International Journal of Research in Business Studies and Management
Volume 4, Issue 6, 2017, PP 1-13
ISSN 2394-5923 (Print) & ISSN 2394-5931 (Online)

IT Business Value and Business Innovation: An Exploratory Investigation

Athanasios G. Giannopoulos

Department of Management Science and Technology Athens University of Economics and Business (AUEB), IT senior engineer, TREDIT SA

***Corresponding Author:** Athanasios G. Giannopoulos, Department of Management Science and Technology Athens University of Economics and Business (AUEB), IT senior engineer, TREDIT SA*

Received Date: 20-07-2017 ***Accepted Date: 22-08-2017*** ***Published Date: 29-09-2017***

ABSTRACT

This paper presents some initial ideas and findings, from case study analyses, concerning the connection of IT "business value", i.e. "value" created within a firm or company by IT investment, and "innovation creation potential", i.e. its ability to produce innovation through exploitation of internal or external research results and convert them to marketable products or services.

First, some basic notions about IT business value are presented. Then, the paper also presents in summary form the key theories for the definition and measurement of IT business value. Then it goes on to present results from existing research about the factors affecting "innovation production" especially for firms or companies who benefit from publicly funded research in the context of collaborative Transport R&D projects.

The motion that there is a connection between "IT business value" and "innovation capability" is then discussed and evidence for such connection is sought through a number of case studies of specific real-world companies. Three of these case studies (of specific companies who have recently invested in IT), are then presented and investigated as to the results and impacts of their IT investment. The evidence showed that in all three cases, IT created "business value" and increased the ability of the company to adopt innovation for new or improved products.

Keywords: *IT, business value, innovation, business innovation, case study analysis, innovation capability, innovation production, IT impacts.*

INTRODUCTION

The study of "business value" that is a result of investments made in IT[1] has been, and still is, one of the major research topics in the field of Information Systems. Earlier studies have investigated the positive relationship between investments in IT and increased business value realised by the investing organization (Melville et al. 2004; Wade & Hulland 2004; Schryen 2012); (Giannopoulos, 2017). These studies, have managed to provide solid theoretical arguments and empirical evidence that support the argument of added value resulting from IT investments, by providing organizations with both operational and strategic business value[2]. A brief review of such studies and their theories as well as argumentation is given in the next section. The research on IT "business value" is still going on as it is a very complex subject and it involves a great deal of debate and uncertainty.

At the same time, it is now becoming of increasing interest to the research community (and to the present author) to see how a firm or business can create "innovation" to improve its products or services by utilizing better and implementing the results of research or even new ideas and exploit them in the market. "Innovation", which can be defined as a "*market induced implementation of research results*" can be the main creator of "value" within the company. *Innovation impacts* comprise of two dimensions namely *product* and *process innovation* and there is a great deal of research devoted to the factors that "create" or "induce"

[1] Information Technology

[2] There are however, still voices who argue that "the fundamental question of the causal relationship between IT investments and business value remains partly unexplained" (Baker et al. 2008).

such innovation (Belderbos, Carree, & Lokshin, 2004; Zeng, Xie, & Tam, 2010; Gu, Jiang, & Wang, 2016; Shao & Lin, 2016). The current research on the factors that influence "business innovation" is reviewed in a next section of this paper.

The research idea investigated in this paper is the potential connection between IT induced "business value" and the "innovation potential" of the company i.e. its potential to create new products and services for the market. We claim that IT "business value" can be one of the factors that create "innovation" and increase the capability of the business to innovate. Our approach, so far, is based on empirical evidence through a number of case studies three of which we present in this paper. We are also investigating, and partially refer to it here, the impact that publicly-funded R&D projects have, on the innovation performance of companies involved in these projects.

A Review of Research and Theories In Defining IT Business Value

The main research paradigms and their respective theories that have been employed by the various researchers regarding the definition and quantitative calculation of IT "business value" can be summarized in Table 1 below.

Table1. *Summary record of main theories concerning the definition of IT business value*

Paradigm employed	Name of Theory
Microeconomics	2.1.1 Theory of Production 2.1.2 Growth accounting theory 2.1.3 Consumer theory
Industrial Organization	2.2.1 Game theory 2.2.2 Agency theory 2.2.3 Transaction cost theory
Organizational Behaviour	Organizational Behaviour theory
Strategic Management	2.4.1 Collusion/coordination theories 2.4.2 Governance theories 2.4.3 Competence theories 2.4.4 Flexibility theories

A brief summary of each of these is presented here below (for more details see also Giannopoulos, 2017).

The use of the so called *Theory of Production* for the definition of IT "Business Value" is based on the in-depth understanding of the production process that takes place within an organization, as well as on the economic processes that are involved in the conversion of different inputs to outputs. The theory is based in the work of Erik Brynjolfsson (Brynjolfsson 1993) who formulated the theory of production in order to investigate the effects of IT spending on the productivity of an organization, and in addition, to shed light to the reasons behind the emergence of the "IT productivity paradox" (i.e. the negative or non-existent relationship between IT spending and productivity which was documented in the early 70s and 80s). In another study by Erik Brynjolfsson and Lorin Hitt (Brynjolfsson & Hitt 1996) the authors assessed the contribution that IT had on firm-level productivity by using firm-level data collected from annual surveys of IT managers, regarding several different components of IT spending. Furthermore, Dewan, Michael and Min (Dewan et al. 1998) also employed the theory of production for the examination of the relationship between investments in IT and the scale and scope of an organization.

Another theory for the definition of IT "Business Value" is the so called "*Growth accounting theory*". It is mostly employed in order to identify the contributions and impacts that IT investments have in the economic growth of the investing organizations. One of the studies that employed the growth accounting theory is that of Brynjolfsson and Hitt (Brynjolfsson & Hitt 2003). It focused on the analysis of the effects of computerization on the productivity and output growth of organizations. Based on the additional benefits that arise when computerization is combined with complementary organizational investments and change, the authors argued that the long-term benefits of computerization in most cases exceed the short-term contributions, due to the fact that complementary investments to IT (such as organizational investments) require time to "grow" and deliver their true potential. Furthermore, by applying standard growth accounting and productivity measurement

techniques on firm level data sample, the authors examined the relationship between growth in computer spending and growth in output and multifactor productivity for different organisations. Supporting their initial argument, their results revealed that over short periods of time (i.e. 1-year) the estimated contribution of computers is just equal to their initial costs (i.e. they contribute to output growth but not to productivity growth). On the contrary, as the period of time increases, the contributions from computerization also increases substantially above the cost of the initial investment, suggesting that computerization in the long-run does actually contribute to multifactor productivity.

Finally, within the Microeconomic paradigm set of theories, the *consumer theory* has been employed in order to estimate the value from the perspective of the consumer. The definition of "business value" in this case is derived from estimates of IT business value through the total value/benefits that consumers gain from a firm's investment in IT, since they are in a position to purchase a product or service for a price that is less than the highest price that they would be willing to pay. This definition is actually very closely related to the "innovation production potential of the organization since "consumer preference" (for a research result) is the prime factor for determining whether an innovation is produced or not. Brynjolfsson, in (Brynjolfsson 1996), has implemented and empirically tested the *consumer theory*, in order to derive results about the value of IT. His main research argument was that "improvements in IT lead to large annual declines in the effective price of IT" and as a result, "new uses become productive and old uses become even more productive". The connection to "innovation" has been facilitated by another study (Hitt & Brynjolfsson 1996) in which the authors focused on explaining the theoretical relationships among the principal measures of the economic contribution of IT namely, productivity, profitability and consumer surplus. One of the main findings of this study was the assertion that profits, productivity and consumer surplus are not equivalent. The results showed that IT appeared to enable for increased firm productivity and provided a substantial set of benefit to end consumers, thus inducing innovation.

The *industrial organization theory* has offered valuable insights to the "business value" definition by looking at how and why firms jointly interact in IT investment decisions and how the resulting benefits are divided among them. We can distinguish two separate "theories" that have been used here:

- "Game theory" which was introduced in a 2001 study titled "Oligopolistic competition, IT use for product differentiation and the productivity paradox", (Belleflamme 2001) employed game theory in order to give explanations for the over-investment in IT that had been documented over the years and the productivity slowdown. According to the author's research, there are two factors that when combined, provide an alternative explanation for the productivity paradox. The first factor relates to the fact that when IT investment takes place before the associated output is produced, firms may be in a position to use an investment in IT for strategic purposes, rather than simply to minimize costs. The second factor, relates to the fact that a growing slice of IT spending is increasingly devoted to product differentiation rather than making existing production more efficient. The analysis was based on a two-stage game model which resulted in three separate propositions which related to the alternate explanations of the productivity paradox. The results of the author's research indeed confirmed the notion that, if firms utilize IT for purposes other than cost reduction such as product differentiation, it is more likely that a fall in total factor productivity will occur when the latter usage is preferred to the former.
- The other attempt in this group of industrial organization theories was the *agency theory* and the *transaction cost theory* with representative work that of Gurbaxani and Wang (Gurbaxani & Whang 1991). Although the theoretical framework was not further analysed or validated by the authors by using firm or industry level data, their research revealed that the allocation of decision rights depends heavily on organizational and environmental factors such as the culture and the role if IS within a specific firm context. Finally, further research by the authors also indicated that a firm would be more likely to grow horizontally and vertically if IT was used for the reduction of internal coordination costs.

Another theory adopted for the definition of IT Business Value and the impacts that IT has on performance, is the *organizational behaviour*

theory. Devaraj and Kohli, in (Devaraj & Kohli 2000), have applied the organization behaviour theory in the context of the health-care industry in their paper titled "Information technology payoff in the health-care industry: a longitudinal study". The substantive issue investigated in their research was the link between technology and process reengineering with profitability and quality, as well as the combination effect that technology and process reengineering have on organizational performance.

Finally, in the *Strategic Management Paradigm* theory the IT investments are viewed as means of increasing the firm's competitive advantage (Miller 2003; Powell and Dent- Micallef 1997; Zott 2003) or as a necessity to avoid a disadvantageous position (Mata et al. 1995). According to some of these researchers, one of the most prominent ways to examine and measure the business value created by IT investments in the context of the strategic management paradigm, is to examine how IT or the capability that is created by it, specifically relates to one or more profit mechanisms of the firm. The four main core business-level strategic management theories, are the following:

- The *Collusion/coordination-based* one posits that an organization's choice of, positioning and focus within an industry can greatly affect its profitability and together with its abilities to collude, coordinate, and/or cooperate with its rivals act as the main factors that play a significant role when determining the organizations overall productivity (Porter 1980). Also, one of the most prominent roles of IT investments at the industry level is that of adjusting industry/market entry and exit barriers in order to sustain an industry structure that is favourable to positive price-cost margins for all firms in the industry (Drnevich & Croson 2013) while large-scale IT investments can also act as barriers both to entry and exit (Croson et al. 1998), since as entry barriers, they require a large initial capital investment from new industry entrants, which may not be recovered in time and thus become damaging to the new entry and as for exit barriers, they offer very little salvage value since they are highly specialized investments "tied" to the firm's core business, rather than generic investments that can be simply transferred.
- The *Governance-based* one posits that the efficient organization of the different transactions that a firm undertakes is the main factor that greatly affects the profitability and efficiency of the firm, with the main focus being in the minimization of particular costs that relate to the deviation from the ideal governance structure. An ideal governance structure efficiently partitions activities, separating those that should be performed inside the firm from those that should be performed outside the firm. One of the roles of IT in the context of governance-based perspectives and theories is the actual functional use of IT with the goal of increasing the efficiency with which the management of supplier networks and the monitoring and contract performance is carried out.
- Finally, the *Competence-based theory* focuses on the resources and capabilities that the firm can create or draw upon in order to create and capture value. A firm may variously inherit different types or resources and capabilities from its history, by chance or by building them through appropriate managerial action, in order to take advantage of the benefits they bring to the firm. Consequently the focus of the theories involved within this perspective is on the effective utilization of the resources and capabilities at the firm level, that in turn determine the profitability and efficiency of operations of the firm. One of the most important theories identified in this perspective is the theory of the Resource-Based View (RBV) of the firm. The RBV stipulates that the competitive advantage of a firm lies primarily in the application of a bundle of valuable tangible or intangible resources at the firm's disposal (Mwailu & Mercer, 1983 p142, Wernerfelt, 1984, p172; Rumelt, 1984, p557-558; Penrose, 1959). The firm's profitability in the context of RBV lies in the firm's ability to balance between how much value it creates and how much of that value it actually captures. One of the roles that IT takes in the context of competence theories and more specifically the RBV is the support of both the creation and capture of value through its ability to digitally enhance a firm's existing resources and capabilities and/ or enable the creation of new digital capabilities.

The above brief review of the various attempts and theories for the definition and measurement of IT induced "business value" shows that they are all considering a number of parameters that affect the ability of the firm to quickly respond to a change (in this case IT investment) either by improving in terms of its efficiency of doing tasks and minimize the cost of adapting to a new situation, or by measuring a number of productivity indicators and creating a product or service that delivers a given level of consumer value. As such, they can all be related to the "innovation production" potential of the firm or business i.e. its effectiveness in creating a new or improved product or service (from existing research results or simply new ideas). In other words, the IT business value is gained by the firm through its increased ability to reach the consumer with new products or services or – as described in (Teece et al. 1997) - "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments". It is, thus, the basic premise of this paper that creating "IT business value" is directly related to an enhanced "innovation production capability" and this premise will be investigated and researched further.

Factors Affecting the Innovation Potential of A Firm

The investigation of the "innovation creation potential" of a firm or business has to start from the full definition of the notion of "innovation creation potential". "Innovation" as such, has been defined as the "market induced exploitation of research results by the creation of new products or services or the improvement of existing ones". Research is usually funded by public or private funds which are committed in the context of specific research products in the context of collaborative Transport R&D projects. The exploitation of the results of these research projects in order to create "innovation" is a "must" especially for the publicly funded research projects. Particularly for R&D projects that explore a novel technological field, the requirement to develop potentially useful research results that can be commercially transformed and exploited to develop concrete innovations, is a fascinating field of study especially for the commercial transformation and exploitation of research results stemming from publicly-funded collaborative research – for obvious reasons (Kimberly, 1981; Damanpour, 1991; Harder, 2014; Wiesenthal, Condeco-Melhorado, & Leduc, 2015).

In further defining the "innovation creation potential" we note that this relates to a number of parameters within a firm or business which can be thought off as the "independent variables" that interact and define the "dependent variable" which is either the "Product Innovation" i.e. a new or significantly improved good / services, as a result of a specific research project, or "Process Innovation" i.e. a new or significantly improved processes, as a result of a specific research project.

It is of interest to see the "independent variables" which have been identified up to now from existing research and studies. These have been taken from a number of existing research studies (primarily from *Spanos, Y. E., & Vonortas, N. S. 2011) and* can be distinguished in four broad categories and are presented briefly in the following (shown also in diagrammatic form in Figure 1):

Firm Related Factors

These relate to the specific firm or business that is doing the original research or the firm or business that is undertaking its exploitation. They characterize the internal environment that motivates the generation and flow of ideas and most importantly their transformation into innovative products and services (Kimberly, 1981; Damanpour, 1991; Ahuja & Katila, 2004; Spanos & Vonortas, 2011; Gu, Jiang, & Wang, 2016). Resources, capabilities and experience in innovation activities act as critical determining conditions for a firm's capacity to develop innovations and exploit R&D results. According to the references mentioned above, the "firm-related" independent variables can be distinguished in two broad categories as follows:

Absorptive Capacity, i.e. the capacity to absorb and adopt the innovation. This is further defined by:

- The firm's innovation history, e.g.
  - Intramural R&D (i.e. the one performed x years within the project)
  - Extramural R&D (i.e. the one performed x years prior to the project)
- Its prior innovation performance, i.e. whether the:
  - Product innovation is new to the market
  - Product innovation is new to the firm

- The integrative capabilities, i.e. the capabilities of integration and coordination of all stakeholders involved as well as of all the related factors for the production of innovation.

The *Appropriation Capabilities* of the firm, further defined by:

- Its formal appropriation capabilities, e.g. for obtaining raw materials or other products, and
- Its informal appropriation capabilities.

Project-Related Factors

The initial research characteristics of any given research project, e.g. the thematic area into which it belongs or the size of the consortium that has undertaken the research work or the management aspects of the project are also important factors affecting the "innovation potential" (Harder, 2014; Wiesenthal, Condeco-Melhorado, & Leduc, 2015). The project-related factors have been distinguished in:

Project uncertainty, further defined by:

- *Project novelty*, i.e. how "novel" is the research performed in relation to the firm's usual activities. This can be further broken down as:
  - Scientific and commercial risk that the project entails;
  - Distance from firm's core technological expertise.
- *Project complexity*, i.e. the degree of difficulty and complexity of the research project. This can be distinguished into:
  - Perceived scientific complexity of the project; and
  - Perceived technical complexity of the project.

Whether the project builds on past R&D or not.

Market-Related Factors

These refer to the pressures from the market environment under which the firm or business operates (Damanpour, 1991). They induce firms to innovate and include factors such as: competitive intensity, market uncertainty, technological dynamism, and the stage of the industry's life-cycle are expected to have a bearing on the firms' propensity to innovate, or to adopt innovative technologies developed elsewhere (Park, Chen, & Gallagher, 2002; Aghion, Griffith R, Blundell, Griffith, & Howitt, 2005). More specifically the market related factors can be distinguished according to the *stage of the market life-cycle*, i.e. whether it is a:

- Emerging market;
- Market in its early stages of development;
- Fast growth market; or
- Mature – stable Market.

Technology or Context - Related Factors

These factors are related to the specific "technology" that is being converted to marketable product through the innovation production process. In case that the research results is not a "technology" or "technologically oriented" we can refer more generally to the "research context". They include:

Factors relating to the *"potential for exploitation"* of the research product (e.g. an IT solution or system). These include e.g. :

- Maturity of the technology;
- Reliability and accuracy of the technology;
- Existence (or lack) of standardization;
- Cost of adoption;
- Privacy issues;
- Need for customization.

Factors relating to the "*implementation environment*", i.e. the:

- Labour requirements for the implementation;
- Data availability and quality;
- Existence of a stakeholder cooperation framework, etc.

In the literature one can find a number of other potential influencing factors such as for example the so called "*Network related factors*" that are largely based on the *Institutional theory* that examines the structural and behavioral changes in organizations (Huigang, Nilesh, Qing, & Yajiong, 2003; H, K, & I, 2003).

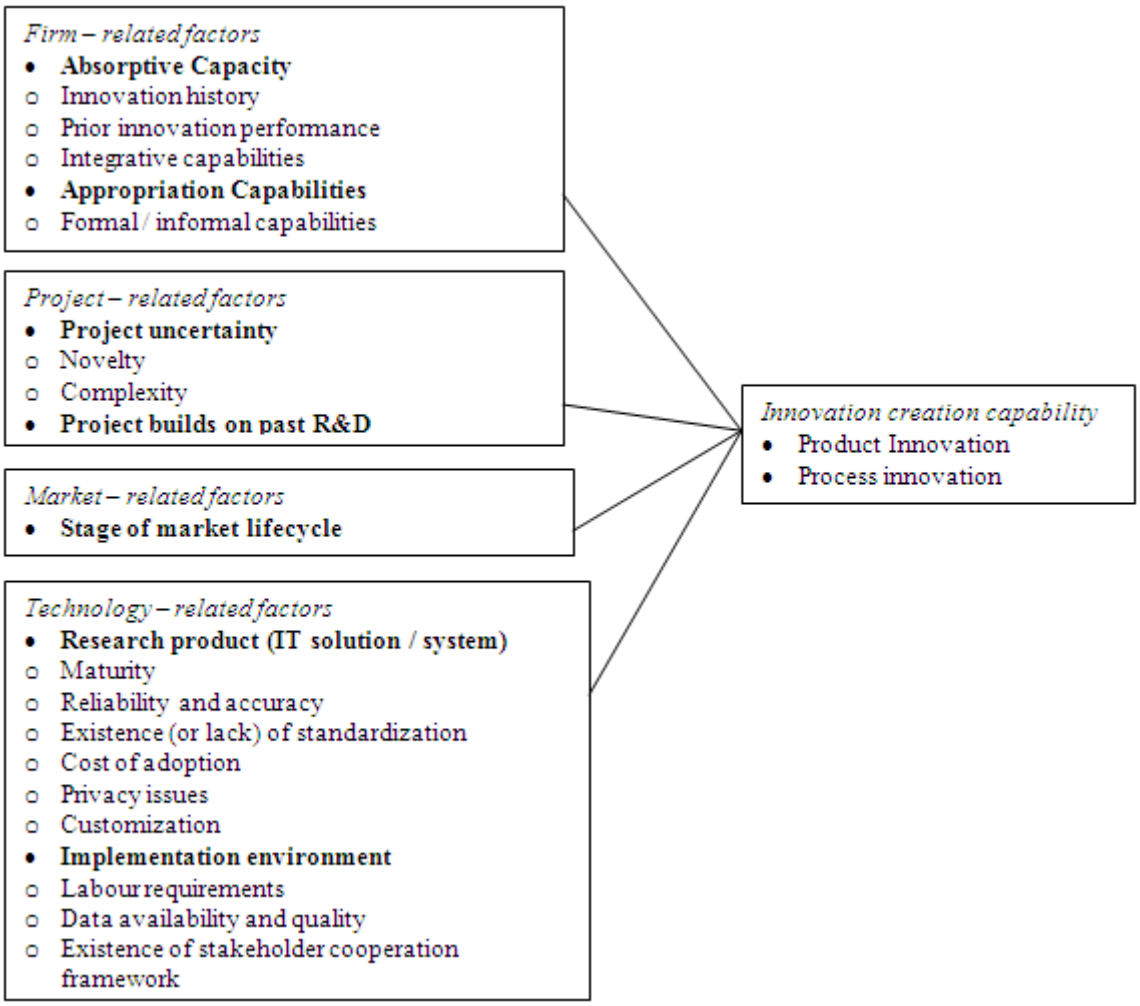

Fig1. *Diagrammatic representation of innovation production influencing factors*

Source: *Drawn by the author on information from a review of existing literature, primarily in: Spanos, Y. E., & Vonortas, N. S., 201*

THE METHODOLOGICAL APPROACH FOR OUR ANALYSIS

A comparative evaluation of the previously mentioned IT "business value" definitions and quantification approaches that was performed by the author (see Giannopoulos 2017) has produced a preference for the theory of the Resource-based view (RBV) of the firm as a method of defining and measuring IT "business value". The Resource-based view of the firm is part of the Competence-based perspectives of the Strategic Management paradigm and it renders itself as an effective theoretical framework for explaining the process with which IT relates to both the strategy and the performance of the organization. It can also facilitate the estimation of the strategic value that IT resources offer to an organization and by consequence its "innovation production" potential.

As a first step, and in order to collect further evidence of the importance and interaction between "IT business value" and "innovation production potential" we performed an exploratory analysis of several case studies of real world organizations. This approach was used in order to scope out the magnitude and extent of the IT business value phenomenon in the case of real world organizations and at the same time relate this with their innovation potential. The organizations chosen were known "innovators" who already had invested in Information Technology.

Furthermore, this approach was chosen in order to verify and cross-reference with the real world examples, the initial ideas and assumptions regarding the concept of IT business value and the different "elements" that comprise it. The case studies were analysed using a multiple level of analysis, examining each case study at the individual, business unit and organizational level, in order to be in a position to acquire a

holistic view of how the IT business value is realized within the organization by the different departments and the different key users of the organization and how this is also related to innovation production within the firm. The organizations that were chosen have been drawn from a sample of Greek organizations that have taken part in a country-wide 2016 competition that rewards companies for the excellent utilization of IT in their business.

We present here three such case studies. In the first section of each case study presentation the overall nature and business focus of the organization is presented, while in the following sections, the relationship of the organization with IT and innovation is described in further detail. In the last sections of each case study we give the results of the analysis of the mechanisms with which IT creates "value" and "innovation" for the organization.

Furthermore, as part of an ongoing PhD research, we are investigating the "innovation production potential and behaviour of firms that participate in publicly funded research through an extended questionnaire survey conducted among nearly 700 firms worldwide. By analysing the answers to the questionnaire we expect to be able to establish specific relations between the "innovation production" characteristics of the firm and the most influencing factors (independent variables) among which the IT related business value.

INDICATIVE RESULTS OF THE CASE STUDIES

Case Study A

Company A is one of the largest and oldest automotive marketing companies in Greece. The company has a very recognizable brand and its products are highly associated by its consumers with increased reliability, safety and technological excellence. By maintaining close communication and cooperation links with its customers and partners, the offering highly dynamic trade policies and innovative financing programs as well as its continuous effort to innovate, Company A has become one of the most competitive companies in the industry, that has managed to not only overcome and survive the difficult economic conditions that are present in Greece at the moment, but also to grow and invest in the extensive integration and utilization of IT for the re-design and automation of a variety of its core business processes.

One of the most notable examples of the above utilization of IT is its initiative to create an integrated system for managing the different independent car dealers with which it cooperates across the country. The new system can be defined as an innovation as it was implemented and it enabled Company A to have centralized information and functionality regarding the provision of qualitative and fully integrated sales services, vehicle repair services, warranties, financial management as well as warehouse and inventory management. It is also offering it potential for marketing it to a wider market if the firm decides to overcome the understandable commercial competition risks. The system enabled the company to provide to different groups of stakeholders (independent dealers, salespersons etc.) with real-time access to data and information country-wide, through the replacement of old/obsolete practices with automated/optimized new practices.

The business value that the company has gained from the above mentioned IT system investment consists of a number of value producing elements which in turn have increased the capability of the company to produce innovation and make it more "innovation" oriented. They include:

- The online, real-time access to information improved drastically the ability of the company to collect, manage and use data and information for measuring its performance. The results of this development can be quantified mainly by calculating increased sales and reduction of operating costs.
- There were concrete organizational and strategic planning improvements for the management of the company which were detailed by the management. Their existence enables better planning and risk taking for the company a fact that increases its innovation production potential. The definition of a performance measurement indicator in this respect would enhance quantification of this element.
- The new integrated system allowed for the full automation of a variety of processes that were involved in the car sale cycle (initial offer, sale, and follow up actions) as well as the management of the different licensed

repair garages that were operated by the company.

- There was also full automation of the processes that relate to car warranties and the management of the stock (warehouses), updating of different quantities, prices etc. The time saved for these processes was another value creating element.
- Finally, the fact that data and statistics were immediately visible to all levels of the company's operation (i.e. the central management level but also the level of each individual stakeholder with which the company was in business relation) created the background for further improvements and also new innovatory products and services that could be developed for the future.

Overall, according to the company's management, the use of Information Technology and the investment made in the specific innovatory system, which is now part of the company's culture and main strategy for the future, has offered specific and quantifiable "business value" for the company and has increased its capacity for innovation production. Since its development and implementation, company A has enjoyed a significant competitive edge over their competition.

Case Study B

Company B is a private credit institution with international presence, consisting of a number of branches in South-eastern Europe and the Eastern Mediterranean, currently headquartered in Greece. It offers a full range of financial products and services and possesses, as well as particular know-how in the areas of medium-sized and small enterprises, agricultural banking, consumer and mortgage credit and green banking. It is also involved in capital markets and investment banking, as well as leasing and factoring.

These services are offered through the nation-wide network of branches and ATMs and also through a new innovation based *electronic banking network* (EBN). To produce its new EBN the company invested in IT, and by doing so it encouraged a number of innovations which it was the first to implement realising further benefits and increases in business value. The whole process of investment in IT and creating innovatory systems and services started in 2010 or thereabouts and it continues to date with developments that are creating business value through significant increases in the company's overall efficiency and operating cost reductions.

We will refer to one such characteristic improvement that shows the interplay between the creation of specific quantifiable IT business value and at the same time the increased capability for further innovation that the company gained from it.

During 2011 the company was troubled by the fragmentation of their printing equipment as well as the high average age of this equipment and the lack of information on its overall operating costs (maintenance and management). After detailed in-depth research into the situation, the company identified that the average age of their printing equipment was well over three years and included over 90 different printing machines, resulting in users of the printing services being very unsatisfied by the quality of the provided printing service. In order to adopt a more effective and efficient approach in the management of their printing, the company decided to invest in a new innovatory IT based printing management solution that was to be provided by a third party supplier. The main factors that drove the Company's decision was the scalability of the offered solution as well as the quality of design of the system, which was to cover all user's needs with a systematic and holistic approach. The investment in this IT related innovation and its implementation was to be carried out in a modular fashion throughout the Company so that the users did not experience any down-time. The service provided by the third party also included the training of the personnel.

After the introduction and full implementation of the new system of printing, the company immediately saw positive results. Just after one year of operation of the new print service, company A noted a 20% drop in the volume of printouts (via the use of the network printing and scanning capabilities that became available), a 35% drop in the consumption of printing paper and a 40% drop of the overall costs that related to printing. Furthermore, other than the above mentioned cost reductions and operational and environmental benefits, the Company gained administrative and management related benefits, that enabled for central management and reporting functionalities for its printing services, which resulted in the reduction of time spent for the management of consumables by 0,5 FTE (Full

time equivalent) and technicians occupation time by 1 FTE.

The new printing services that the company implemented, offered significant business value since they optimized and enhanced the efficiency of printing but also the overall effectiveness of the printing services of the company. Moreover, the fact that the Company followed a comprehensive plan for the organization and implementation of this initiative, meant that the resources of the company were utilized more efficiently and by doing so it created the circumstances for new innovatory services to its customers that included:

- Faster information and record keeping;
- On-line updating of records and customer notification;
- Quicker turnover of customers at the desk.

Case Study C

Company C is one of the largest natural cosmetics company in Greece, established during the 1970s. Through the development of over 4000 different formulas that are based on natural raw materials the company has gained extensive know-how in the development of high-quality cosmetic products. These can be found in many pharmacies and specialised cosmetics shops around Greece as well as internationally, due to the company's strong presence in different countries worldwide.

In 2012, the IT department of the company redesigned and upgraded completely the IT environment under which the company operated by investing in new off-the-shelf items as well as in the creation of totally new and innovatory systems based on existing research that was conducted in a cooperating University. The end objective of this IT investment was to enable the provision of valuable new and innovatory services to different stakeholders of the company (sales representatives etc.), as well as in order to contribute to the achievement of other operating and business goals.

The basic objectives for the new systems and services that were to be implemented by the new IT and innovation investment, were:

- Increased ability to ensure the high availability / performance, uniformity and standardization as well as security and rapid data recovery, of both equipment and applications.
- Improvement of the communication between executives in order to ensure cooperation between groups and departments, even when communicating from different remote locations.
- Improvement of the overall services offered to the customers and the support that the company provides to the wholesale end-users.
- Reduction of the company's operating expenditures (e.g. telecommunication costs, travel costs, training costs, energy consumption costs etc.).

The overall context within which all the above changes and innovations were to apply was a more agile, modern and environmentally responsible practice. In the process of this IT based "business value" enhancement several innovations were developed and implemented:

- Virtualization of the infrastructure of the company's systems, which allowed for the continuous and uninterrupted provision of services to its internal stakeholders.
- Optimization of the availability, performance and management of any business innovatory solutions offered by the system through the remote management functionalities it offered.
- "Unified communication" practices throughout the different activities of the company. The main goal in this context was the automation and unification of user and device communication in a common context, which resulted in the optimization and enhancement of communications throughout the company by eliminating factors such as latency and device interdependencies.
- Introduction of the so called "model retail shop" service in order to support the ongoing strategic goal of the company for continuous expansion of its operations to different areas both inside and outside of the Greece.
- Furthermore, in order to ensure the faster and within specific budget objectives for the deployment of new retail shops, the IT department focused on the standardization of the development and interconnection of the new retail shops with the main IT systems of the company while satisfying the requirements

for functionality and equipment use at the level of its retail shops.

The end results of this IT related innovation that was produced both within and outside the company were measured in terms of both quantifiable and non-quantifiable business value that was developed through:

- New retail shops which the company has opened with predetermined development and operating costs, a fact that enabled the company to be more competitive and also to enter new markets faster and more dynamically than before.
- Optimization and enhancement of different internal and external functions of the company.
- More effective decision making capabilities due to improved capabilities of the company for effective communication between the different executives.

CONCLUDING REMARKS

The value of Information Technology in creating "business value" for investing organizations has been documented and researched by extensive studies as shown in section 2 of this paper. This is mainly done through assisting the investing organisations to cut costs and become more efficient and enabling them to identify and utilize new, more effective and efficient ways for conducting their core business. The Resource Based View (RBV) approach has been adopted in the past by this author as an efficient tool for studying this interaction. Its use has shown that a company can (through IT investment) achieve a better organisational function and creation of new (IT and non-IT) resources that directly affect the already existing resources and operating capabilities of the company. The IT business value to be created is a very important factor that must be taken into account for any IT investment and implementation initiative. If effectively leveraged it occurs in all business functions of the company i.e. inside and outside the IT department. However, managers must also give particular attention to aspects such as IT training and human development outside the IT department.

Another implication that could be drawn from the analysis of the cases studies is that there are important strategic impacts that can be connected to IT investment and IT business value. These are likely to be observed through the increased ability of the firm to innovate and thus increase its ability to offer new products in the market, execute some of its operational processes more effectively and also increase its ability to effectively re-configure existing functional processes and competencies.

Our thesis is therefore that besides the creation of "business value", IT investment also increases the capability and disposition of the company to create "innovation" and become an innovation creator both through internal processes and through third party innovation subcontracting.

The three case studies presented here, as well as the others that were also performed by the author, confirmed this view. They provided initial evidence that the "business value" potential of IT investments can be considerable, as well as measurable but at the same time the innovation production capability i.e. the possibility to create new and improved products and services, can also be enhanced. This can be a further benefit and inducement factor for the decision makers to invest. The increased innovation production capacity, can increase the operating efficiency of the company itself but also its capability for new products and services for the market. These will further increase the business value of the company and can be of interest to the majority of business executives who want to evaluate their IT investments decisions.

The thesis that IT business value is connected with the innovation capacity of the firm, that is initially supported by the case studies evidence shown here, will be further studied and researched by the author in the future. This will be done with a thorough analytical approach involving a systematic collection of data through a questionnaire survey and analysing the responses.

REFERENCES

[1] Aghion, P., Griffith R, Blundell, R. W., Griffith, R., & Howitt, P. (2005). Competition and innovation: an inverted U relatioship. Quarterly Journal of Economics, 5, 701-728.

[2] Ahuja, G., & Katila, R. (2004). Where do resources come from? The role of idiosyncratic situations. Strategic Management Journal, 25(8/9).

[3] Baker, J., Song, J. & Jones, D., 2008. Refining the IT business value model: evidence from a

longitudinal investigation of healthcare firms. ICIS 2008 Proceedings.

[4] Barney, J., 1991. Firms Resources and Sustained Competitive Advantage. Journal of Management, 17(1), pp.99–120.

[5] Belderbos, R., Carree, M., & Lokshin, B. (2004). Cooperative R&D and firm performance. Research Policy, 33(10), 1477-1492.

[6] Belleflamme, P., 2001. Oligopolistic competition, IT use for product differentiation and the productivity paradox. International Journal of Industrial Organization, 19(1-2), pp.227–248.

[7] Brynjolfsson, E., 1996. The Contribution of Information Technology to Consumer Welfare. Information Systems Research, 7(3), pp.281–300.

[8] Brynjolfsson, E., 1993. The productivity paradox of information technology. Communications of the ACM, 36(12), pp.67–77.

[9] Brynjolfsson, E. & Hitt, L., 2003. Computing productivity: Firm-level evidence. Review of economics and statistics, 84(4), pp.793–808.

[10] Brynjolfsson, E. & Hitt, L., 1996. Paradox lost? Firm-level evidence on the returns to information systems spending. Management science, 42(4), pp.541–558.

[11] Cardinal, J. S., & Marle, F. (2006). Project:the just necessary structure to reach your goals. International Journal of Project Managment, 24.

[12] Croson, D.C., Fox, J.F. & Ashurkov, V.L., 1998. Flexible entry strategies for emerging telecom markets. Technological Forecasting and Social Change, 57(1-2), pp.35–52.

[13] Damanpour, F. (1991). Organizational innovation: a meta-analysis of effects of terminants and moderators. Academy of Management Journal, 34.

[14] Devaraj, S. & Kohli, R., 2000. Information technology payoff in the health-care industry: a longitudinal study. Journal of Management Information Systems, 16(4), pp.41–67.

[15] Dewan, S., Michael, S. & Min, C., 1998. Firm characteristics and investments in information technology: Scale and scope effects. Information systems research, 9(3), pp.219–232.

[16] Drnevich, P. & Croson, D., 2013. Information Technology and Firm-Level Strategy: Toward an Integrated Theoretical Perspective. MIS Quarterly, 37(2), pp.483–509.

[17] Giannopoulos Ath. (2015). Critical Success Factors in ERP Systems Implementation: the case of medium and small sized Enterprises,. Journal of Business Management and Applied Economics, Scientific Papers (www.scientificpapers.org), Vol. IV, Issue 2, March 2015.

[18] Giannopoulos Ath, (2017), "Defining IT Business value under conditions of economic austerity" accepted for publication in the Journal of Advances in Management Sciences & Information Systems.

[19] Gu, Q., Jiang, W., & Wang, G. G. (2016). Effects of external and internal sources on innovation performance in Chinese high-tech SME: a resource-based perspective. Technology Management(40), 76-86.

[20] Gurbaxani, V. & Whang, S., 1991. The impact of information systems on organizations and markets. Communications of the ACM, 34(1), pp.59–73.

[21] Harder, B. T. (2014). Accelerating Implementation of Transportation Research Results. Washington DC: National Academies of Science.

[22] Hitt, L. & Brynjolfsson, E., 1996. Productivity, business profitability, and consumer surplus: three different measures of information technology value. MIS quarterly, 20(2), pp.121–142.

[23] Huigang, L., Nilesh, S., Qing, H., & Yajiong, X. (2003). Assimilation of enterprise systems: The effect of institutional pressures and the mediating role of top management. MIS Quarterly, 31(1), 59-87.

[24] Kimberly, J. R. (1981). Organizational Innovation: the influence of individual, organizational and contextual factors on hospital adoption of technological and administrative innovations. Academy of Managament Journal, 24.

[25] Melville, N., Kraemer, K. & Gurbaxani, V., 2004. Review: Information technology and organizational performance: An integrative model of IT business value. MIS quarterly, 28(2), pp.283–322.

[26] Park, S. H., Chen, R., & Gallagher, S. (2002). Firm Resources as Moderators of the Relationship between Market Growth and Strategic Alliances in Semiconductor Start Ups. Academy of Management Journal, 45(3).

[27] Pelled, L. H., Eisenhardt, K. M., & Xin, K. R. (1999). Exploring the Black Box: An Analysis of Work Group Diversity, Conflict, and Performance. Administrative Science Quarterly, 44(1).

[28] Porter, M., 2008. The five competitive forces that shape strategy. Harvard business review, pp.1–18.

[29] Porter, M.E., 1980. Competitive strategy: techniques for analyzing industries and competitors, New York: Free Press.

[30] Schryen, G., 2012. Revisiting IS business value research: what we already know, what we still need to know, and how we can get there. European Journal of Information Systems, 22(2), pp.139–169.

[31] Shao, B. B., & Lin, W. T. (20016). Assessing output performance of information technology service industries: productivity, innovation and catch-up. Production Economics, 172, 43-53.

[32] Spanos, Y. E., & Vonortas, N. S. (2011). Innovation impacts of Publicly-funded collaborative R&D. DIME final conference, 6.

[33] Wade, M. & Hulland, J., 2004. Review: The resource-based view and information systems

research: Review, extension, and suggestions for future research. MIS quarterly, 28(1), pp.107–142.

[34] ziesenthal, T., Condeco-Melhorado, A., & Leduc, G. (2015). Innovation in the European transport sector: A review. Transport Policy, 86-93.

[35] Wong, S. S. (2004). Distal and Local Group Learning: Performance Trade-offs and Tensions. Organization Science, 15(6).

[36] Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. The Academy of Management review, 27(2).

[37] Zeng, S. X., Xie, X. M., & Tam, C. M. (2010). Relationship between cooperation networks and innovation performance of SMEs. Technovation, 30, 181-194.

Citation: *Athanasios G. Giannopoulos "IT Business Value and Business Innovation: An exploratory investigation" International Journal of Research in Business Studies and Management, vol 4, no. 6, 2017, pp. 1-13.*