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INVESTIGATINGTHE EXISTENCE OF BUSINESS-IT ALIGNMENT TRAP IN FINNISH ORGANIZATIONS

(Evidence of a Survey Study)

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1 INTRODUCTION

The emergence of information technology (IT) in recent times has brought tremendous development to the way enterprise businesses are conducted. This has led to rapid increase in the reliance of most of the vital parts of business on IT for sustainability and business success. The survival of most economic driven organizations is predominantly determined by IT. Inspite of this, there is need for managements to ensure that IT strategies are arranged in ways that will conform to organizations' strategies so that the expected value of IT investments on business can be delivered within expected frame time. The different types of issues on benefits and the value delivery on investments revealed that there is either gap or misalignment between the strategies of IT and that of business strategies leading to IT alignment traps. This suggests that there is need to investigate the critical inherent factors that are inhibiting the complete benefits of IT on business.

Previous researches revealed that organizations seeking to deliver higher business performance through IT must ensure they master the concept of business-IT alignment, which is the extent to which IT departments align their strategies with the business priorities and values. IT alignment is defined as "the harmony that exist between enterprise IT investment and its strategic objectives to build capabilities needed to deliver business value" (Board briefing on IT Governance 2nd Edition, p. 22). This is interchangeably used as strategic alignment, which is defined as "the extent of fit between information technology and business strategy" (Paul & Alain 2011). There have been instances where organizations spend so much on IT, but the investments do not culminate into business growth or any advancement in competitive advantage over the competitors. This could either be a function of better IT capabilities or infrastructures above them by their competitors. This event usually makes organizations to spend more, which may eventually drag the project to a halt or render its effectiveness very low.

According to Shpilberg, et al. (2007), they said there have been many misconceptions about the nature of the IT. They identified that most often, the inability of IT to deliver as expected is not likely to be the subject of misalignment, but a composite of other complexities such as systems, applications and other infrastructures. These could as well include lack of IT savvy or lack of IT practices as required by the business units. According to the statement of Richard F. Connell, who indirectly defined alignment trap as "the alignment that exist between poorly performing IT organization and the right business objectives, which cannot deliver the expected business value" (cf. Shpilberg 2007). On the other hand the alignment between a very good performing IT organization and wrong business objectives or strategies, may not equally deliver the expected results. Hence,

good IT alignment or strategy alone may not be able to bring the expected business benefits. Other prior research also established the efficiency of IT and its deployment impact on the business benefits of IT. This is the motivation for enterprise architecture. Thus there are two generally agreed propositions.

- Good alignment of business and IT increases the business benefits of IT
- Sound enterprise architecture increases the business benefits of IT

EetuNiemi (2006) in his research work referred to enterprise architecture (EA) as the composites of all models required in the management and development of an organization, built on the premise of business processes, information systems and technological infrastructure. EA is stated to be the power engine that drives the alignment and integration of strategy, people, business and technology, and supply enterprise agility in an ever-changing environment. Toomas, et al, (2011), maintained the claim of Zachman on EA as the representation of a high-level view of an enterprise‘s business processes and IT systems, their interrelationships, and the extent to which they interact with different parts of the enterprise. Enterprise architecture could then be viewed as a model that connects business operations with IT systems and processes and as well reflect their interactions with other organizational components to engender business value.

What happens when these two propositions are investigated at the same time? This was done by Shpilberg, et al, (2007). They discovered that those organizations that do not realize business value delivery in spite of good business-IT alignment suffer from low IT efficacy, that is, poor enterprise architecture. This is probably due to several complex factors. In respect to the aforementioned phenomenon, this research aims to investigate whether business-IT alignment trap exists, and to investigate what other factors are related to business-IT alignment and enterprise architecture quality.

1.1 Research Objective

The purpose of this research is to investigate the validity of business-IT alignment trap in Finnish organizations, with considerations for some important variables and their causative factors. These variables will be investigated from the previous study of Shpilberg, et al, (2007) and also through the review of the related articles that explained the benefits that IT alignments and enterprise architecture offer and also find out if there are other useful variables that could be used to support this claim. The goal of this work seeks to provide good theoretical and analytical insights to the complex connection between IT, business to see whether or not the relationship is strong enough to deliver the expected

strategic value of IT. The degree of their impacts on organizations performance will determine the true existence of business-IT alignment trap or not.

1.2 Research Questions

The main research question of this research is whether or not a business-IT alignment trap exists in Finland using the Finnish IT barometer data for the evaluation. In order to be able to provide a concrete answer to this research question, this research needs to answer to the following sub-questions.

- What is a business IT alignment trap?
  - The dimensions of business-IT alignment trap are business-IT alignment and efficacy of IT as a whole.
- How to analyze business-IT alignment trap using the Finnish IT barometer data?
  - What survey items (variables) does the Finnish IT barometer have for business-IT alignment, for the efficacy of IT and for the business benefits of IT?
  - Which other survey items are related to business-IT alignment and its efficacy of IT?
  - It may become necessary to divide the data into high IT-intensive and low IT-intensive groups and analyze them separately
- Is the business-IT alignment trap true according to the IT barometer data used?
  - The Finnish IT barometer data will be used to perform statistical analysis.

The answers to these questions will reveal whether a business-IT alignment trap exists or not in Finland.

2 THEORETICAL BACKGROUND

This chapter reviewed previous study that was conducted by Shpilberg, et al. on the subject of IT-alignment trap, to understand various concepts that were used in conducting the research. It also investigated other concepts that could possibly be useful in the research process by studying the benefits of alignments of IT and enterprise architecture. Other factors such as strategies and IT management portfolio were also investigated to understand the complexities that surround the alignment of IT with business in delivering the expected benefits.

2.1 Alignment Trap

Business-IT alignment has been one of the major driving forces of business performance. It has contributed immensely to the enhancement of business operations, and has well created competitive advantages. As a result of this remarkable impact of IT on business performances, many organizations have embraced business-IT alignment as a dynamic tool to drive their business operations. This was the case of the young discount-brokerage house, Charles Schwab & Co, a large financial company that emerged very rapidly using Information Technology capabilities (Shpilberg et al.2007). They were able to use IT to drive their business to high level of performance, until they later encountered a huge problem leading to sharp decline in business growth. The decline was assumed to be caused by IT that formerly gave them great leverage above their competitors. The situation which got so tensed for them to the extent that they were unable to deliver business value on investments. This resulted in the loss of their former competitive advantages (Shpilberg et al. 2007). In the research carried out by Shpilberg et al. (2007), they realized that even some of the companies with high level of alignment often experience fall in business performances. In respect to this, they argued that business-IT alignment is not sufficient enough to generate the expected business values. “Underperforming capabilities are often rooted not just in misalignment but in the complexity of systems, applications and other infrastructure” (Shpilberg, et al. 2007).

Peppard et al, (2007), supported the fact that many organizations are not realizing the full benefits of IT because most of their investments of IT on business are not delivering the expected business values. They further pointed out the fact that there have been many misconceptions about the definition of IT success. Generally, success is based on the premise of whether the expected business values are delivered on time, within budget, and meet the technical specifications (Peppard, et al. 2007). Their expectations have little

or no focus on the effectiveness of the business in exploring and maximizing the IT functions in order to deliver the expected business benefits. Weill & Aral (2006) claimed that IT investments alone are not sufficient to fulfill all the major business objectives, irrespective of the level of sophistication of the IT systems. They also affirmed that for IT investments to generate business values there must be an effective IT-portfolio that encapsulates IT practices and capabilities, otherwise referred to as IT savvy. This is reflected in the success story of the 7-Eleven Japan Company that was used as a case study, the company experienced consistent success in their IT investments, delivering values promptly as a result of their consistent management of IT portfolio that conformed to their business strategies (Weill & Aral 2006).

These claims supported the point that was established by Shpilberg, et al. (2007) that "Underperforming capabilities are often rooted not just in misalignment but in the complexity of systems, applications and other infrastructure" It is very clear that there are other contributing factors that enhance the delivery of the expected business values on IT investments. These are mostly responsible for the alignment trap of IT. The alignment trap can be defined as the inability of a business to realize the expected business benefits on IT investments regardless of the business-IT alignment that organization has. Peppard et al. (2007) listed some of these values as increasing customer retention rates, growing revenue generation, improving cross-sell opportunities, converting leads into sales, reducing the cost of marketing campaigns, and increasing the average number of products per customer among many others.

2.2 Business-IT Alignment and Investment Benefits

The business-IT alignment is generally defined as the degree of alignment that exists between IT functions and business strategies (Reich & Benbasat 1996). It is often referred to, as the extent to which IT activities conform to business needs, objectives and strategies to bring value to the business on time and on budget. Luftman (2000; 2003) established a definition on business-IT alignment as the appropriate and on time application of IT (Information Technology) in alignment with business strategies, goals and needs. The word alignment in business-IT is interchangeably used as harmony, integration, linkage, and strategic alignment (Luftman 2000; 2003; Norman 2010). Abdisalam, et al. (2010), used another word to represent business-IT alignment, which is strategic information systems alignment (SISA) and defines it as "an effective way of developing and maintaining the IS/IT systems that support the business operations". Henderson & Venkatraman (1999) on the other hand, built their own definition of strategic alignment on four basic areas of

choices; business strategy, IT strategies, organizational infrastructure and processes and IT infrastructure and processes.

The main goal of alignment of IT is to deliver business value on time and within budget. When the expected business values are not realized on time and within budget, the purpose of alignment in gaining competitive advantage will be defeated. And these expected benefits of IT investments on business are identified by the managements who use them as the yardsticks of measuring IT performance. According to Peppard et al. (2007), they said that success is measured by whether or not the new IT system delivered on time, within budget and meets the technical specifications, not necessarily on the degree to which the business explores the systems. This shows that the on time and within budget delivery of IT projects must be connected to the expected business values. They cited a case study of a bank that embarked on a customer relationship management system (CRM) with expectations to deliver range of benefits on investments, but did not realize the benefits. The expected benefits are; to increase customer retention rates, improve cross-sell opportunities, conversion of leads to sales, reduction of marketing campaign costs and to increase the regular quantity of products per customer. Although they claimed that the project was delivered on time, within budgets and according to specifications, but few of the mentioned benefits were realized. The information provided here, revealed that the benefits of business IT alignment varies with organizations' individual needs and projects.

According to Enrique (2003), he claimed that "the benefits of IT investment are potentially much richer, but at the same time, less clear and harder to predict". It is easier for management to propose certain expected benefits, but the processes to realize or evaluate them are quite ambiguous or difficult due to other complex factors that are connected to its realization or performance. He further claimed that this event is because most organizations give more focus to measuring the hard and quantifiable benefits that materializes on the organization's income statement rather than balancing them with the measuring of the soft, diffuse and qualitative impact.

These benefits are majorly identified and communicated out by the management earlier with detailed plans built around it to realize those benefits (Peppard et al. 2007). But when the needed practices or skills required to match the processes to fruitions are not in place, the benefits may get locked up in between, even if they are delivered on time, within budget and according to specifications. A small number of organizations engage in absolute or broad management procedure to make sure that they actualize the expected benefits from IT investments (Ward et al. 1996).

Enrique (2003) said the cost of IT investment is on a soaring scale and as such proper management is required to ensure that the investments deliver tangible economic value. That is, a management practice that will institute, create and realize IT investments on meeting the needs for efficiency and effectiveness (Earl 1992; Farbey 1993). Also the selection or adoption of best practices depends on the management's detailed understanding of various business functions. This is made possible when there is an effective collaborations and involvement among different stakeholders in the decision making process. Enrique (2003), identified four major categories for management to realize substantial benefits of IT investments on business, these comprise of; the return on investment, cost-benefit analysis, return on management, and information economics. These are further classified by Weill & Aral (2006) into four groups of investments; which are transactional, informational, infrastructure and strategic investments.

2.2.1 IT Investments Areas

- **Transactional Investments**

  This type of IT investment is basically channeled at cutting costs or to increase the throughput for the same cost (Weill & Aral 2006), by replacing capital for labor. It involves organization's payroll, accounts receivable and order entry that are automated (Weill 1992). From the transaction specific costs perspective, Chwo-Ming et al (2006) defined it as "those investments intended to support a specific manufacturer-supplier relationship". They are investments costs that bring synergy to the relationship between parties. Relating the specificity to investments of IT on business, they are those investments of IT directed to delivering value to specific function of the business that support the realization of the enterprise-wide strategic benefits. Over the time, this type of investment reduces the costs that are incurred in that particular function of the business. Hence the focal benefits of the transactional IT investments on business are on cost reduction. The benefits of this type of investment could be classified as cost benefit.

- **Informational Investments**

  This provides the information infrastructure to do other functions. According to Weill & Aral (2006), this type of IT investment provides information for purposes such as management, control, budgeting, production planning, accounting, reporting, compliance, communication, analysis and other management tasks. They offer the benefit of

access to information and communication that support business operations (Thompson et al. (2000). This type of IT investment provides the supports on which other functions are built and are expected to deliver good information systems or infrastructures to run business activities. Other related systems are electronic mail and communication gadgets (telephone, projectors etc.) (Weill 1992).

- **Strategic Investments**

The purpose and benefit of this IT investment on business is to gain competitive advantage through new markets generation or new products, services or business processes developments (Weill & Aral 2006). Ives & Learmonth (1984) posited that the overall benefit is to gain competitive advantage and increase market share through sales growth. Firms are beginning to see the importance of an excellence business or manufacturing process as a good strategy to gaining competitive advantage (Wheelwright & Hayes 1985).

This type of investment provides a good strategic fit for the improvement of business processes or activities. This is only achievable when organizations' practices support the proper alignment of IT systems with business strategies (Doll & Vonderembse 1987; Kim & Michelmen 1990). The example of this strategic IT investment is the introduction and adoption automated teller machines (ATMs) by the first set of banks, but later became transactional IT. Weill P (1992) claimed that the use of IT in a new way for an organization at that particular time could be referred to as strategic function. He further elaborated the difference in the strategic IT and transactional IT in terms of objectives. While strategic IT is majorly on expansion, transactional IT thrives on efficiency. The strategic IT benefits can be seeing as the technology enabler towards meeting the demand of the market, by creating new business for the organization, channel to the customers and acting as a pillar for organization reformation (Weill P, 1992).

- **Infrastructure Investments**

This represents the investment of IT on the shared IT services that use several applications such as, servers, networks, laptops, customer databases (Weill&Aral 2006). This is a new discovery because it is an addition to the other three types that which has been previously researched on. It provides platform flexibility for business idea in the future and as well cost reduction on long-term interoperations. The benefit of this type centers on long term cost reductions as the system invested on can provide

a platform for interoperability with other applications. So there will not be any need of buying separate systems for different applications.

2.2.2 Evaluation of Business-IT Alignment Benefits

It was observed that managers' decision on the investment of IT focus more on the material benefits, which often limit them from getting the full range of other potential benefits. There is need for proper evaluation of the all-encompassing benefits of IT on business in other to take full advantage of it. There seems to be huge gap between theory and practice in relations to the decision making process on what values are inherent in IT investments on organizations' business (Enrique 2003). This demands a good approach in balancing focus and evaluation on both the hard and soft benefits. The hard benefits are the quantifiable ones, while the soft benefits feast on the qualitative impact on business (Enrique 2003).

Hence, organizations will continue to be investing more on IT, expecting material returns on investment with no consideration for the immaterial benefits (Willcocks & Lester 1996). This calls for thorough evaluation of IT investment throughout the processes, not just the immediate outcomes. Due to various organizations' demands and structures, the IT investment evaluation is not static, it is dynamic. As a result, different organizations will have to invent, institute and execute IT investments that suit and produce operational efficiency and effectiveness (Farbey, 1993). It is equally possible for two organizations with the same level of investments on IT in terms of financial, human with similar management strategies not to produce similar results. Productivity or performance of IT depends on its conversion effectiveness (that is, rate to which IT investment is converted into assets). The higher the conversion rate of effectiveness, the greater the realization of benefits on IT investments. However, in the process model of IT benefits developed by Ward et al. (1996), they generally classify the process of evaluation benefits of IT investments into four extensive process models. These are;

- Identifying and structuring benefits
- Planning benefits realization
- Executing the benefits realization plan
- Evaluating and reviewing results

In the complete cycle of the processes, potential for further benefits can emerge. All of these process models of IT benefits are aimed at minimizing efforts and improving oper-

ating process performance, enhancing management support, gaining competitive advantage and providing good framework for business restructuring or transformation (Enrique 2003).

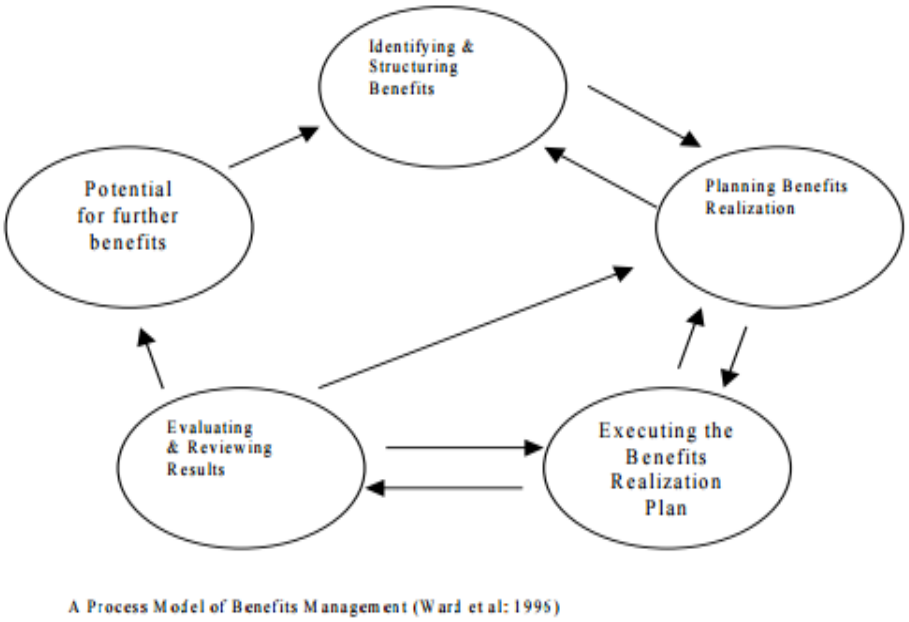

Figure 1: A Process Model of Benefits Management

The model proposed by Ward et al. (1996), suggests that IT implementation for the improvement of productivity in business is not sufficient for the realization of the expected benefits. Other factors are equally involved, which are more of managerial process and practices. They cited that IT only drives benefit opportunities and as result they recommended some benefits recognized in the model and developed business measure for every benefit recommended. The model revealed the connections that exist between IT implementation, business transformation and the general business outcome. This is a shift from present expected benefits by most managers, which is strongly inclined towards saving costs. Lubbe (1994) said that management information systems, business efficiency improvements and the ability to support business transformation and expansion are the major perceived benefits of IT. It was discovered that the consideration for financial benefits is attracting more attention and this is connected to the economic processes of all organizations. This shows that the current benefit structures by most managers are basically on cost value as return on investments. This is invariably depriving most organizations of other potential benefits ingrained in IT.

Hitt & Brynjolfsson (1996) also argued that the significance of investment on IT is majorly for productivity, profitability improvement and delivering of value to customers. Their arguments revealed that there is a need for a proper practical linkage between the

expected benefits and high business profitability to substantiate that IT could increase productivity. However, they claimed that there is a possibility for effective management of IT in organization to realize productivity benefits devoid of conversion of these benefits into profits. Furthermore, IT investments are used as important tools to sustaining competitive equality by some organizations, where gaining competitive advantage seems difficult.

2.3 Enterprise Architecture (EA) and Benefits on IT

Enterprise Architecture (EA) was said to be the driving force behind the alignment and integration of strategy, human resources, business and technology, as well as enterprise wide effectiveness (Eetu Niemi, 2006). Kaisler et al (2005) defined it as a "set of processes, tools and structures necessary to implement an enterprise-wide coherent and consistent Information Technology architecture for supporting the enterprise's business operations". Its model is required for the support of management and development of organizations, focussing on the business activities/operations, information systems as well as technological infrastructure. In general, EA is designed to bring improvement to the efficiency of principal investment in an encompassing way (technical, infrastructure, intellectual, etc.). Jonkers et al (2006) said that the benefits of the EA would not be realized, if organization would not commit to stringent planning and execution practices. Fraga & Llorens (2007) said there is need for managements to commit themselves to dynamic practices due to the changing demand of the working environment.

This posed major concerns for the senior managements on how to realize return on investments on IT practices in their various organizations. Richard Reese (2010) affirmed that organizations invest so much on IT for their business operations, but most of the time the senior managements do not seem to get their expected values on IT investments. He highlighted some of the reasons for failures in return on investments of IT. The reasons for these failures are distributed among different parties within the organizations. These include lack of business practices, improper alignments of various functions, wrong architecture, lack of proper or no governance of IT, and investments in wrong applications etc. Iyamu (2011) said it is of great importance that various organizational components synergize together for the survival of the organization. In his comparison between business and technical requirements, he argued that both are very critical to achieving agility in organizations through the implementation of EA. In addition to difficulties in benefits realization, there is equally no established model for the classification and evaluation of

the benefits of EA (Eetu Niemi & Tanja Ylimäki 2007). Although Giaglis (1999), proposed a model for the classification, which was applied by (Eetu Niemi, 2006) in categorizing the benefits into four classes, but he did not establish the relationship between them. In the research work conducted by Eetu Niemi (2006) through literature reviews and focus group interviews, he identified and developed an extensive list for the EA benefits, which was later classified into four categories. These are listed in figure 2 below.

Benefits of EA	Benefits of EA
Evolutionary EA development & governance	Improved staff management
Provides a holistic view of the enterprise	Improved strategic agility
Improved alignment to business strategy	Increased economies of scale
Improved alignment with partners	Increased efficiency
Improved asset management	Increased interoperability and integration
Improved business processes	Increased market value
Improved business-IT alignment	Increased quality
Improved change management	Increased reusability
Improved communication	Increased stability
Improved customer orientation	Increased standardization
Improved decision making	Reduced complexity
Improved innovation	Reduced costs
Improved management of IT investments	Shortened cycle times
Improved risk management	

Figure 2: The Benefits of EA Table

Eetu Niemi (2006) claimed that these benefits were categorized according to the classification model of information systems (IS) proposed by Giaglis (1999). He claimed that the basis for this model selection *"was its clarity, applicability and suitability"* which made it easy to categorize the benefits of EA based on *"measurability and the potential to attribute them to EA or EA work"*. He further pointed out the seven most cited EA benefits from both literature review and the focus group interviews he conducted. This includes; costs reduction, provision of a holistic view of the enterprise, business-IT alignment improvement, change management improvement, risk management improvement, interoperability and integration improvement and shortening of cycle times. He later combined a number of closely related EA benefits using the IS model to foster simplicity and clearness.

2.3.1 Categorization of the EA Benefits

Hard Benefits: These are quantifiable benefits that take the form of monetary values, times or other countable values, which can be accredited to EA or EA work (Eetu Niemi, 2006). They represent all the attributes that could be closely connected to cost reduction, short time cycle and other degree of economy values. He further stated that this goes further to improving standardization going by the model defined in EA, increasing reusability of architectural models, description and documentation, and enhancing systems interoperability according to EA standards.

Intangible Benefits: These are benefits that are not very easy to be quantified which are equally connected to EA or EA work (Eetu Niemi, 2006). They are benefits that come with the usage of EA designs, models and descriptions to aid enterprise development and give support to managerial activities such as making decision.

Indirect Benefits: These benefits equally represent the quantifiable ones, but have no direct link with EA or EA work (Eetu Niemi, 2006). They are the attributes that place an enterprise in better market position, enhance customer sense of direction, improve management and provide more efficiency to business processes.

Strategic Benefits: These correspond to the long-term positive benefits, which are entwined in various dynamic components (Eetu Niemi, 2006). Hence, they are usually not quantifiable as objectively as possible and cannot be totally ascribed to EA or EA work. These include improved stability in a constantly changing environment of an enterprise, improved strategic effectiveness and strategic alignment of business and IT.

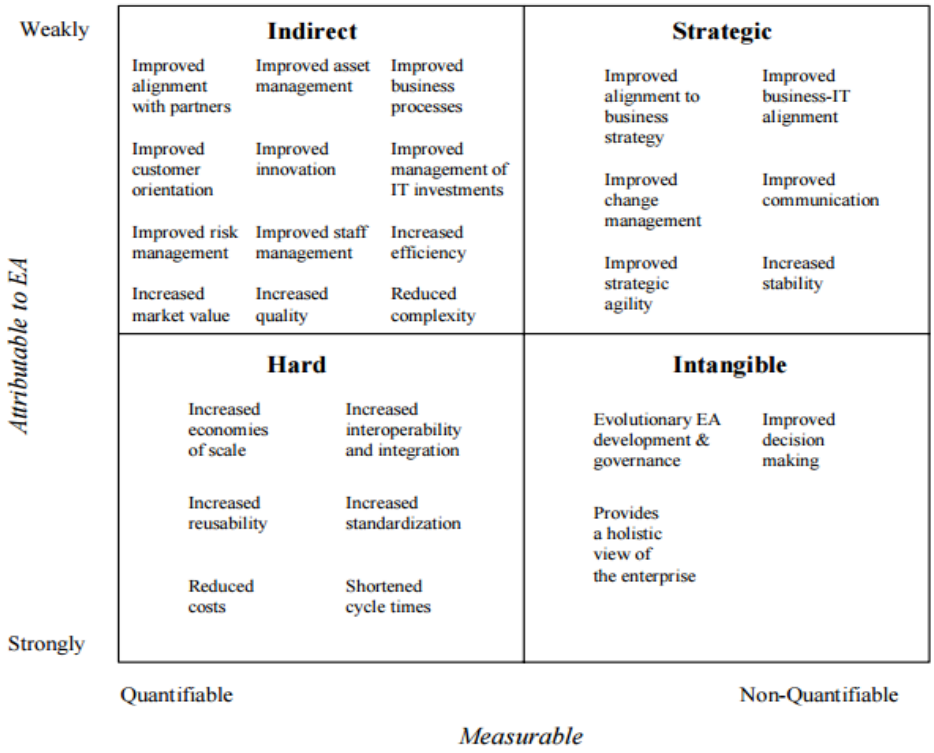

Fig 1. The EA benefits categorized according to the Giaglis et al. model

Figure 3: Categories of EA Benefits according to Giaglis et al. Model

2.3.2 EA Conformance Benefits

It is not sufficient to identify the benefits of EA for the organization without investigating the models that can be used to realize them. As in business-IT alignment, technology savvy alone cannot drive the expected benefits on IT investments; various units in the organization must take responsibilities to fulfill all the requirements of the models of the technology. In order for the benefits EA to be realized, EA practices must be adhered to by different parties within the organization (Boh & Yellin 2007; Foorthuis et al. 2009).

Boh & Yellin (2007) asserted that "*standards are useless without compliance*", nevertheless it is not as easy as it seems, and it demands that certain restrictions should be made as well as a shift from the existing practices. Foorthuis et al. (2010) identified some of the practices that should be followed by different parties within the organization. He categorized the EA conformance benefits into two levels and further described the components of each level. These include; the collective organizational benefits, and individual project benefits. Although the term used in their article has been modified for simplicity and clarity purpose, but the meanings remained the same. Some of these benefits can be linked to the ones enumerated by Eetu Niemi (2006).

2.3.2.1 Collective Organizational Benefits of EA

Core business objectives realization: It provides support for decision-making on strategic choice that is healthy for the enterprise wide operations, instead of the one that is local driven (Foorthuis et al. 2010). This does not stop various units and branches from pursing their individual interests. Lankhorst, et al. (2005), affirmed that an EA can establish the needed holistic view of the enterprise wide to balance various interests, because no organization stand to get any benefit from conflicting strategic choices or objectives. This invariably makes the effect of EA on business objects very to be indirect. However, EA is also perceived as a resourceful tool in the alignment of IT and business processes, an instrument for realizing benefits on IT investments in organizations (Bucher et al. 2006; Henderson & Venkatraman 1993; Lankhorst et al. 2005).

Solve complexity issues: EA gives adequate understanding to complexity of the organizational systems through business, information systems, applications and infrastructures (van Reaadt et al. 2004). Complexity comes from all the existing systems within the organization in which business operation is built on without a well-structured architecture that establish their mode of interactions. These complexities can be managed through a modular approach that establishes different functions of various systems, their interactions as well as their model of architectures (Lankhorst et al. 2005; Versteeg & Bouwman 2006).

Effective management of the organization environment: EA helps organizations to rapidly respond and adapt to the changing environments such as markets, customers' need and other interdependent business processes through the core business processes and systems automation. These changes in the business environments often create challenges for the IT units, for instance software updates, replacements and versioning. It ensures automation for business process that will respond promptly to the business environment situations. EA also establishes collaborations with other organizations (Jonkers et al. 2006).

2.3.2.2 Individual Projects Benefits

According to Foorthuis et al. (2010), the benefits of EA on organizational business is not confined to the enterprise wide boundaries, individual projects that conform to the demand of EA also derive some benefits. Among others are the following;

Project cost and time reduction: The expectations on IT investments are to deliver the expected values on time and within budget. Foorthuis et al. (2010), said projects that is

based on the model of EA is expected to save time and resources as the development activities are guided by its various systems' decisions. The model and decisions of EA are implemented in the early stage of the project not during the project (Capgemini 2007; Pulkkinen & Hirvonen 2005).

Project risk reduction and success improvement: Foorthuis et al. (2010) claimed that some resources discussed EA to be a tool for the identification and mitigation for project risks. Other arguments on EA benefits project risk revealed that it gives good understanding about the risks involved in project and timely strategy to prevent the risk based on the perspectives of EA models on the systems, processes and their connections with other projects (Bucher 2006; Capgemini 2007). Apart from mitigating risks in project, it also improves the possibilities of project success considering the fact that EA has dealt with challenges at the enterprise wide level (Capgemini 2007; Pulkkinen & Hirvonen 2005). This leads to increase in the quality and effectiveness of the project.

Catalyses the project initialization: EA helps in the decision making process in the early stage of the project which the project will later leverage on to deliver effectively. It provides a model for scoping the project and to put it in normal perspectives in order to avoid activities that are unnecessary for the development process (Bucher et al. 2006). This makes EA conforming projects to get initialized with speed.

2.3.2.3 EA Conformance Techniques

Management Involvement in EA: The effective implementation of EA requires the involvement of the management in the processes to enable it achieve the strategic business objectives (Morgan& Sage 2004). This involve good decision making, promptness to EA issues, setting goals, formal approval etc. (Van Steenbergen et al. 2010), because it is more than just delivering architectural results (Van Steenbergen et al. 2004), it involves several processes. Van der Raadt, et al. (2008), defined the EA processes as functions that are embodied with the creation, maintenance, ratification, enforcement and observation of EA schemes for decision making, established through governance and collaboration of different domains within the enterprise. This demand management to carefully make the right choice of the type of EA that will conform to the strategic objectives of the business (Foorthuis et al. 2010). Hence, it is imperative for the management to coordinate the people involved (IT personnel) who ensure that EA processes are following through for creating, maintaining and implementing EA models (Amour et al. 1999;2001) with the purpose of achieving the expected outcomes (Boh & Yellin 2007).

EA Conformance Assessment: This goes with proper monitoring of IT projects and other related concepts to ensure that they comply with the standards and constraints of EA, making use of the outcome to make better decisions (Boh & Yellin 2007; Foorthuis et al. 2009). Boh & Yellin (2007) further reiterated that governance mechanisms are needed to ensure that projects activities conform to architecture standards.

Active Environment for EA Knowledge Exchange: Active environments for EA practice provides platform for knowledge sharing and integration (Van Steenbergen & Brinkkemper 2009). This is revealed in a well-coordinated exchange of knowledge among the architects as well as between the project team and the architects. Foorthuis et al. (2010), claimed that some authors laid more emphasis on the active involvement of the architects in projects, due to the knowledge they can help infuse on the project by helping in the definition of necessary solutions and application of EA rules (Foorthuis et al. 2008, 2009; Wagter et al. 2006).Division in the knowledge exchange in the architectural domains on various architects could lead to the risk of fragmentation and misalignment (Foorthuis et al. 2010) and should be avoided.

Conformance Stimulations through Incentives and Sanctions: Performance on conformance can be stimulated through the use of incentives. This could further boost the eagerness to make the projects comply with EA rules e.g. using EA program to compensate for IT-costs conformance (cf. Foorthuis et al. 2010). In the other hand, the use of sanction is equally needed for any act that is against compliance to EA rules.

2.3.3 Principles for High Effectiveness in IT Organizations

Shpilberg, et al. (2007), observed that the replacement of IT personnel does not determine how effective an IT organizations will be, it could even make it worse as new staffs may not be familiar with the existing systems. In respect to their discoveries they came up with three critical principles essential for driving organization to high level of effectiveness.

Emphasizing Simplicity: The concept of simplicity was viewed as one of the core values of effectiveness of IT. For IT organizations to be sufficiently effective, their first priority focus must be on complexity reduction. Complexity reduction is invariably defined as a development and implementation of enterprise-wide standards, which includes system legacy replacement, add-ons elimination, and simplified and standardized infrastructure for new solutions. In their opinion it may require more investment of time and money that will generate lower cost. This pay off in the long run instead of building separate systems

for different purposes that will eventually build up complexity of interaction and communication.

Right Sourcing of Capabilities: IT organization thrives effectively when they are able to ward off traditional way of handling capabilities in terms of sourcing. It is important that IT organizations have a handful of capabilities varying from humans to systems and applications. Some of these capabilities maximize effectiveness only when they are outsourced to other vendors, except for some core business functions. It is better for organizations to choose the right source from varieties of vendors outside, rather than restricting themselves to in house resources at a very high cost demand. In house capabilities are the reasons why most organizations find themselves in the maintenance zone because they have different applications built on top of one another that must be serviced whether they are needed or not. But when some of these capabilities are outsourced to the right supplier/s, they only pay for the service when they use when needed. This will help in taking off some of the complexities that surrounds alignment and consequently maximizes the expected benefits (Shpilberg, et al. (2007).

Creating End-to-End Accountability: It will be very impossible for organizations to realize effectiveness if there is no one to be held accountable for the actualization of the expected values on time and within budget (Shpilberg et al. (2007). In their research they observed that nearly three-quarter of the IT project was not successful, due to inadequate supervision. It is not enough for IT project to be set out by the executives without proper monitoring of both the IT and business functions for accountability. Successful IT projects are entwined in effective communication among the concern parties, executives for progress assessment, line managers for the provision of IT resources, business units for effective practices and IT units for value delivery etc. Any breach in the gap could collapse the whole process.

2.4 Other Factors of Benefits Realization

2.4.1 Business Strategic Choices

The choice of strategy within an organization goes a long way in determining the business interactions with other functions within the organization and consequently impact on the

competitive advantage and other business value delivery. Michael (2000) further expatiated on the stance of strategic/value positioning as the means of achieving an enduring competitive advantage through the preservation of organizations' unique values. In other words engaging in activities that are uniquely different from the competitors, or doing similar activities differently from the competitors. This involves trading-off of some incompatible competitive activities for the enhancement of business value and profitability. When there is no right business strategy in place, every other thing will be out of place and working with other systems will be challenging. So it is very important for organizations to adopt the right strategies that will bring about the delivery of the expected business value. The choice of strategy depends on the perspectives of strategic management view implored by the organization.

2.4.2 Managing IT Portfolio

The change in innovation of IT and its complexity has resulted in the rapid increase in the organizational investments on IT. This growth in investments requires corresponding adequate management of the IT portfolio to be able to practically recognize, assess, prioritize and manage the risk, reward and value of IT on investment (Bryan M &Robert H, 2005). McFarlan (1981), said IT investment alone will not deliver the expected returns; a good management of IT portfolio must be in place for organizations to actualize and realize the benefits. IT portfolio management is a tool, procedure and practice that help interpret IT functions and capabilities into understandable terms for both business and IT executives and other concern parties within an organization. Bryan M &Robert (2005) said the goal of IT portfolio management is to deliver measurable business value, both tangible and intangible, with good alignment of business and IT strategy. They defined IT portfolio management as the combination of people, processes and relative information technology that communicates with appropriate agility, creates and catalogs a detailed risk assessment strategy, eliminates redundancies, and monitoring and measuring project plans.

Richard Reese, (2010), said that though many organizations have systems that can help manage IT portfolio, but it appears that many different parties within business and within IT groups view the difficulties in managing IT portfolio in different ways. Some organizations do not have centralized IT repositories (EA repositories) where they store IT portfolio. This makes different parties in need of information assets to put up their own IT repository that fulfills specific purpose within an organization e.g. change management database, fixed asset database, project portfolio management database, service registry

etc. So it is important for senior management together with IT managers to develop systems that will catch up with the growing complexity of IT to be able to manage IT portfolio effectively so as to deliver the expected business values. “IT management’s role has expanded into the formulation and development of the corporate strategic plan” (Bryan M &Robert H, 2005). They further stated that the most critical success factor in IT portfolio management comes from the communication and collaboration between IT and business units and other concern parties, i.e. partners, suppliers, customers, and distributors.

In order for this communication and collaboration to be effective there is need for IT Governance practice. Bryan & Robert (2005) defined IT Governance as a systematic relationship between information policy, processes, and people enacted to enable the freedom of thinking (innovation), decision making, and action (initiative) without compromising the overall objectives of the company. It is a system that guides and control IT portfolio within the organization to ensure different parties work together in fulfilling the enterprise wide objectives. They claimed that it focuses more on policy deployments (structures) and policy compliance (process). The yardstick in measuring the success of IT investment on business in IT portfolio are directly from the policies and principles generated and endorsed by the governance body. Consequently, IT portfolio management offers the structure, communication mode, and tools to support IT governance.

3 RESEARCH METHODOLOGY

This session focuses on the systematic way in which the research work was conducted. It will provide the detailed approaches to the research, explaining the step-by-step processes, techniques and methods that were involved in the research. By definition, a research methodology is a logical approach by which problems are solved through research studies (Kothari 2004; Rajasekar et al. 2013; Silverman 2000). That is, the process of given descriptions, explanations and predictions of phenomena in order to establish regularity of existence (Rajasekaret al. 2013).

The methodological choice of this research impacted on the research method that was used in executing this study. On the other hand, research methods are referred to as all the methods or techniques involve conducting the research study (Kothari 2004). He goes further to explain it as the "behavior and instruments used in selecting and constructing research techniques" such as tools for data recording, data processing and analysis etc. Invariably, research methods define the procedures, systems, and sequence of events involved in the research study, which represent the integral part of the methodology. The research methodology does not only consider the research methods but also the logic behind the methods selected and give explanation on the reason they are selected (Kothari 2004). It provides deeper understanding from the perspective in which the research study was conducted.

The research methodology used in this research study is purely quantitative method built on positivist philosophical stance. That is a philosophical stance (positivist) that holds a worldview that causes determine effects or outcomes, which is based on cautious examination and measurement of the objective truth that exists (Creswell 2014). The choice of quantitative method was based on the premise of the research method used in the data collection and the research techniques involved. The data were collected using a survey method, an excerpt from the Finnish IT barometer data that covers the annual survey results of IT significance to Finnish organizations as evaluated by business and IT professionals. Also the techniques required some statistical analysis using SPSS tool to analyze the Finnish IT barometer data on the possibility of business-IT alignment trap in terms of business value delivery by measuring, comparing the degree of certain variables and their distributions among various groups. The analysis was conducted based on variables collected from related literature reviews to either investigate the validity of existing knowledge or make discovery on new findings.

3.1 Quantitative Method

According to George et al. (2010), “the main reason for quantitative research is to establish a valid and objective description on phenomena”. It describes how phenomena can be controlled by manipulating variables. This makes the research study as objectively as possible by eliminating personal preferences on the research outcome. In respect to this, quantitative research method is perceived as the “historical, descriptive, correlation, casual-comparative, experimental, action research, and development” (Charles 1998). Zachariadis et al. (2013) described the role of quantitative methods within the confine of critical realism as descriptive and extensive which is used to evaluate events for the purpose of theorizing social policies built on consistency and the extent of association between the variables (Lawson 1994; Saunders et al. 2007).

It is built on the evaluation of numerical data through the use of statistical analysis methods and is more proficient in the testing of hypotheses (George et al. 2010). Creswell (2014) explained the concept of quantitative research in a more objective way, although not far from the previously stated knowledge, as "an approach use for testing objective theories by investigating the connection among the variables". The relationship among the variables are then represented and measured in numeric data format, which are then analyzed using statistical instruments.

This aforementioned knowledge clearly established the relevance of this research method on this research study. The research study is investigating reality of the theory posited by David Shpilberg et al (2007) on the existence of the business-IT alignment trap in Finnish organizations from the survey data provided. This will either support or refute the claim of the theory (Creswell 2014). The survey data is from the Finnish IT barometer data that covers the annual survey results of IT significance to Finnish organizations as evaluated by business and IT professionals. The IT barometer data was used to analyze possible business-IT alignment trap in terms of business value delivery by measuring and comparing the degree of certain variables and their distributions among various groups.

Also an extensive study was conducted on related articles in the literature review to discover relevant information about benefits of business-IT alignment and enterprise architecture as it relates to IT investments. The benefits of business-1T alignment investigated on the variables needed to measure the degree of alignment of IT with business. While the benefits of enterprise architecture on business investigated the variables needed to measure the degree of IT effectiveness or efficacy on business.

3.1.1 Survey Data Collection

As mentioned earlier, about the components of quantitative methods that it include historical, descriptive, correlation, casual-comparative, experiment, action research and development (Charles 1998). The focus of this research study is on descriptive and analytic design, which employs a survey data collection type. This gives a numeric description of trends, or opinion of IT investments and benefits by studying the samples of variables that are valid for the study (Creswell 2014). The primary aim is to analyze the trends that are evolving along with the present state (George et al 2010). Ghauri & Gronhaug (2010) defined a survey as a method of data collection that uses questionnaires. They claimed that it is a valuable instrument to get the opinions and descriptions and also to establish the cause-and-effect connections.

The barometer survey data provided were from predetermined questionnaires that cover different issues in IT organizations in Finland. Due to the scope of this research study, only some related data were extracted from it. That is, the survey questions that address the IT-alignment and enterprise architecture issues. They focus on alignment of IT with business strategies and the effectiveness of IT on business within organizations. Although some of the responses were in alphabet format, they were later coded into numerical formats for the purpose of analysis. The statistical analysis tool use to analyze the data was SPSS tool. Also both variance analysis and Chi-square test were used in performing the analyses.

4 FINDINGS

The purpose of this chapter is to draw out the connections between the reviewed studies and the analysis conducted with the Finnish barometer survey data. These findings are categorized into two namely; Previous results on alignment and effectiveness of IT, and research variables identification. It described the findings on the variables used in carrying out the research studies as well as the findings on the studies conducted by Shpilberg, et al. (2007).

4.1 Previous Results on Alignment and Effectiveness of IT

According to Shpilberg, et al. (2007), they said there have been many misconceptions about the nature of the IT. They identified that most often, the inability of IT to deliver as expected is not likely to be the subject of misalignment, but a composite of other complexities such as systems, applications and other infrastructures. These could as well include lack of IT savvy or lack of IT practices as required by the business units. The research they carried out revealed that high degree of alignment with the existence of some these complex systems, applications and infrastructures cannot deliver the expected benefits. In most cases management team don't consider the interaction of new IT project with other existing complex systems. Their decisions on the expected benefit that investment in certain IT resources should bring, captures only the immediate need of the business with no understanding on and consideration for the other mechanisms that will bring effectiveness and efficiency. "Focusing on high alignment of IT project by IT organizations will not automatically eliminate the existing complexity; rather it can compound it in certain situations" (Shpilberg et al. 2007).

In the survey they conducted on IT executives from different organizations, they realized that most IT organizations have IT capability that was neither highly aligned nor highly effective. Their growth rate was very low; they were performing below capacity and equally didn’t connect with the main business objectives and functions. Organizations that are neither aligned nor effective cannot realize any expected value on their investment on IT. They will keep spending more with no benefit to deliver. Organizations like this occupy the so called "maintenance zone". On the other hand, small percentage of those interviewed was of the opinion that their investment on IT was highly aligned with their core business functions, supporting their business strategies. The other small percent was of the opinion that the IT capability was highly effective with no complications with systems' complexity and delivered benefits as expected in time and within budget. The figure below gave a clearer picture of the outcome of their research.

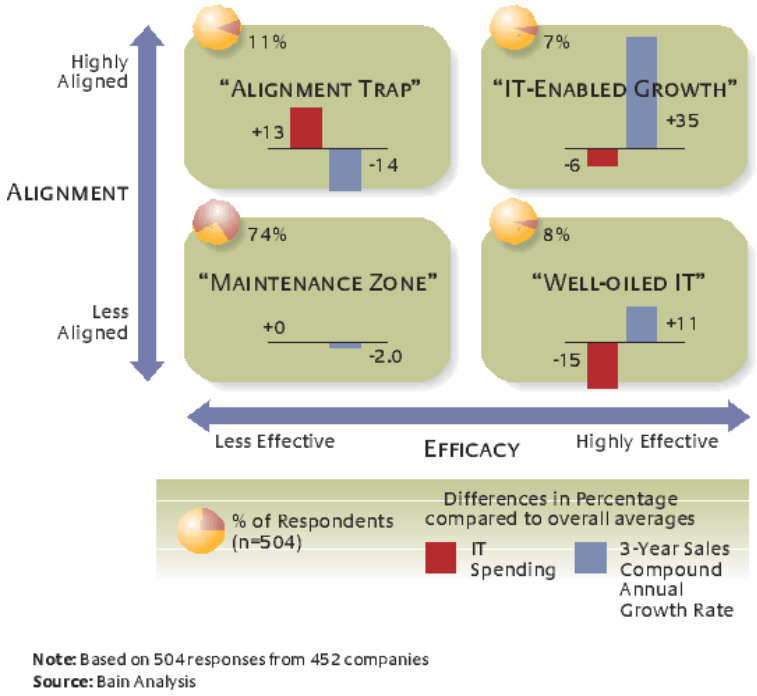

Figure 4: The Path to IT-Enabled Growth (Bain Analysis)

The issue alignment and effectiveness of IT in organizations were classified into four categories in the research conducted by Shpilberg et al (2007). The upper left corner on the quadrants revealed the "Alignment Trap". Organizations that occupy this space are highly aligned, but less effective. They are characterized with very high spending above budget with very low growth rate. Those in the "Maintenance Zone" are less aligned and less effective, their spending is within budget but not delivering the expected benefit, most organizations fall into this category. Their growth rate is low but not as that of the alignment trap. On the other hand, the lower right corners are the organizations that spend very low below the budget with considerably high growth rate. Although they are less aligned, but highly effective otherwise referred to as the "Well Oiled IT". The last category occupy the "IT-Enabled Growth", these are organizations that are characterized with considerably low spending (below budget) and very high growth rate. They are highly aligned and effective, but very few organizations have been able to attain this height.

This revealed that alignment of IT with business strategies alone couldn't deliver the expected benefits on IT investments. To enable growth and realize benefits on investments of IT, it is highly critical for IT organizations to first focus on effectiveness and then alignment rather than the opposite (Shpilberg et al. 2007). Most organizations are in the alignment trap because their first focus is centered on alignment without the adequate

understanding of the complexity of the systems, applications, infrastructures and other IT resources.

Effectiveness	Alignment
• Are our IT projects delivered on time, on budget and with IT functionality that is precisely what was requested (with appropriate modification) to gain desired business results? • Do our IT systems run smoothly and reliably? • Does our IT applications portfolio contain redundant applications that perform the same or similar functions? • Is our IT infrastructure consolidated in a few locations? • Do we outsource the right activities?	• Does our IT organization fully understand business priorities? • Are the priorities of our IT projects aligned with business requirements? • Does business actively participate in IT projects and investments? • Do our IT systems provide business with the right information, in the right form, at the right time, in the right place? • In managing critical IT functions (such as architecture and infrastructure), do we balance well the needs of the entire organization with those of individual businesses?

Figure 5: Diagnosis for Alignment and Effectiveness of IT

4.2 Research Variables Identification

In the previous research conducted by Shpilberg et al. (2007), that introduced the theory of alignment trap, it was observed that the theory was only tested with few essential variables that described the common benefits of alignment and effectiveness of IT. These dependent variables used in the analysis of the research they carried out are cost reduction and revenue growth variable factors. These were tested along with the independent variable factors of the alignment and effectiveness of IT respectively.

However, further literature reviews revealed some other important benefits that could be investigated alongside with the alignment and effectiveness of IT to test the validity of the theory. These were discovered in this research study and used as dependent variables in conducting this study. It was revealed that growing revenue generation and cost reduction on budgeting, marketing and IT related investments are the major benefits of alignment and effectiveness of IT on business (Peppard et al. 2007; Eetu Niemi, 2006), this are referred to as hard and quantifiable or financial benefits (Enrique 2003). Weill & Aral (2003), classified these investment benefits as transactional, informational, strategic and

infrastructure investments with each either focusing on cutting costs or improving revenue growth.

Hitt & Brynjolfsson (1996), revealed another important and significant benefits of investment of IT on business, which are majorly for productivity, profitability improvement and delivering values to customers. It was found out in their articles that there is a great connection between the expected business values and high business profitability to substantiate that IT could increase productivity. They invariably said that the factor of profitability is very significant to productivity and growth.

In respect to the literature reviews, these variable factors or benefits of alignment and effectiveness of IT were found to be very significant to the performance of IT on business. Although other factors were mentioned, but the variables of cost reductions, revenue growth and profitability appear to be the most talk about benefits in the reviewed studies. Hence, these three variables (i.e. cost reduction, revenue growth and profitability benefits) were used in testing the validity of the alignment trap theory using data collected from Finnish IT organizations. Profitability variable is the only variable included that is different from the previously conducted research by Shpilberg, et al. (2007), this is also to know how this will impact on the overall analysis.

These three variables were identified in the Finnish IT barometer survey data, alongside with the alignment and efficacy or enterprise architecture variables. Two independent variables each from efficacies and alignments were identified for results comparison, and were tested with dependent variable each from cost reduction, revenue growth, and profitability that were identified on the survey data. These are as follows;

- "In my organizations IT infrastructure, applications, data and processes establish a well integrated whole" (EfficacyK).
- "In my organization, business strategy, business models, operative model and IT architecture establish a well integrated whole" (EfficacyL).
- "In my organization, we develop systematically IT and IT management competencies needed to execute our business" (AlignmentM)
- "Based on reliable metrics we know well the benefits of IT management and its development as a strategic asset" (AlignmentAN).
- "How many percent did innovations and new businesses facilitated by IT increase the revenues of your organization last year (%)" (Revenue).
- "How many percent did increases in the efficiency facilitated by IT reduce the total costs of your organization last year (%)" (Cost).

- "How many percent did IT as a whole increase the profitability of your organization last year (%)" (Profitability).

5 DATA ANALYSIS

This chapter focused on data analysis which covers the data source, description of the data analyzed, how the data were analyzed (which includes coding, tools for the analysis, analysis, figures and tables) and the results of the analysis. The analysis is a parameter describing the characteristics of the alignment and effectiveness/efficacy of IT. Hence, it is a descriptive analysis that centred on Finnish IT organizations in issues relating to the alignment and effectiveness of IT. The data analysis was carried out with the aid of SPSS tool, which was used to perform chi square test and two-way ANOVA. The data source is a secondary data source from the Finnish IT barometer survey data 2014 conducted from predetermined questionnaires that cover different issues in IT organizations in Finland with total respondents of 249. The aim is to identify and select the issues that address the alignment and efficacy of IT on business, as well as those that concentrate on the variables required to perform the analysis as described in the findings chapter. These variables include revenue growth; cost reduction and profitability as some of the major benefits that alignment and enterprise architecture or efficacy of IT should deliver on business.

5.1 Description of the Data Coding

The responses to the independent variable data were ranked 1-7 (from low-high), while the responses to the dependent variable data were in percentages. A total number of the respondents from various IT organizations were 249. The ranking numbers represent the degree of agreement with the questions, where 1 = -3 totally disagree, 2 = -2 strongly disagree, 3 = -1 slightly disagree, 4 = 0 neither disagree nor agree (do not know), 5 = +1 slightly agree, 6 = +2 strongly agree and 7 = +3 totally agree. The required variables were first identified and selected from the Finnish IT barometer survey data and then recoded with the aid of SPSS tool to change their names for simplicity and clarity purpose as described below.

- "In my organizations IT infrastructure, applications, data and processes establish a well integrated whole" (EfficacyK).
- "In my organization, business strategy, business models, operative model and IT architecture establish a well integrated whole" (EfficacyL).
- "In my organization, we develop systematically IT and IT management competencies needed to execute our business" (AlignmentM)
- "Based on reliable metrics we know well the benefits of IT management and its development as a strategic asset" (AlignmentAN).

- "How many percent did innovations and new businesses facilitated by IT increase the revenues of your organization last year (%)" (Revenue).
- "How many percent did increases in the efficiency facilitated by IT reduce the total costs of your organization last year (%)" (Cost).
- "How many percent did IT as a whole increase the profitability of your organization last year (%)" (Profitability).

The independent variable data or responses, which represent EfficacyK, EfficacyL, AlignmentM and AlignmentAN, were classified into low and high categories. The low category defined by range of 1-4, coded as value 1 and high category defined by range of 5-7, coded as 2. These four independent variables were then analyzed in 2x2 matrixes, which identified the degree of relationships that existed between the two categories in four different analyses. That is, between high alignment and low efficacy (alignment trap), low alignment and low efficacy (maintenance zone), low alignment and high efficacy (well-oiled IT), and high alignment and high efficacy (IT-enabled growth). These relationships were later analyzed with each dependent variables i.e. revenue growth, cost reduction and profitability.

Additional analysis was conducted with a new variable created as sum of the efficacies and alignments. This gave rise to extra variables coding and naming. The new variables generated include the addition of EfficacyK and EfficacyL to produce EfficacySum and the addition of AlignmentM and AlignmentAN to produce AlignmentSum. These generated a new ranking from 2-14 (low to high) and were further classified into low and high categories following the above pattern. For this, the low category was defined by range of 2-9, coded as value 1 and high category defined by range of 10-14, coded as value 2. All analyses were carried out in 2x2 matrixes, given rise to five 2x2 matrix analyses in total.

5.2 Description of the Analysis

All the data were first analyzed through 2x2 matrix cross tabulation of the independent variables of the efficacies by the alignments. That is, EfficacyK*AlignmentM, EfficacyK*AlignmentAN, EfficacyL*AlignmentM, EfficacyL*AlignmentAN and EfficacySum*AlignmentSum. The cross tabulations were performed by SPSS software, analyzing them descriptively by choosing the statistical function of chi-square and percentages of the row, column and total. The 2x2 table of the analysis for each was generated, given the total numbers and the percentages of each cell that was defined into low and high category relationships. That is, the number and percentages of respondents that falls

in the between high alignment and low efficacy (alignment trap), low alignment and low efficacy (maintenance zone), low alignment and high efficacy (well-oiled IT), and high alignment and high efficacy (IT-enabled growth). The chi-square test revealed that the relationships are significant as they all produced 2-sided Pearson's asymptotic significant value of less than 0.001 ($p = < 0.001$).

The second analysis was conducted to know the averages of each of the dependent variable in each cell in all the five relationships of efficacies and alignments functions. This was executed by performing a two way ANOVA test that tested the averages of each of the dependent variable (Revenue, Cost and Profitability) on two independent variables of efficacies and alignments of the five relationships. To perform this analysis the function of univariate was selected in general linear model. And the data functions were descriptively analyzed respectively according to their dependent variable and the independent variables. This provided the averages of all the dependent variables represented in the 2x2 matrix relationships as defined by Shpilberg, et al framework. It also produced the overall averages of the five 2x2 matrix relationships tested that was used to define the differences in percentages of each dependent variable respectively.

These percentages were calculated mathematically defined by the equation of average of each dependent variable divided by the overall average of the matrix, multiply by 100 (e.g. (Average Cost ÷ Overall Average) * 100). Where 100% was the overall anchor percentage (overall percentage average) that defined whether a variable average percentage is above or below the overall percentage average. For instance if the percentage average of a variable gives a value higher than the anchor percentage, the difference in the percentages give the value above the average. On the other hand if the percentage average of a variable gives a value lesser than the anchor percentage, the difference in the percentages give the value below the average. In all, a total of fifteen (15) 2x2 matrix tables were generated in the analysis, three for each 2x2 matrix relationship tested.

5.3 Results of the Analysis

5.3.1 Result 1

The results of the first analysis conducted (i.e. analysis between EfficacyK and AlignmentM according to the table labels) were compared with the 2x2 analysis conducted by David Shpilberg et al (2007). The results revealed that approximately ten percent of the

respondents/organizations (9.6%) encountered alignment trap. The organizations represented here have high level of alignment of IT with business strategies and objectives but the effectiveness of IT is very low. Although they spend 42.6% less than the average company on IT investment and generate 43% revenue growth above the average company, but recorded 42% profits below the average company. Approximately nineteen percent of the respondents (19.3%) were on the maintenance zone, where less concentration was given to the alignment of IT with business objectives and strategies as well as IT effectiveness. Their IT spending was 39.6% less than the average company, yet still recorded a revenue growth and profitability lesser than the average company, 52.7% and 58.8% below the average respectively. While almost twenty-three percent (22.9%) of the respondents fall on the well-oiled IT region, showing that even with less alignment of IT with business objectives and strategies, organizations here still perform a little better than the other two categories due to very high IT practices or effectiveness. Although their IT spending was 11.5% below the average company and profitability 6.7% below the average, they still have at least 2.2% revenue growth above the average. The top right corner (i.e. the IT-enabled growth) recorded very high performance. Approximately forty-eight percent (48.2%) of the respondents have very high very high alignment of IT with business objectives and strategies and as well have very good practices of IT (effectiveness) to ensure that it delivers benefits as expected. They recorded IT spending of 28.8.8% above the average, and have tremendous outcome of 4.8% revenue growth and 32.9% profitability above the average company.

ALIGNMENT	High	24 9.6%	120 48.2%
	Low	48 19.3%	57 22.9%
		Low	High
EFFICACY			

Figure 6: 2X2 Matrix of EfficacyK * AlignmentM

ALIGNMENT	High	**Revenue** = 11.10 **Cost** = 2.65 **Profitability** = 2.87	**Revenue** = 8.13 **Cost** = 5.95 **Profitability** = 6.58
	Low	**Revenue** = 3.67 **Cost** = 2.79 **Profitability** = 2.04	**Revenue** = 7.93 **Cost** = 4.09 **Profitability** = 4.62
		Low	High

EFFICACY

Figure 7: The Averages of EfficacyK * AlignmentM with Revenue, Cost and Profitability

Overall Average for Revenue = 7.76
Overall Average for Cost = 4.62
Overall Average for Profitability = 4.95

ALIGNMENT			
	High	**Revenue** = 43.0% above **Cost** = 42.6% below **Profitability** = 42.0% below	**Revenue** = 4.8% above **Cost** = 28.8% above **Profitability** = 32.9% above
	Low	**Revenue** = 52.7% below **Cost** = 39.6% below **Profitability** = 58.8% below	**Revenue** = 2.2% above **Cost** = 11.5% below **Profitability** = 6.7% below
		Low	High
EFFICACY			

Figure 8: The % difference in Averages of EfficacyK * AlignmentM on Revenue, Cost and Profitability

5.3.2 Result 2

The second analysis was conducted between EfficacyL and AlignmentM. It was observed that exactly eight percent of the respondents (8%) were ensnared in the alignment trap, due to the fact that they give more focus on the alignment of IT with business objectives with very little attention given to the IT practices or effectiveness. Their IT spending was 31.6% below the average which produces a revenue growth of 24.6% above the average, but recorded 47.9% below the average. IT projects is highly align with business objectives but lack effective execution to deliver the expected benefits. Approximately twenty-six percent (25.7%) of the respondents were in the maintenance zone. These organizations give less attention to the alignment of IT with business and IT effectiveness. They recorded IT spending of 35.9% below the average; revenue growth and profitability were lesser than the average company, 35.6% and 55.6% below the average respectively. On the lower right corner, 16.5% of the respondents experienced well oiled IT. Despite the fact that their revenue growth was 2.3% below the average at the IT spending of 6.1% below the average, they still recorded 9.3% profitability above the average. Roughly fifty

percent (49.8%) of the respondents recorded outstanding performance in the IT-enabled growth region. They have high level of alignment of IT with business objectives and IT effectiveness. Although their IT spending was 25.1% above the average, they still account for 7.9% revenue growth above the average and yielded 33.3% profitability above the average.

ALIGNMENT	High	20 8.0%	124 49.8%
	Low	64 25.7%	41 16.5%
		Low	High
EFFICACY			

Figure 9: 2x2 Matrix of EfficacyL * AlignmentM

ALIGNENT	High	**Revenue** = 9.67 **Cost** = 3.16 **Profitability** = 2.58	**Revenue** = 8.37 **Cost** = 5.78 **Profitability** = 6.60
	Low	**Revenue** = 5.00 **Cost** = 2.96 **Profitability** = 2.20	**Revenue** = 7.58 **Cost** = 4.34 **Profitability** = 5.41
		Low	High
EFFICACY			

Figure 10: The Averages of EfficacyL * AlignmentM with Revenue, Cost and Profitability

Overall Average for Revenue = 7.76

Overall Average for Cost = 4.62

Overall Average for Profitability = 4.95

ALIGNMENT			
	High	**Revenue** = 24.6% above **Cost** = 31.6% below **Profitability** = 47.9% below	**Revenue** = 7.9% above **Cost** = 25.1% above **Profitability** = 33.3% above
	Low	**Revenue** = 35.6% below **Cost** = 35.9% below **Profitability** = 55.6% below	**Revenue** = 2.3% below **Cost** = 6.1% below **Profitability** = 9.3% above
		Low	High
EFFICACY			

Figure 11: The % difference in Averages of EfficacyL * AlignmentM on Revenue, Cost and Profitability

5.3.3 Result 3

The third analysis was conducted between the EfficacyK and AlignmentAN to know the variation in percentages of the four categories. It was observed that just a small percent (6.4%) of the respondents were caught up in the alignment trap due to high alignment and low efficacy of IT. Their IT spending was 4.1% below the average; they recorded a revenue growth of 31.7% above the average, but had a decline in profitability of 10.1% below the average company. On the maintenance zone, 22.5% of the respondents were represented in this region as a result of low alignment of IT with business and its efficacy. They had IT spending of 52.4% below the average, but still had declines in both revenue growth and profitability of 40.3% and 65.3% respectively. On the other hand, relatively high value was recorded on the well-oiled IT region recording a total of 33.3% of the respondents. In this region, the organizations have fairly good performance on their profitability, recording a total of 8.9% above the average on IT spending of 11.9% below the average, but record a decline in revenue growth of 30.8% below the average. This is performance was due to the high level of IT effectiveness they practice, regardless of the fact that the alignment of IT with business was low. In the IT-enabled growth region, 37.8% of the respondents have very high alignment of IT with business objectives as well as very high level of effectiveness of IT. Although, their IT spending was 20.1% above the average company, but recorded a very good performance on the revenue growth and profitability, 32% and 30.5% respectively.

ALIGNMET			
	High	16 6.4%	94 37.8%
	Low	56 22.5%	83 33.3%
		Low	High
EFFICACY			

Figure 12: 2x2 Matrix of EfficacyK * AlignmentAN

ALIGNMENT			
	High	**Revenue** = 10.22 **Cost** = 4.43 **Profitability** = 4.45	**Revenue** = 10.24 **Cost** = 5.55 **Profitability** = 6.46
	Low	**Revenue** = 4.63 **Cost** = 2.20 **Profitability** = 1.72	**Revenue** = 5.37 **Cost** = 5.17 **Profitability** = 5.39
		Low	High
EFFICACY			

Figure 13: The Averages of EfficacyK * AlignmentAN on Revenue, Cost and Profitability

Overall Average for Revenue = 7.76
Overall Average for Cost = 4.62
Overall Average for Profitability = 4.95

ALIGNMENT			
	High	**Revenue** = 31.7% above **Cost** = 4.11% below **Profitability** = 10.1% below	**Revenue** = 32.0% above **Cost** = 20.1% above **Profitability** = 30.5% above
	Low	**Revenue** = 40.3% below **Cost** = 52.4% below **Profitability** = 65.3% below	**Revenue** = 30.8% below **Cost** = 11.9% above **Profitability** = 8.9% above
		Low	High
EFFICACY			

Figure 14: The % difference in Averages of EfficacyK * AlignmentAN on Revenue, Cost and Profitability

5.3.4 Result 4

The fourth analysis was conducted between EfficacyL and AlignmentAN and was used to investigate the percentage variations of the averages of each dependent variable (Revenue, Cost and Profitability) each category (i.e. Alignment trap, maintenance zone, well-oiled IT, and IT-enabled growth). In this analysis, approximately five percent (5.2%) of the respondents were ensnared in the alignment trap, due to the high focus given to alignment of IT with business objectives at the expense of good IT practices or effectiveness. Their IT spending was 32% above the average company, which produced 53.1% of profit below the average but recorded 34.4% revenue growth above the average company. In the lower left corner, more organizations entered the maintenance zone where less concentration was given to the alignment of IT with business and efficacy of IT. They recorded a percentage of 28.5% of the respondents, whose IT spending was 47% below the average, but had very low outcome on their revenue growth and profitability, valued 33.1% and 60.2% below the average respectively. On the well-oiled IT region, 27.3% of the respondents have good performances in their organizations regardless of the low alignment of IT that exist with business objectives due to the high level of IT effectiveness they practice. Although their revenue growth was 33.8% below the average on IT spending of 22.3% below the average company, they still recorded 22.8% profitability above the average company. Thirty-nine percent (39%)of the respondents had a very high performance of IT in their organizations as a result of the high alignment of IT with business objectives as well as high level of IT effectiveness in those organizations. They recorded a revenue growth of 31.6% above the average and 22.8% of profitability above the average company.

ALIGNMENT	High	13 5.2%	97 39.0%
	Low	71 28.5%	68 27.3%
		Low	High
EFFICACY			

Figure 15: 2x2 Matrix of EfficacyL * AlignmentAN

ALIGNMENT			
	High	**Revenue** = 10.43 **Cost** = 6.10 **Profitability** = 2.32	**Revenue** = 10.21 **Cost** = 5.27 **Profitability** = 6.45
	Low	**Revenue** = 5.19 **Cost** = 2.45 **Profitability** = 1.97	**Revenue** = 5.14 **Cost** = 5.65 **Profitability** = 6.08
		Low	High
EFFICACY			

Figure 16: The Averages of EfficacyL * AlignmentAN on Revenue, Cost and Profitability

Overall Average for Revenue = 7.76
Overall Average for Cost = 4.62
Overall Average for Profitability = 4.95

ALIGNMENT			
	High	**Revenue** = 34.4% above **Cost** = 32.0% above **Profitability** = 53.1% below	**Revenue** = 31.6% above **Cost** = 14.1% above **Profitability** = 30.3% above
	Low	**Revenue** = 33.1% below **Cost** = 47.0% below **Profitability** = 60.2% below	**Revenue** = 33.8% below **Cost** = 22.3% above **Profitability** = 22.8% above
		Low	High
EFFICACY			

Figure 17: The % difference in Averages of EfficacyL * AlignmentAN on Revenue, Cost and Profitability

5.3.5 Result 5

The last analysis was performed between EfficacySum and AlignmentSum, these were generated from the summation of the two efficacy variables, that is, EfficacyK + EfficacyL and the summation of the two alignment variables, that is, AlignmentM + AlignmentAN. A very low percentage of the respondents were entrapped in alignment trap, recorded a value of 4% due to high level of alignment with low attention given to the effectiveness of IT. They had an amazing revenue growth that valued 57.2% above the average on IT spending way below the average as well 38.5%, but had poor profitability

outcome that account for 29.7% of the average company. On the maintenance zone, 33.3% of the respondents were captured in here, having low focus for the alignment and effectiveness of IT. Their IT spending was 33.6% below the average, but had a very low performance on the revenue growth and profitability, recording percentages of 43.9% and 57.8% respectively. Approximately thirty percent (29.7%) of the respondents experienced well oiled IT, with IT spending of 5.4% below the average. Although they recorded 5.4% revenue growth below the average, they still had an outstanding performance of 20.8% profitability above the average. This performance in profit returns can be attributed to high effectiveness of IT, because the alignment of IT in this region is assumed to be low. On the IT-enabled growth corner where high effectiveness and high alignment of IT are assumed, 32.9% of the respondents were in this region. Although their IT spending was 42.2% above the average, they still had very high performances of 24% of revenue growth above the average and 40.4% profitability above the average.

ALIGNMENT	High	10 4.0%	82 32.9%
	Low	83 33.3%	74 29.7%
		Low	High
EFFICACY			

Figure 18: 2x2 Matrix of EfficacySum * AlignmentSum

ALIGNMENT	High	**Revenue** = 12.20 **Cost** = 2.84 **Profitability** = 3.48	**Revenue** = 9.62 **Cost** = 6.57 **Profitability** = 6.95
	Low	**Revenue** = 4.35 **Cost** = 3.07 **Profitability** = 2.09	**Revenue** = 7.34 **Cost** = 4.37 **Profitability** = 5.98
		Low	High
EFFICACY			

Figure 19: The Averages of EfficacySum * AlignmentSum on Revenue, Cost and Profitability

Overall Mean for Revenue = 7.76

Overall Mean for Cost = 4.62

Overall Mean for Profitability = 4.95

ALIGNENT	High	**Revenue** = 57.2% above **Cost** = 38.5% below **Profitability** = 29.7% below	**Revenue** = 24.0% above **Cost** = 42.2% above **Profitability** = 40.4% above
	Low	**Revenue** = 43.9% below **Cost** = 33.6% below **Profitability** = 57.8% below	**Revenue** = 5.4% below **Cost** = 5.4% below **Profitability** = 20.8% above
		Low	High
EFFICACY			

Figure 20: The % difference in Averages of EfficacySum * AlignmentSum on Revenue, Cost and Profitability

The result of this analysis, that is, the EfficacySum and AlignmentSum are closely related with the other analyses conducted. This further validates the outcome of this reserch study in this frame of analysis.

6 CONCLUSION

In conclusion the theory of alignment trap was investigated using the framework of the previous study created by David Shpilberg et al (2007). In this study it was observed that the number of organizations in the alignment trap zone were lesser than the previous study, which revealed that the concept is not as prevalent in Finnish IT organizations as described in the earlier study. Also there are regular variations in the variable components of each zone when compared with the earlier study. This shows that the theory is not completely true in Finnish IT organizations. These variations are described below.

The Finnish IT organizations on the alignment trap zone had their IT spending below the average company, with very low profitability, but had very good performance on their revenue growth. This was contrary to the previous study, that showed that organizations on this zone had high IT spending but produced low revenue growth, except for EfficacyL and AlignmentAN whose IT spending was very high, but still recorded similar outcomes with other Finnish organizations in this zone. The Finnish organizations on the maintenance zone generally had poor performances in all the analyses conducted compared with the previous study. Their IT spending were very below the average company, in spite of that, they recorded very low profitability and very low revenue growth.

The Finnish IT organizations on the well-oiled IT zone had variation in their performances but very close to good performance in that almost all the organizations had break even profitability outcome compared with their IT spending. This was contrary to the previous study whose IT spending was below the average with good performance of revenue growth. While on the IT-enabled growth zone, Finnish organizations spend more on IT investments but had tremendous performances way above the average in terms of profitability and revenue growths. Unlike the previous study which showed that, their IT spending was almost close to the average company but recorded very good revenue growths.

Generally it was observed that Finnish organizations with high effectiveness of IT performed very well in all the analyses, while organizations with low effectiveness of IT, experienced low performances, especially in terms of profitability regardless of the degree of IT alignment with business objectives and strategies. This was also the case in the previous study. It is note-worthy to point out that the previous study measured performance by the degree of revenue growth companies experienced in each zone, but in this study performances were majorly determined by the degree of profitability that investment in IT yielded in the long run, although revenue growth also played important role in the evaluations.

Summarily, in respect to this study, the theory of alignment trap is partly true for Finnish IT organizations, and could be avoided by raising the level of effectiveness of IT in various Finnish IT organizations. High level of IT practices or effectiveness played a huge role in the realization of business benefits on IT investment and could strengthen the cord of alignment of IT with business objectives and strategies. Another confirmation about partly true of alignment trap in Finland is seen in the number of Finnish IT organizations that were ensnared in it, they were very minimal compared with the previous study. Although the number of sample investigated was lesser in number (249) compared with the previous study (504).This could be improved upon by investigating the theory with relatively large number.

Conclusively, the entire study also supported the notion made by the previous studies review that the alignment of IT with business performance cannot deliver the expected benefit on IT investment alone, there must be good practices of IT in place (enterprise architecture). This is an environment that demands the interoperability of systems, applications, minimizes complexities and engenders the commitment of various personnel involved in fully carrying out IT requirements or standards that will deliver the benefits of IT on business more efficiently.

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