, #4 and #9, as related to the NP-TC link. For them, respective F-tests do not allow to reject the null of unity. It is worth noting that the obtained results may be interpreted in terms of the fact that the elasticity of gross profits by transaction costs is only a first approximation because actual data for gross profits is used, while the tested result is stated for gross profits net of production costs.

The main hypothesis which this subsection proposes is based on the fundamental economic rule that efficient firms should exhibit marginal revenue to marginal cost unity, while inefficient companies would exhibit ratios that did not equal one. It is thus considered that this rule is applied to transaction costs of nine companies among which there are five companies with effective policies and four companies with inefficient policies. Those with the effective policies should show NP-TC elasticity of unity, while inefficient companies are to show different values of the same indicator. In line with the hypothesis, the efficient use of transaction costs is seen in five companies with proper policies, while two companies with improper policies do not show the efficient use of transaction costs. Regressions with the use both time-series for those companies and panel data for all the companies lead to results according to which this company features an optimal NP-TC link, which is entirely in line with the suggested main hypothesis. The other efficient companies present similar results in respective time-series and panel specifications.

Among the selected inefficient companies, there are two which have led to dramatically different results as compared with the efficient companies with respect to the NP-TC link. One of them does not show a statistically significant coefficient for log TC, thus indicating that this company's gross profit does not depend on its transaction costs. In other words, although this company spends its resources, it fails to see the results. Conversely, another company shows a very low coefficient. In both cases, it is concluded that the companies do not get enough pay-off from their transaction costs, so that the latter, at least in part, make up for their losses.

A slightly unexpected result is that the two companies among inefficient, company #6 and company #7, do not statistically differ from the efficient ones with respect to NP-TC link. However, upon checking the efficiency indicators for these firms, it is claimed that they perform better than the other two inefficient companies. Their totals and share of products which do not induce consumer demands are lower than the same figures for the other inefficient companies. At the same time, their share of perfect products is higher than the respective figures for the other inefficient companies and even for two efficient figures. For example, company #1 and company #4 entering the group of efficient companies have the shares of perfect products of 0.19 and 0, while company #6 and company #7 have these shares of 0.41 and 0.26. Thus, the two companies are integrated among inefficient companies which feature the NP-TC link in line with the hypothesis and also turn out to enforce better policies in certain respects, compared with both the other inefficient and even a number of efficient companies. In conclusion, it is noted that the main hypothesis is supported, and also subsequently that the NP-TC link may serve as a reliable indicator of total quality management.

5.4 Conclusion of the chapter

In the fifth chapter, an analysis of the data on the current state and trends of development of the Internet market in Germany has been foregrounded. A technique of assessment of the product policy of e-commerce companies by means of analysis of the product portfolio, based on informativity, has been developed. In the course of the empirical study, the following hypothesis has been proven, namely, that: online agents which sell mainly perfect e-commerce products or products which stimulate demand on the virtual market incur lower transaction costs than online sellers which sell products which do not stimulate demand and are essentially products of the traditional market. The scientific novelty of this technique thus lies in the enhancement of the methodological apparatus for research on the virtual markets and the marketing of e-commerce companies, in particular.

The dependence between the sales levels and the factors of the competition of information products with zero and non-zero price under the conditions of the virtual market has been determined. The novelty of the determined dependence lies in the development of theoretical and applied model which describes marketing interaction of economic agents in the hyperspace.

In conclusion, the fifth chapter has overviewed a number of empirical studies aimed at an approbation of the methodological support which has been innovatively developed by the author for an assessment of e-commerce companies' product policy through an analysis of a selection of German e-commerce companies. The next chapter of the present research study will subsequently address a number of implications of these findings, summarise the main areas covered, and propose several suggestions for further research.

CHAPTER 6. CONCLUSIONS, IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

This thesis has documented the research undertaken to expand current knowledge and understanding of the assessment of product policy in the marketing of e-commerce companies. As pointed out in the literature review, it is clear that several current descriptions of the assessment of product policy in the marketing of e-commerce companies may be considered inadequate. Conversely, the present research study has identified context-specific aspects relevant to an effective assessment of e-commerce companies' product policies. The study has contributed to the literature and answers new questions by using an empirical analysis to quantify the amount that each factor contributes to a product's revenue. Using these findings, firms can shift their focus away from fields with little impact on revenue and towards fields or factors that significantly increase product revenue. Therefore, this chapter identifies and outlines key conclusions drawn as a result of the conducted doctoral research, and then details its own contribution to knowledge on the topic. To this end, a critical review of the study follows, including a number of implications for theory and practice. The chapter concludes by identifying potential directions for future research in this area.

6.1 Conclusions

This conclusion highlights the findings from this theoretical and empirical research assessing product policies employed by e-commerce companies. Based on a review of several research studies on the issue of development of contemporary social and economic relations accompanied by the omnipresent information and communication technologies, inclusive of the Internet-based technologies, the issue of the development of economic relations in the virtual environment remains one of the main issues which should be prioritised in contemporary scholarly studies on e-commerce, and, more broadly, on business (Arvidsson & Colleoni, 2012; Ceulemans & Fauconnier, 2015; Sparks, 2007; Webster, 2006).

Various approaches to the description of the arrangement of the contemporary society have been examined. This research study has thus adopted the definition of contemporary trends in the current development of society as information society to be understood as a social and economic system in which products of immaterial labour (e.g. information, knowledge and information services) constitute the primary objective of an economic activity, whereas information technologies are viewed as the main drive, and network is considered as the main form of institutional organisation (Bates, 2010; Lee & McLoughlin, 2011; Levy, 2009; Murugesan, 2007).

Consequently, three main dimensions of the Internet space are typically distinguished: public, social and market dimensions. The main notions of the market dimension of the Internet space are specified particularly by considering institutional and marketing approaches. This is also why, in this research study, the virtual market shall be referred to as a set of economic relations between sellers and customers under the conditions of the virtual environment. To this end, the notion of the Internet market has also been explored (Bayazit, 2014; Castells & Cardoso, 2006; Grönroos et al., 2000; Reich & Benbasat, 2000).

As a result of the research undertaken in the present doctoral study, the main aspects of institutional theory within the context of the development of the economy of the virtual environment have been defined: institution, transaction and transaction costs (Amit & Zott, 2001; Bayazit, 2014; Loconto & Busch, 2010; Shin, 2008). While an economic institution of the Internet environment is viewed as a set of norms of interaction established between agents in the virtual environment, transaction on the Internet shall be understood as a form of an economic relation established between a firm and trade

parties in the surrounding institutional environment. It is also suggested that these come with the alienation or transfer of either rights and property by means of information and communication technologies. Transaction costs within the Internet environment shall be defined as costs which arise in the process of carrying out online transactions and include expenses for obtaining information and towards the protection of online economic agents' rights (e.g. Allen, 1998; Dahlstrom & Nygaard, 2010; Madhok, 2002).

Within the scope of the marketing approach, particular attention has been paid to specific elements of the marketing mix tool as applied to a product. Additionally, several main approaches to defining the notions of information products have been described (Kotler, 2008; Parvatiyar & Sheth, 2001; Percy, 2011; Xilouris et al., 2014). As a result, information products shall be understood to mean products which are of tangible or electronic nature and the value of which is attributable to the information behind this type of products. To this end, the present research study has also pointed out that information or information products can be viewed as products since the two items share similarities. More specifically and in accordance with the main features of information society shaping the current global market, software, as a pertinent example of Internet-available products, has been considered. From this perspective, information is a product that can be distributed globally.

Within the overall system of institutions of the Internet market, the role of marketing institutions has also been specified in Section 3.1.1 as one of primarily communication between firms and consumers. As a result, the typology of economic institutions of the Internet market has been developed, which further enhances various theoretical approaches to the study of the impact of economic institutions of the real economy upon the sphere of virtual business relations. As part of the literature discussion it has emerged that according to the principle of institutional isomorphism (McQuarrie & Kondra, 2016), economic institutions of the traditional markets are transformed into institutions of the virtual market environment, and entirely new institutional structures characteristic exclusively of the virtual markets are developed (Bayazit, 2014; Castells & Cardoso, 2006; Grönroos et al., 2000; Reich & Benbasat, 2000).

Moreover, the present research study has distinguished various types of institutions of the marketing of e-commerce companies, namely: institutions of online marketing research; institutions of the creation of products for the Internet market; institutions of public relations; and institutions of Internet advertising. The scientific novelty of the development of the typology of institutions of the virtual environment thus lies in the development of a new institutional system which enhances the impact of the known typologies

of economic institutions of the real economy upon the sphere of virtual business relations. Therefore, the knowledge increment also includes the creation of a new typology of economic institutions, which takes into consideration specific institutions of the Internet environment. The scholarly importance of the development of this typology of economic institutions of the virtual environment resides in the enhancement of theoretical concepts of the impact of the institution-based structure upon the Internet environment. Consequently, it is suggested that the practical implications of the development of this typology of economic institutions of the virtual environment involve foregrounding a methodology to be utilised in both forecasting and designing the development of institution-based structures of virtual economic relations (Bates, 2010; Lee & McLoughlin, 2011; Levy, 2009; Murugesan, 2007; Tredinnick, 2006).

Besides, the present research study has presented the typology of transaction costs of e-commerce companies, namely search, negotiation and enforcement costs, in section 3.1.2. The breakdown of the types of transactions costs and the relevance each to given e-commerce products further enhances theoretical approaches to the description of the interaction among e-commerce subjects. The scientific novelty of the development of the typology of transaction costs in the Internet environment is also represented by the creation of a new model of transaction-based interaction of economic agents under the conditions of the virtual market. The knowledge increment includes the creation of a new transaction model which takes into consideration the specificity of virtual economic relations. The scholarly importance of the development of the typology of transaction costs in the Internet environment is further given by an in-depth knowledge of transaction processes under the conditions of the virtual economic environment. The practical implications of the creation of a minimisation of transaction costs on the Internet thus involve an identification of a methodological basis for an analysis of a transaction-based interaction of economic agents within the virtual economic environment (Bates, 2010; Lee & McLoughlin, 2011; Levy, 2009; Murugesan, 2007; Tredinnick, 2006).

In order to develop an apparatus for the assessment of e-commerce product policy, methodological support in the assessment of e-commerce companies' product policies from the point of view of information contents of the product portfolio has been outlined, mainly on the basis of the synergy of institutional and marketing analyses. The methodological support includes classification of e-commerce products, based on their information contents, in addition to distinguishing perfect e-commerce products, e-commerce products which stimulate demand and e-commerce products which do not stimulate demand, the condition of optimality of implementation of e-commerce companies' product policy as well

as the techniques utilised in the assessment of the economic efficiency of agents of the virtual market, in terms of information contents of the product portfolio. The scientific novelty of the proposed methodological support is that this particular approach has been used for the first time and further research studies can enhance and further develop it.

In the course of empirical approbation of techniques employed in the assessment of e-commerce companies' product policies, it has been proven that Internet-based companies which sell mainly perfect e-commerce products or products stimulating demand on the virtual market incur lower transaction costs than online sellers which sell products which do not stimulate demand and are, therefore, essentially products of the traditional market. This proven hypothesis also underlines that the scholarly importance of the developed technique lies in enhancing the apparatus for research on the virtual markets, in general, and on the marketing of e-commerce companies, in particular.

In the course of the conducted empirical research, the interdependence established between sales levels and factors of competition among information products with zero and non-zero price under the conditions of the virtual market has been determined in compliance with the identified structure of factors. Based on distinguishing among various approaches to the implementation of product policy with respect to paid and free Internet products furthermore advance how the product policy in the marketing of e-commerce companies is understood by using specific characteristics of products in order to achieve maximum revenue and maximisation of profit based on assessment of informativity. The dependence between competitive factors, including critics reviews, user reviews, and a competition measure among others, with the level of sales registered by e-commerce companies has also been identified. The scientific novelty of the categorisation of e-commerce companies' product competition resides in up-dating scientific approaches to the research of marketing phenomena occurring in the virtual market and the building of a new model of competition specific to agents who operate within the virtual environment. Thus, the practical implications of building a set of main factors of non-price competition on the Internet additionally contribute to a more effective and thorough understanding of the economic activity of subjects of the virtual environment. For this reason, it is claimed that the practical implications of the developed model imply the development of practical tools of interaction among competing economic agents operating under the conditions of the virtual environment.

In general, based on the results of this doctoral research, it can be concluded that contemporary marketing approaches, coupled with other scientific approaches, enable an in-depth study of the

specificity of e-commerce companies. To this end, the literature review has shown that the number of both previous and recent research studies devoted to analysing the market environment of the Internet has been increasing from year to year. Nevertheless, this research has covered only a small part of what shall be examined in the context of the economy of the Internet environment. It is thus suggested that this aspect can be further explored as the subject of future research in this field of scientific, theoretical and practical knowledge.

6.2 Research implications

It is argued that the research reported in this doctoral thesis makes a significant contribution to both knowledge and practice. The major contribution to knowledge lies in the identification of context specific factors surrounding the assessment of product policy in the marketing of e-commerce companies. Furthermore, the contribution to practice comes from an improved analysis and understanding of how e-commerce companies can maximise profits by improving product portfolio. Overall, the present research study has contributed to both the theory and practice of e-commerce in a number of ways. The following section seeks to discuss the main theoretical and practical implications emerging from this study.

6.2.1 Implications for theory

A sound theory aims to fulfil the parsimony criterion, which involves using fewer concepts and propositions in order to explain the phenomenon as comprehensible as possible (Fawcett, [1999] 2009). From the perspective of theory development, several implications follow from the results obtained via this investigation.

The results of this investigation highlight the importance of the assessment of product policy in the marketing of e-commerce companies. One of the critiques of previous research on the assessment of product policy in the marketing of e-commerce was the overemphasis on specific elements of the marketing mix, such as that of the product, and ignoring valuable data that from analysing e-commerce transactions. In this study, we find that that information such as users' reviews, critics' reviews, branding plays a vital role in shaping e-commerce companies' policies. We're able to put values on the value of each component, derived from our regression coefficients. Consequently, it is proposed that firms' must

properly categorize their products when developing business models to maximize e-commerce adoption by consumers.

In general, the present research study contributes to the scientific literature by establishing rules of pursuing a product policy, and by analysing the development of marketing of e-commerce companies. Thus, this research study has utilised the concept of information society in order to characterise the concurrent society. More specifically, theoretical analysis has been employed in order to portray information society as a socio-economic system in which products of immaterial labour, including information service, knowledge and information, constitute forefront economic activities. Therefore, information technologies have been viewed as the primary drive, whereas networks have been understood as the primary structure of institutional organisations.

Notably, the present research study reviews essential theories, such as institutional theory, with the aim of providing an in-depth insight into the concept of "virtual institutions." The research clarifies the roles of marketing institutions in the overall system of Internet marketing institutions by categorizing them accordingly, particularly through the description of the concept of "institutions of the Internet environment." The classification of institutions into their proper categories allows marketing departments to make better decisions, leading to more efficient and profitable companies. Similarly, the description of these underlying concepts further enhances scholarly and theoretical perspectives on key concepts related to the impact of an institution-based structure upon the Internet environment. Additionally, by developing an economic institution framework for Internet marketing, the research study complements scholarly works on this aspect. The latter thus enhances scientific approaches to the impact of economic institutions upon the sphere of virtual business relations. More importantly, the development of a new framework to categorize institutions, classifying them as either online B2C or B2B commerce or online auctions, leads to an incremental acquisition of a scholarly knowledge base, as it considers a number of specific Internet environment institutions.

The novelty of the research is grounded on the following aspects:

- This research study has also aimed to test and propose a product competition factor model for e-commerce companies by considering differences in the implementation of product policy, as evident in the case of paid-for and free of charge e-products. Thus, it is considered that the product competition factor model is based on the degree of influence on product

policies for the following groups of factors: factors which determine product quality, price, and market share (i.e. product category and a competition measure); factors which shape brand and promotional instruments and instruments supporting competitive advantages (i.e. brand and advertising); and factors which can be seen as a condition of the image, goodwill of e-commerce companies (i.e. critics reviews, user reviews). The regression model identifies the impact each product or marketing factor has upon the sales level registered by e-commerce companies.

- Section 5.3 of this research study proposes an assessment of variables for the effectiveness of e-commerce companies' product policies from the perspective of the information structure of the product portfolio. This entails the classification of products according to information content as well as depending on an assessment of product policy, which comprises four phases, while being based on an optimal implementation by e-commerce companies. Specifically, the four stages focus on: (i) an analysis of product portfolio; (ii) an evaluation of financial performance; (iii) a determination of the number of transaction costs; and, (iv) an assessment of product policy. The study implements a regression analysis to empirically estimate the efficiency of firms. To this end, the proposed methodological support/guidelines facilitate the assessment of the statuses of e-commerce companies' product policies, with the aim of identifying means of improvement.

6.2.2 Implications for practice

The findings of this research have key implications for practitioners involved in the assessment of product policy in the marketing of e-commerce companies. To this end, this research study has demonstrated that the introduction of e-commerce technology does not necessarily guarantee a firm's success; however, two additional factors, namely, information and sound product policies, are essential for businesses' economic success.

Based on the 1st study findings, it is recommended that since user reviews play a significant role in e-commerce firms' sales, they may want to list user reviews in an easily accessible format to increase sales. It is also recommended that e-commerce platforms not yet offering user reviews, do so in the future. E-commerce platforms with user reviews could help consumers cause better-informed decisions. Sounder decisions are expected to lead to increased satisfying consumer experience and will likely result

in replicated customer visits. In turn, satisfied consumers could be influenced to write reviews, through recurred brand exposure. It is further recommended that e-commerce platforms and managers expand the practice of advertising and offering branded products to aid in the decision-making process. This could turn the valence into a fundamental factor in the decision process. All in all, this will support users in partially overcoming the self-selection bias and making better decisions, suited to their preferences.

The main findings and conclusions outlined in the research study can be drawn upon:

- by participant companies operating within the Internet market to direct more resources towards those factors that will improve their marketing strategies employed towards growth;
- by scientific institutions and by individual researchers towards a further development of the theory and the methodology of virtual markets as well as so as to improve the marketing activity of companies operating within the Internet market;
- by higher education when offering and designing business courses on various business- and marketing-related topics, including Marketing, E-Commerce, Internet-Based Technologies in Business and Internet Marketing, among others by looking at specific factors that most contribute to firms' successes, such as those found in this study.

6.3 Limitations and future research

Throughout the evaluation of theoretical, methodological and analytical approaches, several research directions arising from the limitations of this research have been highlighted. However, a number of additional research opportunities are presented here.

Future research can build upon the obtained results, including means for companies to identify and employ appropriate strategies when adopting e-commerce systems. In particular, investigations may be geared at discovering and including additional factors in the model. Moreover, the proposed model is a relational model, so future research could also be aimed at finding a natural experiment to exploit to tease out causal relationships.

The selected sample of companies included in the analysis has limitations, such as the regional focus upon Germany, as opposed to Europe as a whole, or even a selection of European countries. Additionally, this study was only able to focus upon a selected number of e-commerce companies within

Germany and not all on an overall total of all e-commerce companies operating in Germany. This is due to a range of factors, including time- and resource-related constraints of the present research study. It is argued that although the limited selection of companies for analysis in this study limits the data obtained in this instance, it does support the development of future studies within this field, primarily by identifying a number of main issues and suggesting a number of solutions. The present study also only covers certain aspects of firms' marketing and overall business strategy decisions so cannot be thought of as the end all be all of an overall effectiveness and efficiency guide.

Finally, the use of secondary data was leveraged to reach conclusions throughout the study. Future research may add by using primary data. Obtaining current, primary data in its stead would strengthen arguments, conclusions and essential to check the robustness of the results obtained in this research.

In light of these findings, further research may also want to consider the following recommendations outlined in the following items:

- Further research studies need to be looked at by both researchers and e-commerce companies in order to obtain a balanced view of different industries. To this end, it would be beneficial to apply an assessment of product policy in the marketing of e-commerce by more companies aiming to offer a competitive product portfolio or already offering products of various categories. It would then be possible to examine whether a broader spectrum of companies could reproduce the findings outlined in this thesis. Although it believed that the proposed assessment approach is of general benefit, further research studies are needed to verify this line of argument. In this sense, it may be useful to examine if the strategy applied to each particular business type. For example, it is imperative to address the issue of whether the approach to assessment formulation only would be useful to businesses in the specific retail sectors. In the future, this type of information could help provide industry-specific guidelines.
- Research could be carried out to modernise the existing list of success factors and identify any new critical success and failure factors emerging from the experiences of existing and prospective companies trading in either B2B or B2C e-commerce. Considering the increasingly quicker pace of evolution in e-commerce technology and environment, it is argued that this constitutes a continual requirement for future research on the topics of e-commerce, marketing and the Internet environment.

- The whole formulation framework and method of assessment of product policy should be applied to a company in a real setting in order to complete a research study. It is proposed that a company's progress should then be followed by an assessment to test if it receives a return on investment or indeed registers profit. This will be a long-term research project as it may take several years before the profitability of a company becomes apparent (see, for example, Amazon.com). It is likely, therefore, to be beyond the scope of a single doctoral research project, but rather potentially undertaken either as a collaborative or institutional research project.
- A further suggestion for future research would be to extend the study to an investigation of a larger number of retailers. This would enable not only the generalisation of results, but also enrich a more detailed comparison in terms of an assessment of product policy in marketing between small and large companies as well as among companies with varying competitive orientations.
- Future research work can be undertaken in order to investigate the use of e-commerce with a view to exploring issues related to business impact. Examples of issues to further examine would include asking what are the risks in terms of financial outlay and business disruption during a firm's strategy revision, compared with marketing gains, and gains in product policy efficiency? Furthermore, research can be conducted to further examine whether the different cultures of distinct ethnic groups would affect the behaviour of e-commerce customers and how they would impact upon the viability of e-commerce in general.

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Appendix A

Information about distribution of products, based on informativity (based on data from participated in research German e-commerce companies)

	Perfect e-commerce products												Imperfect e-commerce products					Strongly imperfect e-commerce products								
Company #	Goods for cars	Goods for pets	Sporting goods	Goods for children	Household appliances and electronics	Household products	Tools (electric and manual)	Telephone technology and related products	Photo and video equipment	Computer and digital equipment	Network technology and equipement	Cosmetics	Software	Movies	Music	Books	Games	Clothes and footwear	Perfumery	Overall (Sum)	Sum of perfect e-commerce products	Share of perfect e-commerce products	Sum of imperfect e-commerce products	Share of imperfect e-commerce products	Sum of strongly imperfect e-commerce products	Share of strongly imperfect e-commerce products
1	1792120	512044	1197197	697662	526863	3885485	167478	18368	297086	1903801	19920	494466	156781	963294	11450766	27754448	466245	7583942	41337	**59929303**	11512490	19%	40791534	68%	7625279	13%
2	0	0	92	962	1363	19	0	4	0	0	0	0	0	0	0	0	0	22102	0	**24542**	2440	10%	0	0%	22102	90%
3	120	0	1080	200	4240	0	299	5580	0	1360	420	120	380	3300	520	40	815	0	0	**18474**	13419	73%	5055	27%	0	0%
4	57	7	0	1672	53	237	0	6	0	117	0	0	570	45997	52921	1044077	2524	0	0	**1148238**	2149	0%	1146089	100%	0	0%
5	0	0	242	0	1202	1176	0	100	360	1351	0	508	0	250	0	0	0	23571	52	**28812**	4939	17%	250	1%	23623	82%
6	0	0	41	0	70	919	30	0	0	0	0	1175	0	0	0	27	0	3180	25	**5467**	2235	41%	27	0%	3205	59%
7	0	0	0	0	721	424	0	18	5	13	0	0	0	0	0	0	0	3448	0	**4629**	1181	26%	0	0%	3448	74%
8	10612	0	438	32	2488	0	6742	722	5373	33883	10107	0	2965	7567	0	108	1795	2320	0	**85152**	70397	83%	12435	15%	2320	3%
9	0	0	384	0	264	1536	216	192	72	1512	216	0	48	0	0	0	96	0	0	**4536**	4392	97%	144	3%	0	0%

Appendix B

Financial results (in Euro) of online stores used in the study (based on data from participated in research German e-commerce companies)

	2003		2004		2005		2006		2007		2008		2009	
Company #	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**
1	81287367	71783110	111408193	91649844	171912817	135199242	263167108	197018313	333226269	177042288	468164225	323348547	692450214	629628590
2			177376330	191266285	216190339	221086844	244099752	191969989	262776667	196726012	289815085	153978034	239359463	165319199
3			15743630	10672171	20807093	17343477	15870556	14014783	14467632	14235616	11537418	11056797	19350941	18807026
4					182419559	166046192	364978192	331092419	400051894	390992520	366449212	367372866	428957823	371201584
5			419956665	328907931	197238797	116223102	217118775	122858111	221251294	107978748	248280969	105294240	268884498	186876692
6			72896978	61141145	87301822	81418948	113321666	95590055	52959385	43416454	31067007	29135368	36600407	33903636
7					152956648	116594242	149898288	137520842	105066262	92670920	140712572	122573621	170677311	130102169
8									5964369	5436143	12619523	9814882	18170429	13728889
9			2906304	2563255	4250458	4064826	4142224	3999334	4609386	4286467	4702658	4053269	7116804	6553596

	2010		2011		2012		2013		2014		2015		2016	
Company #	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**	**Net Profit**	**Transaction cost**
1	908379378	825939999	2051699152	1904896024	2721028841	2232844184	3312296431	3177305947	3912752221	2850236626	4584317216	3772932098	5471298080	4626107057
2	258466775	235017721	270622142	259593112	273994663	254389803	270594125	249105761	287989837	276252998	290280132	269510015		
3	22265385	21301691	27432121	25013962	29836165	25355798	62191276	52174901	35288272	31292952	29335309	29079047	41571884	38435284
4	434501670	429591467	458818471	415458048	416516176	371309685	62893780	58361786	48732243	48134325	190299268	191409643	171225855	163454971
5	277389372	212762464	251543555	217061522	247039138	243918973	254070789	176581055	247474613	189817325	235738973	203423459	249861322	191647972
6	33849955	35972334	41886372	40698590	194152777	178641764	103303666	85719143	326739934	304226280	357944523	339730575	388851335	375497216
7	182276074	145872612	184851000	160044060	192446265	170148710	232668818	209977106	213380695	170765140	205461546	177888678	185613757	164107842
8	26098353	23472452	27816191	21010162	26694756	23951977	25350632	19393762	25980691	19619338	26955087	25881088	28097295	20668429
9	6177891	5817824	8044324	7032408	8490111	8108751	12421921	10351290	8467470	7255973	9587687	7975463	13700640	12255559