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ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS & ECONOMICS
DEPARTMENT OF MANAGEMENT
MBA PROGRAM

IT-Business Alignment: The Case of Ethiopian Airlines

By

Elsa Taddele

March 2019

Addis Ababa, Ethiopia

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**A Thesis Submitted to the School of Graduate Studies of Addis Ababa
University in Partial Fulfillment of the Requirements for the Degree of Master
of Business Administration**

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DEDICATION

*This work is dedicated to my newly born Son **Dagmawi Begziabher** who adds a unique and wonderful flavor to the life of our family!*

And above all, to the Almighty God!

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Oh God! You are faithful! Even though I passed through a lot of ups and downs to accomplish this work, you gave me all the strength, wisdom, guidance, and grace to finalize it! Thank you God! I trust you, I love you, I honor you, and all glory is yours! Amen!

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ABSTRACT

AS IT is becoming the driving force behind relentless change in the business world, organizations are continuously investing on IT both to stay in business and win ever-changing competitive challenges. The benefits of IT can be manifested in the form of reduced costs, enhanced products and services, delighted customers with diversified and personalized services and also strengthened partnership and supply chain management. While business is becoming unthinkable without leveraging IT, scholars argue that IT enable and drive the business if it is aligned with the business strategy. In other terms, to benefit from the potential of technology in highly dynamic business environment, such as an airline industry, IT-business alignment is critical success factor.

Based on literature review and the researcher's preliminary assessment, it is noted that the management of IT-business alignment maturity practices are gray area for Ethiopian airlines as there is no defined measurement metrics. Additionally, as anecdotal information indicates the employees are not satisfied with the quality of the IT systems they are using in their respective sections. Due to this, IT investments are not delivering the intended business value. The IT systems are not well integrated to provide seamless business flows and customers are not getting personalized service as the airline industry is currently practicing. Thus, this paper aims to assess the IT-business alignment maturity in Ethiopian airlines.

The general approach of this research is a case study in which a combination of quantitative and qualitative methods has been used to collect and analyze data. Based on extensive literature review, a research model was established which constitutes six constructs adopted from previous literature: communication, competency/ value measurement, governance, partnership, scope and architecture, and skills. It is attempted to enrich the research model by conducting an interview with 5 IT and business professionals who are experts in this area. Based on the interview, a construct named IT investment is added. The survey questionnaire and interview outline contents were prepared based on the defined research model by partially adapting from existing literature and developing additional ones as required. The quantitative aspect of the study involved 218 employees from various departments of the organization with different job positions, roles, and work experience. In the qualitative study, Business strategy, IT strategy, SLAs were analyzed.

The overall IT-business alignment maturity of Ethiopian airlines is 2.92 which is within the range of level 2 (beginning/ committed process) with partial fulfillment of level 3 maturity (Established Focused process). The result of the document analysis revealed that the corporate business and IT strategy are formulated in aligned manner from the perspective of content, validity and completeness. However, as the finding of the quantitative analysis revealed that the implementation of the already formulated strategy has several limitations which can be seen from the overall maturity level which is 2.92 out of 5. Moreover, the role and benefit of IT should be escalated from business enabler (reducing costs and leveraging investments) to business driver which helps to enhance products and services, enhance executive decision making and also reach the customers. Besides this, Enterprise Architecture should be designed and implemented as already mentioned in the IT strategy document in order to ensure the enhancement of IT-business alignment.

Keywords: IT-business Alignment; strategic IT management; IT-business alignment maturity; Strategic alignment between IT and business; business/IT strategy alignment

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LIST OF ACRONYMS

CAF – Confirmatory Factor Analysis

CIO – Chief Information Officer

CMM – Capability Maturity Metric

HR – Human Resource

IT – Information Technology

PCA – Principal Component Analysis

SAM – Strategic Alignment Model

SAMM – Strategic Alignment Maturity Model

SPSS – Statistical Package for Social Science

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

In today's competitive business environment, organizations are striving to leverage Information Technology (IT) in order to stay in business and further win the stiff competition (Chan et al., 2006). In line with this, organizations are making substantial amount of IT investment with the aim of increasing their business performance (Ucakturk & Villard, 2013). IT is changing the way organizations articulate their business processes, deliver their products and services, communicate with their customers and also compete in the business arena (Avolio et al., 2000; Chebrolu & Ness, 2013). However, several scholars argue that IT investments bring the intended business value if the organization has aligned its IT strategy with the business strategy and vice versa (Alaceva & Rusu, 2015; Henderson & Venkatraman, 1993; Luftman, 2012; Ullah & Lai, 2013e). Henderson and Venkatraman (1993) further argue that due to lack of alignment between IT and business, organizations face failure in realizing value from their huge IT investments. In line with this, the importance of alignment is growing as businesses strive to harmonize IT and business taking into account dynamic business strategies and constantly evolving technologies (Sledgianowski & Luftman, 2005).

Scholars argue that, the alignment represents different level of abstraction. On the one hand, alignment of IT with the business is realized when the business goals are in harmony with IT goals at strategic level. On the other hand, at the functional level of analysis, IT-business alignment occurs when the business processes and activities are in harmony with the organization's information systems that are automating the business (Coltman, 2015; Henderson & Venkatraman, 1993 & Luftman, 2012). The concept of IT-business alignment has been explained using several terms including 'fit' (Venkatraman, 1989), 'linkage' (Henderson & Venkatraman, 1993), 'integration' (Weill & Broadbent, 1998), 'fusion' (Smaczny, 2001), 'harmony' (Luftman, 2012) between IT and business. Business and IT alignment defined in different ways by different scholars. However, literatures indicated that the core concept of IT-business alignment captures

the idea of coordinating activities across business and IT domains within the organization in such a way that provide improvement of business processes, new services, and enhancement of decision making which ultimately increase the business value of the firm (Luftman, 2012).

For more than three decades, the necessity and desirability of aligning business needs and IT capabilities has been considered as one of the top ten key issues of Chief Information Officers (CIO) in their effort of IT management (Henderson & Vendatraman, 1993; Luftman et al., 2006; Luftman, 2009; Luftman, 2012; Ullah & Lai, 2013e; Chebrolu & Ness, 2013). This is due to the fact that, in today's organizations, IT has taken a more strategic role rather than facilitating administrative activities (Alaceva & Rusu, 2015; Henderson & Venkatraman, 1993; Luftman, 2012). On the one hand, researches have shown that organizations that successfully align their business strategy with their IT strategy outpace those organizations that are non-aligned (Byrd et al., 2006; Luftman et al., 2008). On the other hand, failure of IT-business alignment could result in failed IT investment initiatives and wasted resources leading to organizational failure in terms of finance and objective achievement (Henderson & Venkatraman, 1993; Chen et al., 2010; Ravishankar et al., 2011). To this effect, establishing metrics and evaluating organization's hr Business-IT alignment is paramount.

In line with this, organizations have been assessing their IT-business alignment maturity level with different tested models. This is due to the fact that, the assessment provides a means to evaluate where an organization is in the context of IT-business alignment maturity model (Luftman et al., 2008; Brodbeck, Rigoni, and Hoppen, 2009). In other terms, gauging the maturity helps to understand where the organization is and also defines where an organization needs to go to attain and sustain IT-business alignment. Moreover, it is critical to ensure achieving business value from the huge IT investments of businesses in general and an airline industry in particular. Consequently, the assessment of an organization's alignment maturity is a vital step in identifying the specific set of actions required to ensure IT is being used to properly enable and/or drive the business strategy. Accordingly, establishing Business-IT alignment and assessing its continuous improvement in customer service dependent organizations, such as in airline industry is crucial. This helps to warrant IT and business strategies adapt effectively and efficiently with each other.

Airline industry is working in a highly dynamic environment and under cut-throat competition that requires endurance to sail through the market turbulence. The dynamic nature of the business

necessitates fast responsiveness to the market, particularly to the ever changing customer needs and tastes. In addition, the competition is global which triggered collaboration that is currently being manifested in the industry with strategic partnership and alliances¹.

The success of an airline emanates from how quickly and flexibly respond to changes in customer demand, an uncertain business environment and competitors' challenges; which basically relies on effective and efficient leverage of IT that is aligned with the business strategy.

Ethiopian Airlines successfully achieved its vision 2010 and is currently endeavoring to achieve "Vision 2025", a 15-year strategic plan that has been exercised and realized for the last nine years. Currently, the organization is structured with seven strategic business units (SBUs) or profit centers: Ethiopian Domestic and Regional Airline, Ethiopian Passenger Airline, Ethiopian Cargo, Ethiopian Maintenance and Repair Overhaul (MRO), Ethiopian Aviation Academy, Ethiopian In-Flight Services and Ethiopian Ground Services. In line with its performance achievements; Ethiopian joined the biggest alliance, Star Alliance, in December 2011².

In this study, Ethiopian Airlines is considered for the case study to research about its IT-business alignment maturity. Ethiopian Airlines is selected for the case study since the company has a huge IT investment every year in order to stay in business and further win the stiff competition of an airline industry. In line with this, improving IT-business alignment maturity helps to leverage IT with the aim of business value achievement. The other reason is, as Ethiopian Airlines is a global organization with a flavor of both international and local organizational cultures with an intensive use of IT other Ethiopian firms can learn a lot from the output of this study. Moreover, the researcher works for about 10+ years in the organization with Information system development and management experience which can positively contribute to the success of the research. The main reason that the study focused on IT-business alignment is due to the fact that return on

¹ Ethiopian airlines official website
<http://www.ethiopianairlines.com/en/corporate/history.aspx> (accessed on June 07, 2018)

² Ethiopian airlines official website
<http://www.ethiopianairlines.com/en/corporate/history.aspx> (accessed on June 07, 2018)

information systems' investments and subsequent business results can be gained if and only if they are aligned with the business strategy.

1.2. Statement of the Problem

AS IT is becoming the driving force behind relentless change in the business world, organizations are continuously investing on IT both to stay in business and win ever-changing competitive challenges (Ucakturk & Villard, 2013). The benefits of IT can be manifested in the form of reduced costs, enhanced products and services, delighted customers with diversified and personalized services and also strengthened partnership and supply chain management. While business is becoming unthinkable without leveraging IT, scholars argue that IT enable and drive the business if it is aligned with the business strategy (Alaceva & Rusu, 2015). In other terms, to benefit from the potential of technology in highly dynamic business environment, such as an airline industry, IT-business alignment is critical success factor.

The capability to manage IT-business alignment evolved as businesses' essential component to render effective and efficient service for the business customers. Accordingly, IT-business alignment is no longer a choice rather has become a survival issue. Surveys on IT management have consistently ranked the lack of alignment as one of the top organizational challenges. In line with this, scholars view IT-business alignment as a pervasive and persistent problem in today's business world (Alaceva & Rusu, 2015; Chan, Sabherwal, & Thatcher, 2006; Luftman, 2008).

Based on literature review and the researcher's preliminary assessment, it is noted that the management of IT-business alignment maturity practices are gray area for Ethiopian airlines as there is no defined measurement metrics. Additionally, as anecdotal information indicates the users are not satisfied with the quality of the IT systems they are using in their respective sections.

Due to this, IT investments are not delivering the intended business value. The IT systems are not well integrated to provide seamless business flows and customers are not getting personalized service as the airline industry is currently practicing. Even though the number of passengers boarded is growing in recent years, Ethiopian airlines is struggling to turn increased revenue into profits. The company's profit margin, which is only single digit, remains weak due to the increased competition, high fuel and running costs and lack of realizing business value out of huge IT

investment. As a result, the airline business is always under pressure which demands not only investing a huge resource on IT but also ensuring the realization of business values (Atalik & Arslan, 2009). Since it is one of the gray area, IT-business alignment practices should be studied.

Currently, there are limited researches on IT-business alignment that are conducted in the context of Ethiopia. Girma (2013) conducted a case study examining IT and business strategy alignment and its impact on the performance of selected banks in Ethiopia. Abdulselem (2017) researched on IT-business alignment maturity by conducting multiple case study at commercial, Dashen and Awash banks. King (2018) examined IT and business alignment gap in anonymous organization and attempted to design an architecture to bridge the gap. However, even though the title indicates addressing the strategic alignment gap bridging, the study mainly focused on the tactical relationship between IT and business in the context of gathering a requirement and developing software systems to the business. Despite these studies, local research attempts did not address IT-business alignment in the context of airline industry.

Moreover, the above mentioned studies didn't attempt to contribute identifying additional constructs that determine IT-business alignment in the context of the case organizations in particular and Ethiopia in general. In line with this, the above mentioned local IT-business alignment researches recommended further study to be conducted in other industries other than financial banking sectors. As recommended by the above local papers, this study addressed assessing IT-business alignment maturity in airline industry specifically in Ethiopian airlines. Besides, this study attempted to identify additional construct that affect IT-business alignment maturity in the context of the case organization.

Organizations have been assessing their IT-business alignment maturity level with different tested models. This is due to the fact that, the assessment provides a means to evaluate where an organization is in the context of IT-business alignment maturity (Luftman et al., 2008). Among this, Luftman's strategic alignment maturity model (SAMM) is widely used and dominant model (Luftman's maturity model has been reported by several authors (Ekstedt et al., 2005, Cumps et al., 2006; De Haes and Van Grembergen, 2008; Luftman, 2007).

Given the importance of IT resources to executing business and the need for IT-business alignment, this study attempted to objectively investigate IT-business alignment with respect to communication, competency/value measurement, governance, partnership, scope and architecture, & skills. Accordingly, knowing the current IT-business maturity level would help the organization as guidance and also to define roadmap on how to improve to higher level of maturity and serve as baseline for future maturity measurements.

This research study is geared towards studying IT-business alignment maturity in Ethiopian airlines. The study recommended IT-business alignment roadmap to improve the alignment maturity to the next higher level which helps to maximize the utilization of huge IT investment and also achieve the targeted business value in Ethiopian airlines. To achieve this objective, the following research questions are explored.

1. What is the level of IT-business alignment maturity in Ethiopian airlines based on IT-business alignment maturity model?
2. How IT strategy contributes towards successful implementation of business strategies and help achieving business strategy?

1.3. Objective of the Study

1.3.1 General Objective

The general objective of the research is to measure the level of IT-business alignment maturity in Ethiopian airlines.

1.3.2 Specific Objectives

In order to achieve the general objective of this study, the following specific objectives are identified:

- to identify IT-business alignment maturity model that fits Ethiopian airlines
- to assess the level of IT-business alignment maturity with respect to each of the identified constructs
- to measure the maturity of IT-business alignment in Ethiopian airlines
- to assess how IT strategy contributes towards the success and achievement of business strategy

1.4. Significance of the Study

In today's competitive environment, usage of IT has played a key role in the business success model. Due to this, utilization of IT is regarded as a major determinant of productivity and achieving competitive excellence (Byrd et al., 2006).

In addition to being an academic exercise to fulfill the requirement of the MBA program, this research is believed to produce results that can improve the IT-business alignment in Ethiopian airlines, other sectors and organizations which in turn helps to achieve the value for money, reduces the risk of failure and maximizes business value achievement out of huge IT investments.

The results of this research can be used as input to define an alignment roadmap based on IT-business alignment maturity model that identifies necessary actions to help moving to the next higher maturity ladder ensuring that IT is being used as an enabler and further a driver of the business strategy.

Another important significance of the study is that the result can be used as a baseline for future IT-business alignment studies and assess the progress with in a given range of timeline. Besides, this study can provide an input for other researchers to further study with additional IT-business alignment constructs that determine the maturity, which in turn helps to come up with a better output.

1.5 Scope of the Study

This study focused on determining IT-business alignment maturity level in Ethiopian Airlines and propose recommendations for improvement. Thus, the main aim of the research is to examine existing IT-business alignment initiatives in Ethiopian airlines, evaluate the maturity using one of the tested alignment maturity model, and analyze the findings to forward recommendations for improvement.

1.6 Limitations of the Study

The limitations of the research could be that the input data for the analysis is restricted to single case, Ethiopian Airlines. The result would have been more holistic for high level abstraction of Airline Industry if it could include other airlines input as benchmarking. Moreover, the accessibility of recent literatures that are published with in the last five years is limited which ultimately affects the researchers' understanding of the area and the current research findings.

1.7 Organization of the Thesis

This thesis report is organized into five chapters. Chapter one, the present chapter, is a general introduction to the problem and includes the objective of the research along with the significance and scope of the study. Chapter two is devoted to literature review. It discusses concepts of IT-business alignment in two sections. In the first section, the basic concepts of IT-business alignment are discussed in sufficient detail. In the second section, related literatures from international and local sources are reviewed and presented. In chapter three, the research methodology is described. Data presentation, analysis and discussions are presented in chapter four. Finally, chapter five presented general conclusions and recommendations along with future research directions based on observations and results from the study.

CHAPTER TWO

LITERATURE REVIEW

2.1. Overview

In this chapter the theoretical background of IT-business alignment is discussed based on the availability of previous scientific researches. In addition, IT-business alignment related literatures are reviewed to analyze existing research and to clearly show the research gap to justify the significance of this study.

With the aim of searching for literature to understand the theoretical background of IT-business alignment, the researcher attempted to retrieve various articles. The search parameters and synonyms that were used to logically guide the search engines are indicated in table 1. Some of the key words are Business strategy, IT strategy, IT Systems' Quality, IT-business alignment, Business-IT alignment, IT-business alignment models, IT-business alignment maturity models, the impact of IT-business alignment on Business success, IT value proposition in the business, and Alignment of IT with the business. At the second stage, the researcher identified literatures that are related to IT-business alignment. The articles were searched in Google, Google Scholar, Emerald Insight and IEEE using keywords mentioned above.

Table 1: Keywords used for searching literatures

Keywords Used for Searching Related works
Business Strategy
IT Strategy
IT systems Quality
IT-business alignment
Business-IT alignment
IT-business alignment models
IT-business alignment maturity models
The impact of IT-business alignment on Business success
IT Value proposition in the business
Importance of IT to the business
Alignment of IT with the business

2.2. Importance of IT to Business

Nowadays, being competitive depends on leveraging IT to market and deliver products/services, communicate with customers, innovate new products/services which ultimately helps to provide cost leadership and differentiated services (Ucakturk & Villard, 2013). In other terms, organizations' businesses are becoming highly dependent on IT (Luftman, 2012). In line with this, scholars have emphasized this concept by stating that failure to leverage IT may seriously affect an organizations performance, competitiveness and ultimately viability (Avison, Jones, Powell, & Wilson, 2004; Avolio et al., 2000).

According to Bruce (1998), failure to align IT with Business decreases the IT creditability and hinder the achievement of corporate goals through IT investments. Willcocks (1994) acknowledged the value and the impact of IT on the firm's profitability and efficiency and identified four domains that can be affected by the leverage of IT. These are competitive advantages, cost base efficiency, product / service delivery, operational feasibility, and capacity to manage businesses. Consequently, it can be seen that IT has progressed from simply supporting operational functions and administrative support to being a critical strategic organizational resource not only to support chosen business strategies, but also to create new business strategies (Alaceva & Rusu, 2015; Henderson & Venkatraman, 1993; Luftman, 2012).

A typical example of business transformation through IT can be using smartphones, analytics, big data, cloud services, and business intelligence which allow organizations to compete in new ways and also new entrants to disrupt traditional way of doing business. Generally, IT has become a major organizational resource for realizing business strategy; driving to create a new business model; and also creating disruption in product-market choice which leads to developing new products/services, innovation and competitive advantage (Ucakturk & Villard, 2013).

2.3. Business Strategy

Organization's business strategy is goal-directed and actions oriented in which an organization matches its capabilities and resources with opportunities and threats in its environment. In view of that, there are three basic levels of strategies. These are corporate, competitive, and functional levels.

The corporate level defines the business of the organization and its future direction with respect to achieving its vision. The competitive level defines how an organization competes in its chosen business arena. Functional level defines what resources and capabilities organizations have to support the corporate and competitive strategies (Cragg, King, & Hussin, 2002).

Porter (1985) highlights the essence of business strategy as an organization's ability to intentionally choose a set of activities that will convey distinctive mix of values to its customers. According to Henderson & Venkatraman (1983), business strategy consists of formulation, implementation and evaluation phases of product-market choice. To sum up, business strategy lays its focus on long term key business directions by specifying the competitive advantage it will provide to the organization (Dubey, 2010).

2.4. IT Strategy

IT strategy shows the extent to which IT is adopted in the business. As business strategy, IT strategy can also be an enabler and a driver if the organization follows an innovative attitude towards adoption of IT (Huang & Quig, 2007). In earlier days, IT had a support role. However, in today's business environment, IT is playing a strategic role. Consequently, it leads to developing new products/services, innovation and competitive advantage, which, in turn, can lead to better company performance (Luftman & Kempaiah, 2007).

The role of IT is evolving from what new technologies are needed to how those technologies can be applied to promote innovative business strategies which support IT-business alignment. Accordingly, as organizations endeavor for innovation, IT is expected to provide visionary insights into what is possible with IT, rather than delivering what is needed by the business (Luftman, 2017). Further, different scholars indicated that, IT should be capable of managing information assets in such a way that the business manages other tangible resources. Moreover, IT should serve as strategic business partner and deliver significant business transformation and innovation (Huang & Hu, 2007; Seigerroth, 2011; Luftman, 2017). As an operational definition, IT strategy is an iterative process to align an organization's IT capabilities with its business requirements; and its role is to provide effective, efficient, responsive and flexible systems to meet the current and future business requirements (Dubey, 2010).

2.5. The Concept of IT-Business Alignment

The need of aligning business needs and IT capabilities has been considered as one of the top ten key issues of IT management for more than three decades (Henderson & Vendatraman, 1993; Luftman et al., 2006; Luftman, 2009; Luftman, 2012; Ullah & Lai, 2013e).

Different scholars used different terms such as ‘harmony’, ‘link’, ‘fit’, ‘match’, ‘integrate’, ‘fuse’ to define alignment (Venkatraman, 1989; Henderson & Venkatraman, 1993; Weill & Broadbent, 1998; Smaczny, 2001; Luftman, 2012). One of the first definitions for alignment was proposed by Henderson and Venkatraman (1996), as the degree of fit and integration among four fundamental domains which are: business strategy, IT strategy, business infrastructure and IT infrastructure. IT-business alignment is also defined as continuous, conscious and logical process of interconnecting all components of an organization in order to contribute to its performance. In other terms, alignment is defined as the degree to which the mission, objectives, and plans contained in the business strategy are shared and supported by the IT strategy (Reich & Benbasat, 1996). Based on Luftman and Brier (1999), the basic principle of alignment is defined as an appropriate harmony of business strategies, goals, and needs with IT strategies, goals and actions. In a study published a year later, Luftman (2000) redefined alignment as not only how IT is in harmony with the business, but also how the business should, or could be in harmony with IT which reveals an equal focus on the business strategy as well as the IT strategy.

According to Alaceva and Rusu (2015), IT-business alignment will be realized when IT and business executives collaborate to create and adapt their strategies together and also working together in order to realize the intended goals.

IT-business alignment promotes a paradigm shift towards the role of IT function in an organization from support to business enabler and driver. Thus, aligning IT objectives to the business strategy has become paramount in order for the organization to stay in business and become competitive in the market space (Chan et al., 2006). The IT literature investigated not only the influence of business on IT strategies but also IT on business strategies which leads to better efficiency, cost reduction, improved relationships with customers & suppliers, product/service innovation and enhancement of new business opportunities (Luftman, 2012). Moreover, scholars state that IT-business alignment is required not only at strategic level but also at operational level which represents the actual day to day activities of the organization.

According to Singh and Woo (2009), the strategic objectives should be clearly understood by employees so that they can act in sync with organization goals. This indicates the importance of alignment not only in strategic level but also on operational level (day-to-day activities). In line with this, Tarafdar and Qrunfleh (2009) states that an organization with less devotion to operational level alignment faces a problem during the execution of the strategy formulated at strategic level.

2.6. Strategic Alignment Model

Research organizations, academics, consultants, and practitioners have identified IT-business alignment as prevalent and persistent problem for the last three decades (Luftman et al., 2012). Accordingly, scholars proposed various alignment models in various times in order to address this problem (Hu & Huang, 2005; Luftman, Lewis & Oldach, 1993; Henderson & Venkatraman, 1993). Among these, Henderson and Venkatraman's (1993) model has been considered as a pioneer by researchers (Bicknall, Darrell, Nilson & Pessi, 2007; Lee, Kim, Paulson & Park, 2008). This model is made up of four fundamental domains of strategic choice: the business strategy, IT strategy, organizational infrastructure and processes, and IT infrastructure and processes. In this model, alignment is explained from the perspective of organization's internal and external domain. On one hand, the external domain indicates the external environment in which the business races and chosen set of business strategies that are explained in the business strategy such as cost leadership or product/service differentiation. On the other hand, the internal domain indicates the decisions regarding the organizational structure and design, revision of business processes, development of products and skills within the organization (Henderson & Venkatraman, 1993).

According to Henderson and Venkatraman (1993), there are two types of integrations between IT and business domains. These are the strategic integration and the operational integration. The strategic integration shows the link between business and IT strategy reflecting the external components. In other terms, this integration indicates the capability of IT functionality to both shape and support business strategy. The operational integration exhibits the corresponding internal linkage between organizational infrastructure and processes and IT infrastructure and processes. Strategic alignment model demonstrates four dominant relationships between the business strategy, IT strategy, organizational infrastructure & processes, and IT infrastructure and process domains as illustrated in Figure 1.

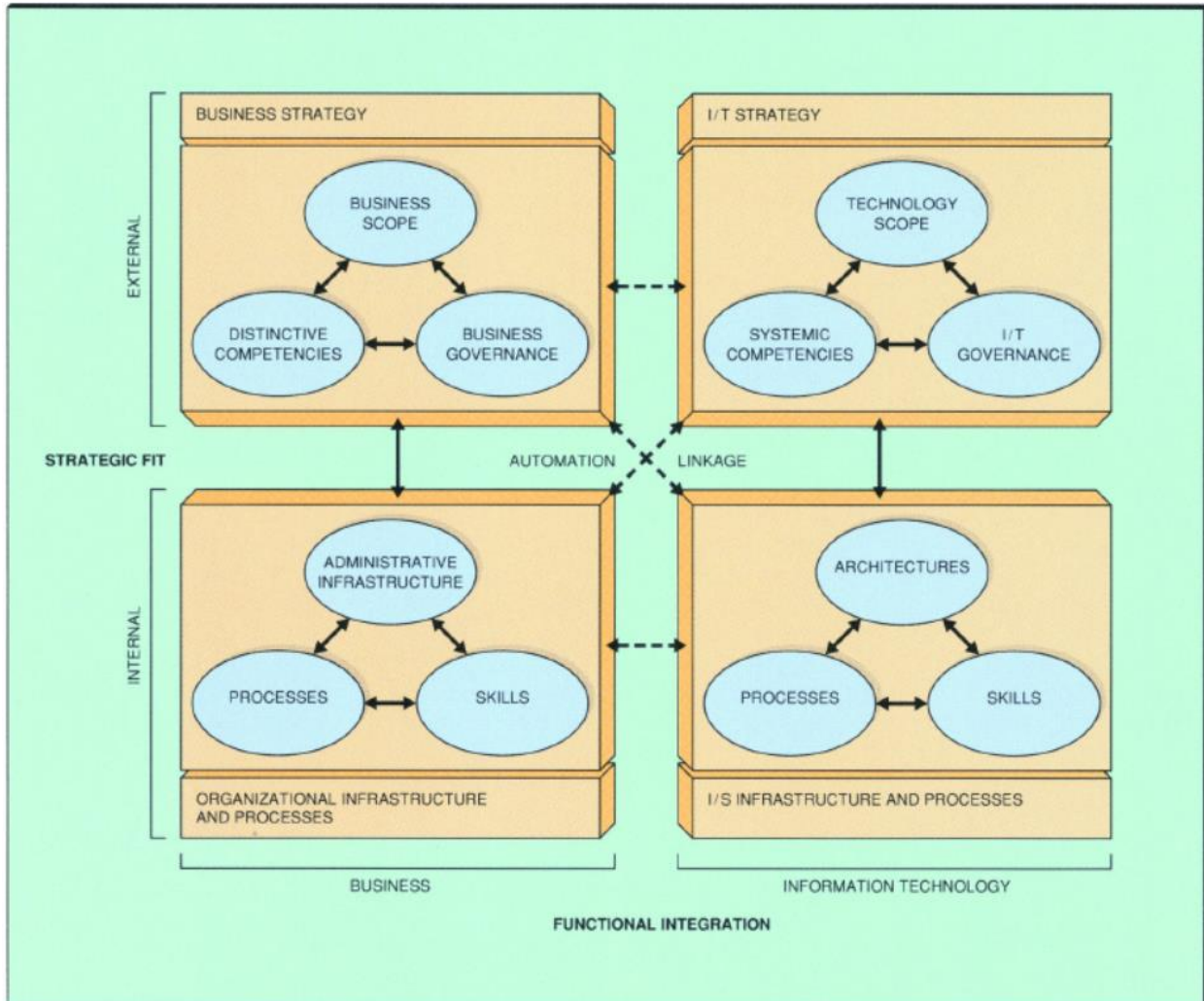


Figure 1: The Strategic Alignment Model (Henderson and Venkatraman, 1993)

The Strategic Alignment Model is considered as the foundation for many studies on alignment (Avison et al., 2004). However, it is considered as a high-level conceptual map that is weak and has no practical real-world application. In other terms, it does not provide variables or instrument on how to measure and evaluate alignment in the real organizations context (Marques Pereira & Sousa, 2003). In line with this, Avison et al. (2004) indicated that “there is little in the literature at present that explains what a manager should do with this model other than understand them conceptually” (p. 234). Hence, alignment related empirical studies usually adopt other models that are the extensions of the Strategic Alignment Model (Mekawy, Rusu, & Ahmed, 2009).

2.7. Strategic Alignment Maturity Model

The Strategic Alignment Maturity (SAM) model, designed by Luftman (2000) is the most dominant and empirically practical model in the context of IT-business alignment (El-Masri, Orozco, Tarhini, & Tarhini, 2015). This model provides the constituting factors of IT-business alignment along with levels of organizational maturity.

Luftman (2009) argued that maturity model provides a practical way to interpret complex concepts into organizational capabilities; offer guidance for action plans, delivers awareness for continuous improvement and also monitoring mechanism for IT-business alignment.

The SAM model identifies key enablers and management practices that are required to be performed by an organization in order to ensure IT-business alignment (El-Masri, et al., 2015). In the model, Luftman defines six constructs that determine IT-business alignment. These constructs are: communication, Competency/ value measurement, governance, partnership, scope & architecture and skills (Luftman, 2000). These constructs are further discussed as below:

Communications maturity

Luftman (2000) articulates the importance of the exchange of ideas and understanding among IT and business team. This criterion determines how well the technical and business staffs understand each other. It also measures the frequency and ease of connection they have. Besides this, it evaluates how organizational learning is disseminated internally. Moreover, it measures how effectively the organization communicates with partners, consultants, and vendors.

Competency/ Value measurement maturity

This criterion determines how well the IT team demonstrates value to the business in terms that the business understands. It depicts usage of balanced measurements to demonstrate the contributions of the IT division to the business in terms that both the business and IT understand and accept. It also evaluates how the organization measures the value of its projects and also the lessons learnt after the completion of the projects.

Governance maturity

This criterion determines how the business and IT team formally discuss and review allocation of IT resources along with their priority. It also evaluates how clearly the decision making authority is defined to make IT related decisions and also what processes IT and business managers use at strategic, tactical and operational levels to set IT priorities to allocate resources.

Partnership maturity

This criterion measures how IT and business perceives the contribution of the other and the trust among both team members. It also evaluates the sharing of risks and rewards among the team. Partnership is expected to grow to a level where IT both enables and drives business process and business strategy changes.

Scope & Architecture maturity

This criterion evaluates the extent to which IT goes beyond the back office and enables the front office of the organization. It measures how IT is enabling and driving the business to grow, competes and profit.

It assesses how IT evaluates and adopts emerging technologies effectively and also measures the provision flexible infrastructure based on the business need. Moreover, it measures how IT is able to provide customized solutions to ever changing customer needs.

Skills maturity

This criterion evaluates all of the human capital concerns going beyond traditional considerations such as training, salary, and performance issues of the organization. It considers the organization's cultural and social environment. It measures the extent to which the staffs have the skills needed to be effective. It also measures how the employees feel personally responsible for the business innovation.

On the one hand, it measures how well the IT staff understands business drivers and speaks the language of the business. On the other hand, it measures how well the business staff understands important technology concepts. Moreover, this criterion evaluates to what extent the organization leverage the staff's innovative ideas and entrepreneurship initiatives.

As can be seen in Figure 2, each of the constructs further consists of variables that need to be studied with respect to alignment maturity measurement.

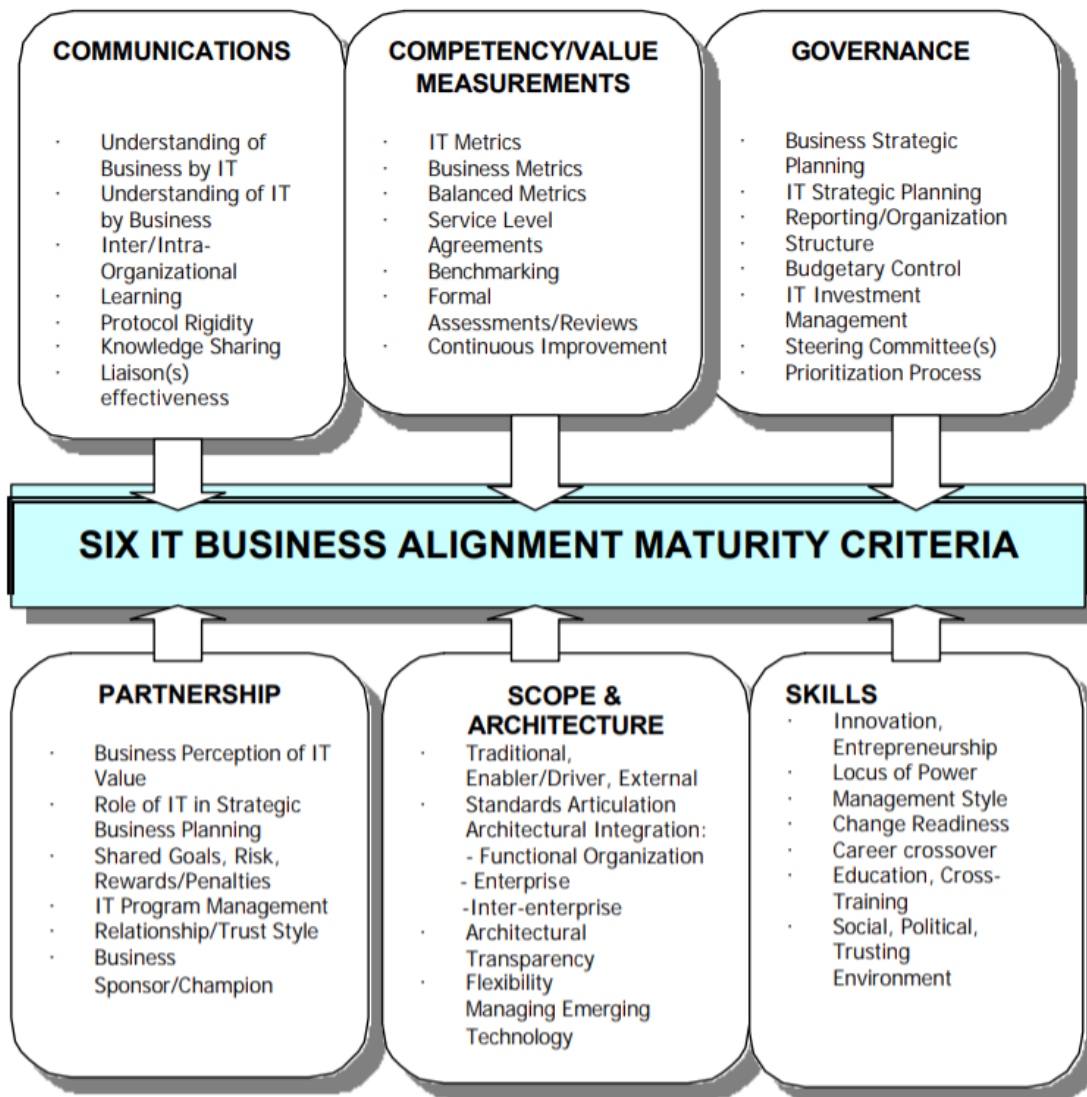


Figure 2: The Strategic Alignment Maturity Model (Luftman, 2000).

2.8. IT-Business Alignment Maturity Assessment

In the concept of IT-business alignment maturity, the level of maturity represents an organization's capability to align the business and IT needs. Luftman (2000) proposes the evaluation of the degree of an organization's IT-business alignment maturity through communication, value measurement, Governance, partnership, scope and architecture and skills constructs, where each criterion is measured using a five-level scale of maturity tailored for the factors. These five maturity levels

draw on the core concepts of the Software Engineering Institute's Capability Maturity Metric (CMM), but the focus here is solely on IT-business alignment. Accordingly, the five maturity levels are discussed as below. It is also demonstrated in Figure 3 which shows how each criterion's maturity can be translated into and also the overall alignment maturity of the organization.

Level 1: Initial or ad-hoc processes

Organizations at Level 1 generally have poor communications between IT and the business and also a poor understanding of the value or contribution the other provides. Their relationships tend to be formal and rigid, and their metrics are usually technical rather than business oriented. Service level agreements tend to be sporadic. IT planning or business planning is ad-hoc. And IT is viewed as a cost center and considered "a cost of doing business." The two parties also have minimal trust and partnership. IT projects rarely have business sponsors or champions. The business and IT also have little to no career crossovers. Applications focus on traditional back-office support, such as e-mail, accounting, and HR, with no integration among them. Finally, Level 1 organizations do not have an aligned IT business strategy.

Level 2: Committed processes

Organizations at Level 2 have begun enhancing their IT business relationship. Alignment tends to focus on functions or departments (e.g., finance, R&D, manufacturing, marketing) or geographical locations (e.g., U.S., Europe, Asia). The business and IT have limited understanding of each other's responsibilities and roles. IT metrics and service levels are technical and cost-oriented, and they are not linked to business metrics. Few continuous improvement programs exist. Management interactions between IT and the business tend to be transaction-based rather than partnership based, and IT spending relates to basic operations. Business sponsorship of IT projects is limited. At the function level, there is some career crossover between the business and IT. IT management considers technical skills the most important for IT.

Level 3: Established, focused processes

In Level 3 organizations, IT assets become more integrated enterprise-wide. Senior and mid-level IT management understand the business, and the business's understanding of IT is emerging. Service level agreements (SLAs) begin to emerge across the enterprise; although the results are not always shared or acted upon. Strategic planning tends to be done at the business unit level,

although some inter organizational planning has begun. IT is increasingly viewed by the business as an asset, but project prioritization still usually responds to “the loudest voice.” Formal IT steering committees emerge and meet regularly. IT spending tends to be controlled by budgets, and IT is still seen as a cost center. But awareness of IT’s “investment potential” is emerging. The business is more tolerant of risk and is willing to share some risk with IT. At the function level, the business sponsors IT projects and career crossovers between business and IT occur. Both business and technical skills are important to business and IT managers. Technology standards and architecture have emerged at both the enterprise level and with key external partners.

Level 4: Improved, managed processes

Organizations at Level 4 manage the processes they need for strategic alignment within the enterprise. One of the important attributes of this level is that the gap has closed between IT understanding the business and the business understanding IT. As a result, Level 4 organizations have effective decision making and IT provides services that reinforce the concept of IT as a value center. Level 4 organizations leverage their IT assets enterprise-wide, and they focus applications on enhancing business processes for sustainable competitive advantage. SLAs are also enterprise-wide, and benchmarking is a routine practice. Strategic business and IT planning processes are managed across the enterprise. Formal IT steering committees meet regularly and are effective at the strategic, tactical, and operational levels. The business views IT as a valued service provider and as an enabler (or driver) of change. In fact, the business shares risks and rewards with IT by providing effective sponsorship and championing all IT projects. Overall, change management is highly effective. Career crossovers between business and IT occur across functions, with business and technical skills recognized as very important to the business and IT.

Level 5: Optimized processes

Organizations at Level 5 have optimized strategic IT-business alignment through rigorous governance processes that integrate strategic business planning and IT planning. Alignment goes beyond the enterprise by leveraging IT with the company’s business partners, customers, and clients, as well. IT has extended its reach to encompass the value chains of external customers and suppliers. Relationships between the business and IT are informal, and knowledge is shared with external partners. Business metrics, IT metrics, and SLAs also extend to external partners, and benchmarking is routinely performed with these partners. Strategic business and IT planning are

integrated across the organization, as well as outside the organization. Organizations have often looked for a silver bullet to improve the alignment of IT-business. Some thought the right technology (e.g., infrastructure, applications) was the answer. While important, it is not enough. Likewise, improved communications between IT and the business help, but are not enough. Similarly, establishing a partnership is not enough, nor is balanced metrics that combine appropriate business and technical measurements. More recently, governance has been touted as the answer. This is the process to identify and prioritize projects, resources, and risks. Today, we also recognize the importance of having the appropriate skills to execute and support the environment. Research has found that all six of these components must be addressed to improve alignment.

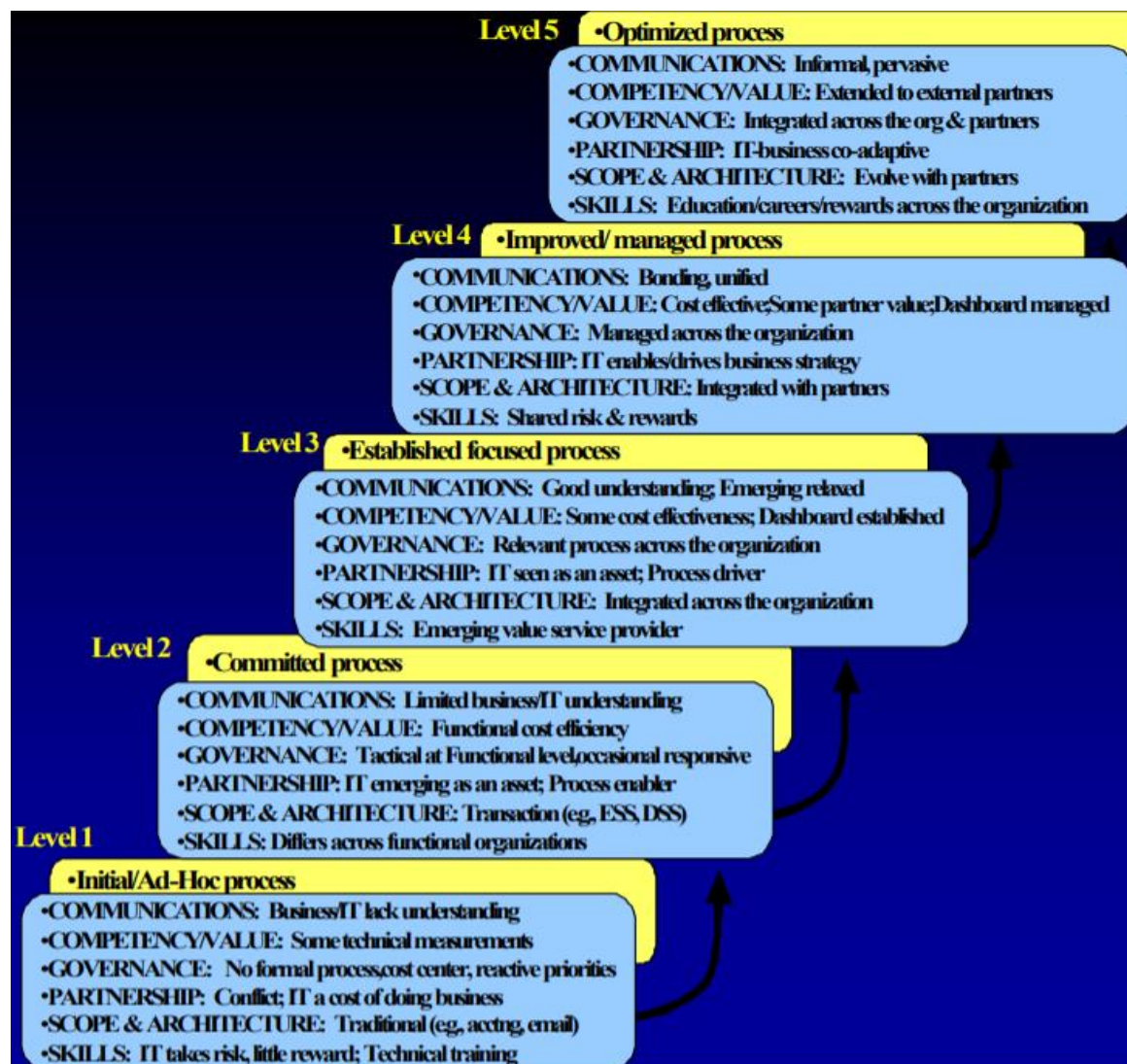


Figure 3: The Strategic Alignment Maturity Summary (Luftman, 2000).

2.8. Benefits of IT-business Alignment

IT-business alignment is ideal enabler to support dynamic business strategies (Naidoo, 2011). IT-business alignment improves effectiveness and efficiency of organizations which helps strategic goal attainment. It also helps to manage business objectives prioritization and effective communication between business and IT. Moreover, it helps to standardize processes, improve business and IT knowledge of each other's environments and also improve appropriate application of technology (Venkatraman, 1989; Henderson & Venkatraman, 1993; Weill & Broadbent, 1998; Smaczny, 2001; Luftman, 2012). While several researches asserted the benefits of IT-business alignment, the number of organizations that successfully align their IT strategy with business strategy is shown to be considerably low (Naidoo, 2011). This indicates the demand of the awareness of IT-business alignment by organizations' top management which ultimately helps attaining better business performance.

2.9. Empirical Review

Research conducted by Danjou (2016) on 48 local city government agencies in the Southwestern part of the United States to evaluate their IT-business alignment. Moreover, the study attempted to assess the impact of IT-business alignment on the cities' employment size. The study employed an online quantitative survey for data collection based on Luftman's SAM model. The result of the survey was analyzed using descriptive statistics and an Analysis of variance.

Based on SAM model, the current snapshot maturity level of the 48 local city government agencies was 2.49 out of a maximum 5.0 level. Moreover, the study illustrated that IT-business alignment maturity level of the cities and their corresponding employment size are not related.

This study lacks comprehensiveness as it didn't incorporate the Governance construct that was identified by Luftman (2000) along with the other SAM model's constructs in the survey questionnaire. Moreover, the research didn't attempt to identify additional constructs that determine the maturity of IT-business alignment in the context of the 48 local city government agencies incorporated in the study. In line with this, the research recommended incorporating additional contextual constructs.

Naidoo (2011) conducted a case study on IT-business strategic alignment maturity at Volkswagen based in South Africa. The main objective of the research was to measure the IT-business strategic alignment maturity level during the 2008-2010 strategic period and its influence on the case organization in the process of achieving these objectives.

The researcher used mixed methodology (both quantitative and qualitative) in which structured interview and a survey questionnaire were employed. The result shows that the overall average maturity level of the case organization was measured 2.94, which correspond to a level 2 alignment maturity which defines organizations as having commitment to start being more strategically aligned. The research didn't reveal the sampling technique and procedure employed to involve only 15 employees for participating on the interview and survey questionnaire even though the total population of the case firm was around 10,000. Due to this, the validity and reliability of study might be affected since the researcher had to rely on the perceptions the chosen 15 staffs to generalize the findings of the study. Moreover, the study didn't attempt to incorporate additional constructs that might have an impact on IT-business alignment in the context of the case organization.

Chen (2009) researched about IT-business alignment maturity of companies in China. The primary objective of the study was to cross-validate the strategic alignment maturity (SAM) model which was developed by Luftman (2000), that consists of six maturity dimensions namely: communication, value analysis, IT-governance, partnership, scope and architecture, and skills.

The research employed a sample of 130 business and IT executives from 22 companies covering a wide range of industries located in China. Among the participated firms, half of the companies were Chinese domestic companies, while the other half were multinationals operating in China. The second objective of the study was to assess the current state of IT- business alignment of companies in China using the survey questionnaire developed by Luftman (2000). In order to cross-validate the alignment maturity instrument, Confirmatory Factor Analysis (CAF) were employed. Moreover, correlation and linear regression were used to assess the concurrent validity of model, the relationships among the calculated overall maturity and self-reported maturity. According to the research's finding, the average overall IT-business alignment maturity score was 2.87 (Std. dev. = 0.71) suggesting that, on average, the alignment of companies in China falls somewhere between the level 2 (Committed Process) and level 3 (Established Focused Process).

The companies scored relatively high in the communication and Scope and architecture and relatively low in the government and skills constructs. When comparing the factor scores between the Chinese domestic companies and multinationals, the study found that multinationals on average scored higher in each factor than Chinese domestic companies. However, the study didn't attempt to identify any additional constructs that are vital in measuring IT-business alignment in the context of Chinese companies.

Sledgianwoski and Luftman (2005) have studied IT-business alignment maturity by conducting a case study in an international specialty chemicals developer and manufacturer company. The objective of the study was to measure the IT-business alignment maturity of the firm and also to assess impact of misalignment. The study employed quantitative method by using standard questionnaires as primary sources of data collection Accordingly, the strategic alignment maturity model was adopted to measure the alignment maturity of the firm.

According to the survey, the IT-business alignment maturity of the firm is determined as level 3 based on SAM maturity framework. However, the study didn't reveal the sample size, how the survey participants are chosen and also the job status of the participants. Moreover, the study didn't show how the business strategy is aligned with the IT strategy at strategic level based on the firm's strategy documents. Even though, one of the objective of the study was to assess the impact of misalignment, the discussion mainly focused on the alignment maturity level of the firm. The researchers did not point out further researchable areas as a recommendation.

Currently, there are scarce research attempts made on IT-business alignment in the context of Ethiopia. Accordingly, three research studies were found that are explained as below:

King (2018) has conducted his MSc. thesis on bridging the gap between IT and business strategy mainly focusing on exploring the alignment gap. The research employed case-study at anonymous private financial bank in Ethiopia. The objective of the study was to investigate and bridge the gap between business and IT strategy. In line with this, the researcher employed qualitative methodology using interviews in the anonymous case organization. Accordingly, the study suggested an architecture to bridge the gap between business and IT. Yet, this study falls short of addressing the strategic alignment gap bridging since it focusses only the relationship between IT and business in the context of gathering a requirement and developing software systems to the

business. Moreover, the context of the case organization is not clearly stated in order to make it anonymous which hinders to draw lessons learnt for other organizations with similar situation. The researcher recommended further research on IT-business alignment by considering organization working in industries other than financial sector.

Abdulselem (2017) has conducted his MSc. thesis on IT-business alignment in commercial banks of Ethiopia. The main objective of the study was to assess the IT-business alignment maturity level of Dashen, Awash and Commercial banks of Ethiopia. As a research methodology, the researcher employed a mixed approach by applying both qualitative and quantitative methods. The study adopted Luftman's (2000) SAM model as a framework to prepare the survey questionnaire and interview. The researcher used purposive sampling to purposively choose experts of the firms.

The study revealed that the overall average maturity of the banks is at level 2 which shows committed process based on SAM model. However, the study didn't attempt to incorporate additional constructs that determine IT-business alignment in the context of Ethiopia in general and the banks specifically. This is also supported by the researcher's recommendation which asserts using other models and additional dimensions of IT-business alignment in order to have a better measurement of maturity.

Girma (2013) has conducted his MBA thesis on IT and business strategy alignment and its impact on the performance of commercial banks in Ethiopia. The main objective of the study was to identify the impact of IT and business strategy alignment on the performance of the selected banks. The study adopted a model developed by Hout (2012) which describes the five core factors that influence IT and business strategic alignment. These factors are the intention and support of top management, IT performance, IT projects and planning, shared domain knowledge and working relationship of business and IT.

The study adopted a mix of structured and unstructured questionnaire to collect data from nine banks. The research was carried out by collecting data from HR manager, business development manager and IT manager of the selected banks. The study revealed that the nine banks are in different levels of alignment and IT investment level. In relation to performance, the study indicated that those banks with better IT-business alignment maturity level are in a better business performance by comparing the nine banks. However, the model adopted neither address all of the

constructs that are identified by Luftman (2000) nor attempted to incorporate new constructs in the context of the nine banks. In this regard, the researcher also recommended further study on looking for additional constructs that have an impact on IT-business alignment and also studying in other business sectors to clearly identify the factors that affect IT-business alignment.

The above mentioned local research attempts indicated the gap IT-business alignment related researches that addresses airline industry and also incorporating contextualized constructs taking the firm and the industry in which the firm operates in to account. As a summary, the related works that are discussed above are presented in table 2.

Table 2: Summary of Related Works

Author, Title & Year	Objective/ Purpose	Approaches/ Methodologies	Key Findings	Recommendation & Future Work	Remark
<p>Danjou, L.</p> <p>Assessing Information Technology and Business Alignment in Local City Government</p> <p>(2016)</p>	<p>To evaluate IT-business alignment maturity of 48 local city government agencies in the Southwestern part of the United States and also to assess the impact of IT-business alignment on the cities' employment size.</p>	<p>Quantitative methodology employed using SAM model standard questionnaire.</p>	<p>Based on SAM model, the current snapshot maturity level of the 48 local city government agencies was 2.49 out of a maximum 5.0 level. Moreover, the study illustrated that there is no significant relationship between the IT-business alignment maturity level of the cities and their corresponding employment size.</p>	<p>recommended incorporating additional constructs in the context of the specific study and analysis of the impact of IT-business alignment on other dimensions such as customer relationship, supplier management, data protection, and outsourcing.</p>	<p>Lacks comprehensiveness as it didn't incorporate the Governance construct that was identified by Luftman (2000) along with the other SAM model's constructs in the survey questionnaire. The other limitation of this study was meeting the potential participants of the study through e-mail to fill-out the survey online without any face-to-face interaction which affected the response rate. Moreover, the research didn't attempt to identify additional constructs that determine the maturity of IT-business alignment in the context of the 48 local city government agencies incorporated in the study.</p>
<p>Naidoo, L.</p> <p>The Strategic alignment maturity of business and Information technology at Volkswagen South Africa</p> <p>(2011)</p>	<p>To measure the IT-business strategic alignment maturity level during the 2008-2010 strategic period and its influence on the case organization in the process of achieving these objectives.</p>	<p>Case study in Volkswagen company located in South Africa. Mixed methodology (both quantitative and qualitative) employed in which structure interview and survey questionnaire used.</p>	<p>The overall average maturity level of the case organization was measured as 2.94, which corresponds to a level 2 alignment maturity.</p>		<p>The research didn't reveal the sampling technique and procedure employed to involve only 15 employees for participating on the interview and survey questionnaire even though the total population of the case firm was around 10,000. Due to this, the validity and reliability of study might be affected</p>

Author, Title & Year	Objective/ Purpose	Approaches/ Methodologies	Key Findings	Recommendation & Future Work	Remark
					since the researcher had to rely on the perceptions the chosen 15 staffs to generalize the findings of the study. Moreover, the study didn't attempt to incorporate additional constructs that might have an impact on IT-business alignment in the context of the case organization.
Chen, L. Business-IT alignment maturity of companies in China (2009)	To assess the current state of business-IT alignment in Chinese companies.	Questionnaire used as primary source of data.	The average overall IT-business alignment score of the Chinese companies was 2.87 (Std. dev. = 0.71) which indicates, the alignment falls between the level 2 (Committed Process) and level 3 (Established Focused Process).		The study didn't attempt to identify any additional constructs that are vital in measuring IT-business alignment in the context of Chinese companies. Moreover, the study didn't show how the business strategy is aligned with the IT strategy at strategic level based on the firm's strategy documents.

Author, Title & Year	Objective/ Purpose	Approaches/ Methodologies	Key Findings	Recommendation & Future Work	Remark
<p>Sledgianowski, D. & Luftman, J.</p> <p>IT-Business Strategic Alignment Maturity: A Case Study</p> <p>(2007)</p>	<p>To assess the maturity of alignment and the impact of misalignment on the case firm.</p>	<p>Quantitative method using Case-study methodology used. Standard Questionnaire generated by Luftman (2000) was used to capture data.</p>	<p>The IT-business alignment of the firm was determined as level 3.</p>	<p>The research did not identify any future work.</p>	<p>Even though, one of the objectives of the study was to assess the impact of misalignment, the discussion mainly focused on the alignment maturity level of the firm. The study didn't attempt to contextualize the strategic alignment maturity model based on the contexts of the firm.</p>
<p>King, S.</p> <p>Bridging the gap between IT Strategy and Business Strategy:</p> <p>Exploring Strategic Alignment Gap</p> <p>(2018)</p>	<p>to investigate and bridge the gap between business and IT strategy.</p>	<p>A case study with qualitative methodology. Interview used as the main source of data collection used.</p>	<p>An architecture suggested to bridge the gap between business and IT.</p>	<p>recommended further research on IT-business alignment by considering organization working in industries other than financial sector.</p>	<p>Yet, this study falls short of addressing the strategic alignment gap bridging since it focusses only the relationship between IT and business in the context of gathering a requirement and developing software systems to the business. Moreover, the context of the case organization is not clearly stated in order to make it anonymous which hinders to draw lessons learnt for other organizations with similar situation.</p>

Author, Title & Year	Objective/ Purpose	Approaches/ Methodologies	Key Findings	Recommendation & Future Work	Remark
Abdulselam, R. Assessing Business and Information Technology Alignment maturity: The case of Commercial Banks in Ethiopia (2017)	To assess the maturity level of IT-business alignment (BITA) of commercial banks in Ethiopia.	Mixed methodology (both quantitative and qualitative) were employed.	Revealed the IT-business alignment maturity level of the firms based on Luftman's (2000) SAM model.	Recommended to use other model or use additional constructs that are important in measuring IT-business alignment maturity.	The study didn't attempt to identify any additional constructs that are vital in measuring IT-business alignment in the context of Ethiopian Banking sector.
Girma, A. Information Technology and Business Strategy Alignment, and its impact on the performance of Commercial Banks in Ethiopia (2013)	To identify the impact of IT and business strategy alignment on the performance of the selected banks.	Case Study in the banking sector with Interview and questionnaire as the main source of data collection.	Revealed that banks with a better IT-business alignment maturity show better business performance which indicates the positive impact of IT-business alignment on business performance.	Recommended to work on identifying additional factors that affect IT-business alignment in the context of specific industry/ sector.	The constructs are not comprehensive enough to measure IT-business alignment maturity.

2.10. Conceptual Framework (Research Model)

The research model is defined by conducting extensive literature review and also an interview to first assess the relevance of the model in the local context and add if something is (are) missing. This is relevant due to the fact that using the existing model without enhancing it might not fit with the context of Ethiopian airlines. Based on this, IT and business directors were chosen who are experts in their respective area. The researcher selected the interviewees purposefully who are believed to be appropriate key informants from the perspective of having a say in IT-business alignment establishment and being conversant with the concept. Based on the researcher's subjective judgment, the sample size for interview initially determined to be six. Later in the process, the data was saturated after five selected key informants are interviewed. According to Creswell (2007), saturation is the concept of analyzing the collected data and come in to a point at which the researcher can no longer find new information that adds value with respect to the intended goal.

The interviewees from IT were three in number (CIO, Head Operations services and Director Digital) and the rest two were from the business (Director Internal & IT Audit and Director Corporate Strategy). According to Luftman's SAM model, there are constructs that determine the maturity of IT-business alignment. These are communication, competency/value measurement, governance, partnership, scope and architecture, & skills. In line with this, one by one interview is conducted with the above mentioned experts with the purpose of validating these constructs and also gathering additional constructs that can determine the maturity of IT-business alignment. In line with this, an open coding is used to elaborate the output of the interview.

A brief explanation has been given to each of the interviewees regarding the purpose of the study and the identified constructs. As shown in Appendix C, the interviewees were requested regarding the validity of the constructs that are identified through literatures. Moreover, they were also requested if there are additional constructs that they believe key elements for achieving alignment. All the interviewees replied that all of the constructs that are identified through literature are vital to determine IT-business alignment. In relation to additional constructs, two interviewees each from IT and business replied that the already identified constructs are enough to measure the alignment maturity. However, the other three interviewees suggested to incorporate social

alignment and IT investment constructs to better analyze and achieve IT-business alignment. According to the interviewees, the Social alignment represents the understanding and the relationship among IT and business executives, managers and employees. IT investment represents the amount of resource that Ethiopian airlines spends on the IT infrastructure and systems in order to enable and also drive the business strategy.

Based on the interview output, the next step is analyzing the proposed constructs whether they can be embedded in the existing constructs or not. In line with this, it is found that social alignment can be represented in communications construct since the interview questions incorporate the understanding of IT by the business and also the business by IT. Moreover, the partnership construct incorporates the role of IT in strategic planning, the risks and rewards sharing, the relationship and trust between IT and business which basically addresses social alignment.

In line with IT investment, the existing constructs does not clearly address IT investment but there are two questions under the construct of IT-Governance which attempts to address IT budgeting and investment decisions. In view of this, a literature review was conducted in order to assess the relationship between IT investment and IT-business alignment. Accordingly, some researches asserted that IT-investment determines IT-business alignment and also related with organization's business performance (Gerow, 2014; Xue et al. 2012). According to Gerow (2014), five main dimensions were identified that have an influence on IT-business alignment; IT investment is one of the constructs of alignment along with environmental turbulence, type of adopted strategy, governance structure and social relationship.

Based on Gerow (2014), IT investment can be used by firms to create, maintain and improve IT capabilities to establish alignment. The alignment capability helps to utilize IT resources for business value achievement. Consequently, four research questions were developed and two questions that are under IT-governance are regrouped to represent the IT-investment construct. The developed research questions address the sufficiency of the capital budget for IT investment, how the resources are being invested, whether the investments support and enable the business and whether the investments are helping to create, maintain and improve IT capabilities necessary to establish better alignment.

As depicted in figure 4, the model illustrates the constructs adopted from Luftman's (2016) SAM model and also an additional construct derived from an interview as discussed above.

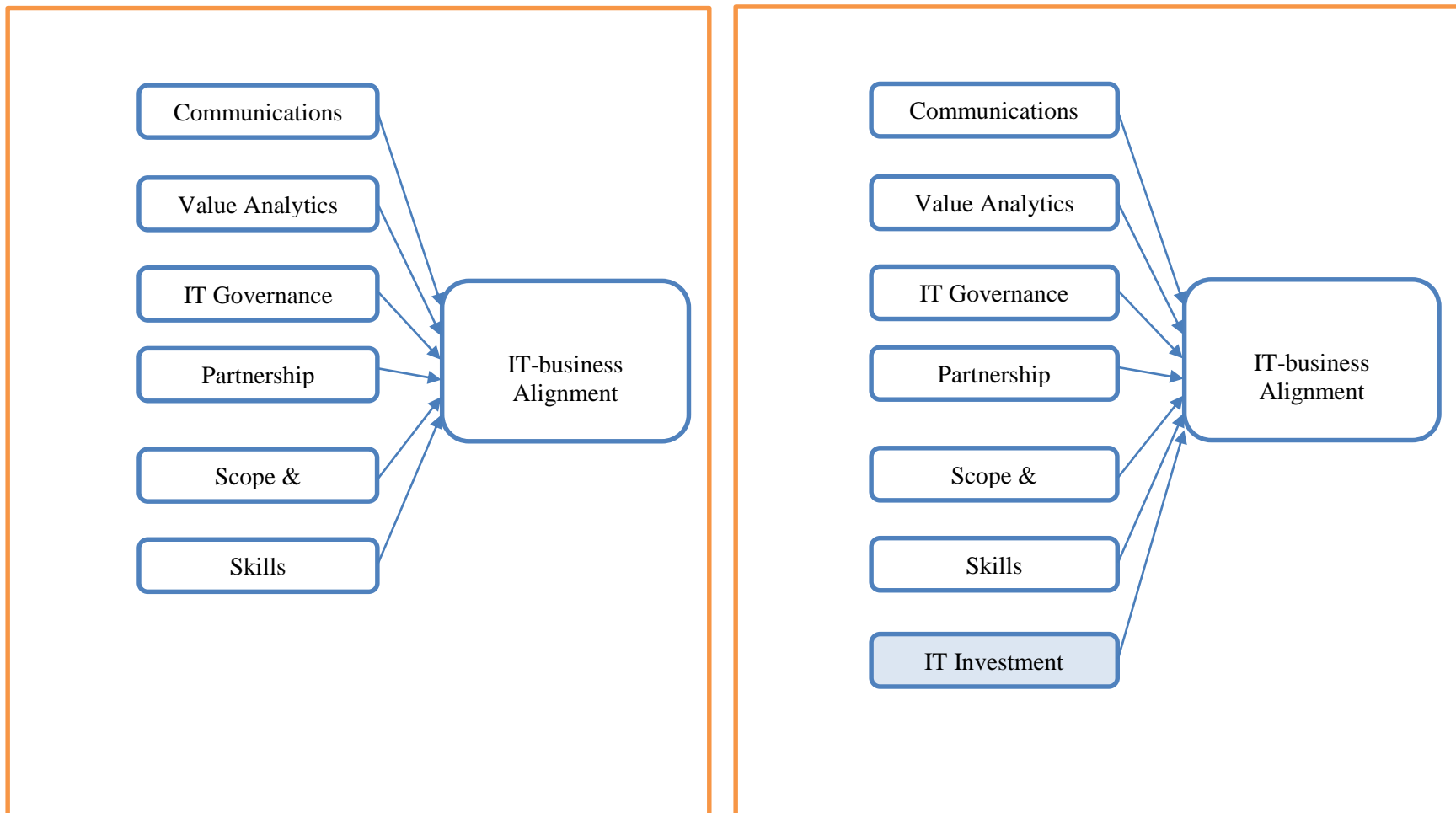


Figure 4: Research Model proposed by Luftman, 2000(Left); Research Model enhanced in this study by incorporating IT Investment (Right)

The constructs that are adopted from SAM model are: communication, competency/value measurement, governance, partnership, scope and architecture, & skills. In addition to this, IT investment is the construct that is identified through interview conducted with IT and business directors of the case organization. Accordingly, Ethiopian airline's IT-business alignment maturity was evaluated based on the research model. The constructs of this study are further along with the sources of the questionnaire items that are designed to get data regarding the variables are discussed below:

Communications: describes the quality and intensity of the exchange of knowledge, information and ideas between IT and business units. In line with this, communication enables organizations to clearly understand their respective vision, mission, strategies, business plans, priorities, business and IT environments and risks. Moreover, it helps to facilitate achieving business and IT strategies (Luftman, 2016). In today's dynamic IT and business environments that continuously threaten organizations, knowledge sharing through proper communication is vital. Several studies indicated that effective communications between IT and the business facilitated better mutual understanding and coordinated activities which leads to IT-business alignment (Luftman, 2016 and Reich & Benbasat, 2000). In other terms, proper communication between IT and business facilitates trusting relationships, faster responses and better accountability which leads to collaborative leveraging of resources that can create competitive advantage (Luftman, 2016). In line with this, the questionnaire items (1 to 6) under communication construct were drawn from Luftman (2016) to measure the role of communication on IT-business alignment maturity.

Value Analytics: describes to the potential use of metrics to determine the contributions of IT to the business in such a way that both the business and IT comprehend and accept. In other terms, IT should demonstrate their value to the business in terms that the business understands. This requires, an effective collaboration and create a shared dashboard clearly exhibits the value of IT in terms of contribution to the business. Moreover, it demands gathering and applying relevant technical expertise from the IT function that can provide demonstrable measures in such a way that the business can understand. In the same manner, the business needs to learn to apply and expect competencies from the measurement within IT (Luftman, 2016). Based on this, the questionnaire items (7-14) under Value analytics construct were drawn from Luftman (2016) to measure the role of value analytics on IT-business alignment maturity.

IT Governance: describes to the allocation of authority for IT decisions and the processes IT and business manager's use at strategic, tactical, and operational levels for setting IT priorities, allocating resources, and controlling activities. It also deals with how well the organization ties its business strategy to current IT priorities, technical planning, managing and also risk. It governs who makes the decisions (power), why they make the decisions (value), and how they make them (the decision process such as portfolio management). Scholars argue that governance related activities contribute to IT-business alignment since they help to recognize the value of IT and also define a business vision and strategies and the role of IT in achieving them (Luftman, 2000; Smaczny, 2001; Luftman, 2016). Accordingly, the questionnaire items (15-19) under IT governance construct were drawn from Luftman (2016) to measure the role of governance on IT-business alignment maturity.

Partnership: denotes the level of relationship between business and IT units. This embraces defining IT's role in business strategies, the degree of trust between IT and the business, and how each perceives the other's contribution. It is essential for the IT division to directly collaborate with the business functions which can create realistic expectations, build mutual trust and enhance effective relationships. According to Luftman (2000), it is easier to achieve alignment with cross-functional teams that sustain working relationships. It helps to understand and commit to shared strategies as they lead to risk and reward sharing (Luftman 2000). Accordingly, the questionnaire items (20-25) under partnership between IT and Business construct were adopted from Luftman (2016) to measure the impact of partnership on IT-business alignment maturity.

Scope and Architecture: refers to the availing a flexible infrastructure, its evaluation, and the adoption of emerging technologies and delivery of customized systems to business units and external customers or partners. This construct refers into the broader impact of IT services through appropriate and innovative scoping of what the IT function does to provide perceptible business value. Scope and architecture is the only set of technical construct incorporated in the alignment processes. Scholars argue that dynamic scoping is desirable as companies change their business scope their infrastructure needs to be re-scoped (Luftman, 2000; Luftman, 2016; Smaczny, 2001). This helps to create shared activities that create a flexible IT infrastructure, continuously evaluate and apply emerging technologies, and improve IT related activities that drive direct business process enhancement or deliver customized systems/services. Accordingly, the questionnaire

items (26-30) under scope and architecture construct were adopted from Luftman (2016) to measure the role of scope and architecture on IT-business alignment maturity.

Skill: states the HR practices, such as hiring, training, performance, retaining, innovation encouragement, career opportunities, and individual skill development within IT. Moreover, it measures the organization's readiness for change, learning capability, and ability to leverage new innovative ideas. According to Bohlander and Snell (2007), it is crucial to invest on IT and business employees' (sourced internally or externally) skills and competencies in order to achieve the desired levels of communications and value analytics which ultimately promotes alignment. Researches have shown the positive impact of higher quality and appropriately balanced HR in promoting alignment (Bohlander and Snell, 2007; Pynes, 2008). Thus, the questionnaire items (31-37) under HR Skills construct were adopted from Luftman (2016) to measure the role of HR Skills on IT-business alignment maturity.

IT investment: refers to the amount of money that is spend by organizations for the purpose of IT infrastructure (Gerow, 2014). In this construct, the sufficiency of the capital budget allocated for IT investment is measured. It evaluates the primary objective of the IT investment decisions which indicated the IT's ability in the organization from the perspective of adding value to the organization. It also evaluates how the IT resources are being invested for the projects that help to achieve strategic goal. Moreover, it evaluates how the IT investment supports and enables the business in order to enhance firm performance. In addition to this, it assesses whether the IT investment is helping to create, maintain and improve IT capabilities necessary to establish alignment (Gerow, 2014). In line with this, the questionnaire items (38 to 43) were newly developed based on the reviewed literatures to measure the role of IT-investment on IT-business alignment maturity.

CHAPTER THREE

Research Methodology

This study has attempted to measure the level of IT-business alignment maturity in Ethiopian airlines based on IT-business alignment maturity model so as to determine the maturity level and define roadmap to progress to the next maturity level based on identified improvement areas. Moreover, this study investigates how IT strategy contributes towards successful implementation of business strategies and help achieving business strategy.

This chapter presents the methodology that is used to achieve the objective of the study. First, the general research approach is described. Next, the research model along with the constructs is discussed. Then, population of the study, sampling techniques, sample size, data collection instrument, data collection procedure, and pilot study are discussed. Finally, data analysis and presentation method is presented along with quality of the research.

3.1. General Research Strategy

Research Approach

The general approach of this research is a case study in which a combination of quantitative and qualitative methods is used to collect and analyze data. A case study research can employ both quantitative and qualitative sources of data collection in order to have a holistic analysis of a specific aspect of the case to best answer research questions (Yin, 2003; Luck, et al., 2006; Creswell, 2007). Moreover, a case study research encompasses the study of an issue explored through one or more cases with in chosen boundaries or systems (Creswell, 2007). A case study can employ single or multiple cases for data collection and detailed study. In a multiple case study two or more cases are considered to show different perspectives on the chosen issue. The multiple case study uses the logic of replication, in which the researcher replicates the procedures for each of the cases (Creswell, 2007 and Yin, 2003). However, a single case study is suitable when the case is representative, critical, extreme or unique. In a single case study, the researcher focuses on an issue or concern, and then selects one bounded case to illustrate this issue (Creswell, 2007). In

this study, a single case company is chosen since there are no other local airlines that are operating in airline industry with the same operation scale with Ethiopian Airlines.

In this research, Ethiopian Airlines is considered as a case company to study IT-business alignment, which basically concentrates on measuring the alignment maturity and also investigating how IT strategy contributes towards successful implementation of business strategies and help achieving business strategy.

Ethiopian Airlines is selected for the case study since the company has a huge IT investment every year in order to stay in business and further win the stiff competition of an airline industry. In line with this, improving IT-business alignment maturity helps to leverage IT with the aim of business value achievement. The other reason is, as Ethiopian Airlines is a global organization with a flavor of both international and local organizational cultures with an intensive use of IT other Ethiopian firms can learn a lot from the output of this study. Moreover, the researcher works for about 10+ years in the organization with Information system development and management experience which can positively contribute to the success of the research. The main reason that the study focused on IT-business alignment is return on information systems' investments and subsequent business results can be gained if and only if they are aligned with the business strategy.

In this study, both quantitative and qualitative data collection and analysis methods are employed. The quantitative approach provides leverage to reach more people with optimized time than qualitative approach. Hence, it provides the potential to mine large amounts of information from large populations with adequate level of accuracy.

For the purpose of quantitative analysis, this study employed survey which is conducted through a questionnaire. The questionnaire items are fully adopted from Luftman's SAM model (Luftman, 2000). Subsequently, the questionnaire is enhanced by conducting interview and analyzing the feedbacks of IT and business experts as elaborated in subsequent sections of this paper.

Qualitative approach is also conducted through document analysis to explore the alignment of business and IT strategy documents. The qualitative document analysis is used as a secondary source of data to gain more information and support the findings reached by questionnaire survey. Moreover, it helps for the purpose of triangulation.

Accordingly, based on the selected organization as case unit of analysis, the IT-business alignment maturity measured. Based on the finding of the quantitative and qualitative analysis, a roadmap is defined in order to progress to the next higher IT-business alignment maturity level.

3.2. Study Design

3.2.1. Research Respondents

Ethiopian Airlines has around 16,000 employees including staffs working in different countries (international locations). This study has taken employees at head quarter by focusing on office based workers as target population not only for a reason of manageability but also for the following reasons. Firstly, all city, regional and outstation offices are being managed and controlled centrally from Head Quarter. Secondly, flying crews and operational staff are represented by their support back office workers at Head Quarter; Thirdly, majority of employees including executives, who have key roles for establishment of IT-business alignment within the organization, are positioned at Head Quarter. The population of the study is considered to be IT (both management and non-management) and business (only management) employees based in head quarter. Due to the nature of their work, the IT employees have the expertise and exposure about IT-business alignment generally and the constructs of this study specifically which makes them the right informants of the research. However, non-management business employees lack the required expertise, exposure and experience to be an informant of this study. Based on this, management members of the business units are considered since their expertise permits them to clearly understand and give feedback for the IT-business alignment constructs. Accordingly, 235 employees from IT (both management and non-management) and 507 employees from business (only management) are considered as valid target population of the empirical study. Hence, the target population of the study embraces 742 IT non-management, IT management and business management employees (N=742).

3.2.2. Sampling Techniques and Sample Size

In this study, proportional stratified sampling technique is used for the quantitative analysis in order to get proportional representative sample from IT and business employees. The main purpose

of using stratified sampling is to reduce bias and ultimately improve the precision level of the output of the study. The target population is stratified according to their working division as IT (both management and non-management) and business (management only).

Therefore, proportional stratified sampling technique was applied to get representative sample from the target population.

Among the target population of 742, it is identified that 31% (235) represents IT employees (both IT and non-IT) group while the remaining 69% (507) is business management group. Subsequently, taking the total target population size (N) of 742, the sample size for the quantitative survey (questionnaire) is determined to be 254 (n=254) applying the sampling formula shown below (Chohran, 1977) with confidence level of 95% and 5% confidence interval.

$$n_0 = \frac{(Z_{\alpha/2})^2 pq}{e^2}$$

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

Where, N = Target Population

n_0 = Sample size

n = Calculated/Actual sample size

e = the desired level of precision, (taken confidence level = 90% where by $\alpha = 0.1$)

P = is estimated proportion of an attribute in the population (taken as 0.5 and q = 1-P = 0.5; for conservative estimate)

Z = normal curve that cuts an area α (the value read from statistical table)

Once the sample size is determined to be 254, the proportional sample size for IT and business staffs was computed using the aforementioned percentage values (31% and 69%). Thus, at a

minimum a sample of 79 and 175 were determined to be taken as number of staff required to participate in responding the survey questionnaire from IT (both management and non-management) and business (only management) respectively as can be seen in table 3.

Table 3: IT and business employees' classification

IT and business employees' classification and Sample Size determination			
Employee's Working area	Number of Employees	Percentage of the strata from the total target population size	Proportional sample size of the strata
IT (both management and non-management)	235	31%	79
Business (management)	507	69%	175
Grand Total	742	100%	254

Source: Own survey, 2018

According to Luftman (2000), obtaining appropriate representatives from the major business functional units is paramount to the success of the IT business alignment. In line with this, further stratified sampling was applied in order to determine the appropriate number of sample size from each business and functional units. Accordingly, stratified proportional sampling is applied by considering the business units as stratum which determines sample size per division as compiled in table 4.

Table 4: Employees' further classification based on Division stratum

Further IT and business employees' classification and Sample Size determination			
Employee's Division	Number of Employees	Percentage of the strata from the total target population size	Proportional sample size of the strata
Cargo Management	46	6%	15
Catering Management	14	2%	5
Commercial Management	39	5%	13
Customer Service Management	35	5%	13
Ethiopian Aviation Academy (EAA) Management	18	3%	7
Finance Management	27	4%	10
Flight Operations Management	31	4%	10
Ground Services Management	31	4%	10

Further IT and business employees' classification and Sample Size determination			
Human Resource Management (HRM) Management	41	6%	15
Internal Audit & Corporate Quality Management System (QMS) and Compliance Management	6	1%	3
IT (both Management and Non-Management)	235	31%	79
Maintenance & Repair Overhaul (MRO) Management	201	26%	67
Strategic Planning & Alliance Management	18	3%	7
Grand Total	742	100%	254

The document analysis is conducted using the Ethiopian Airlines corporate strategy and the IT strategy, which were created in accordance with vision 2025 of the organization. Moreover, service level agreements between IT and business units and various policies and procedures were also analyzed. Accordingly, the alignment of the IT and business strategy is analyzed from the perspective of the revised documents.

3.2.3. Data Collection Instrument

The instruments used for collecting the required data were questionnaire and document analysis. The data collection instruments are further described below:

3.2.3.1. Questionnaire

The data collection instrument was mainly adopted from a Luftman (2016) that are relevant to meet objective of this study. Moreover, questionnaire items were developed by the researcher for the newly incorporated construct namely IT-investment. The questionnaire development involved a three-step process as described below:

First, the questionnaire items were selected from literatures that are relevant to measure the identified constructs depicted in the research model. Minor customizations were made to some of the questions in order to reflect the objective of the study. Moreover, some questions were newly developed based on the reviewed literatures. Secondly, the questionnaire was reviewed by focus

group of three directors and senior IT quality assurance personnel who are working in the IT divisions of Ethiopian Airlines. The discussion with focus group helped to rephrase some questionnaire items to remove ambiguity and improve the response rate. Thirdly, the questionnaire was pilot tested by 14 management employees, half of them were from business and the rest were from IT. The objective of the pilot study was to test whether the survey instrument provided consistent and accurate information. Accordingly, modifications were made on the questionnaire items based on the pilot study respondents' feedbacks which ultimately helps to reduce bias and maximize response rate. Most of the feedbacks were related to the layout of the questionnaire and the language used such as simplifying specific jargons and phrasing of various items. Further discussions with the pilot study participants helped to simplify the construction of certain questionnaire items.

3.2.3.2. Document Analysis

Document analysis was used to reinforce the analysis by referring different documents of Ethiopian Airlines. Some of the documents that were analyzed include: Ethiopian Airlines corporate strategy, IT strategy, and service level agreements between IT and business units and various policies and procedures.

3.2.4. Data Collection Procedure

The questionnaires have been designed on an online survey tool called SurveyMonkey and the link was disseminated to the target respondents through company email. The participants were given two weeks to complete the survey and a reminder and a follow-up email sent four times within the given time period. However, it was only two questionnaires that were filled within the time period of two weeks. Next to this, the researcher conducted trend analysis of questionnaire response rate of Ethiopian Airline's Employees. In Ethiopian Airlines, market feedback analysis (MFA) is one of the tools used to conduct a survey to improve internal services and achieve competitive excellence (ACE). In due course, business units/sections disseminate online survey to other internal business units/sections to measure the customer satisfaction and identify improvement opportunities. According to the discussion held with few business managers, the response rate of the online MFA is only 20%. This might be associated with the tight work load of

the employees, time constraints and the attitude of giving genuine feedbacks in online surveys. They were also requested about the survey success of the online versus the hard copy, and they replied that the hard copy survey response rate is better than online surveys. Hence, two mechanisms were devised to maximize the response rate of the survey. Firstly, the number of the questionnaire distributed to the respondents was incremented by 6 to the number of determined sample size 254 which gives a total of 260. Secondly, the survey was implemented using a paper-based questionnaire to obtain a better response rate. This kind of data collection approach was preferred in order to provide briefing about the objective of the survey by organizing a group of employees from the same section/ department; which ultimately increases the response rates. Moreover, it helped to conduct appropriate follow-up reminders and support the respondents in any queries they had regarding the questionnaire items. The initial communication to the respondents include clear instructions of the questionnaire, promises of anonymity, and explaining how the output of the research can contribute to the improvement of IT-business alignment and the business value of the organization.

Accordingly, the questionnaire was hand delivered to 260 selected respondents physically by the researcher. Subsequently, continuous follow-ups conducted through phone, company e-mail, short message service such as using Lync and Skype for business. Moreover, the researcher also visits the respondents physically to encourage them to finalize the questionnaires timely with their genuine feedbacks. Additionally, employees were nominated from each and every of the departments/ sections, so that they can encourage, assist and facilitate the data collection process in their respective working area.

The filled questionnaires were collected after waiting for the target date given to the respondents. Of the total number of distributed questionnaires, 36 of the respondents couldn't return the questionnaire due to different reasons and 224 were collected. This indicates the achievement of 86.15% response rate. Data cleaning was conducted for possible omissions, missing items and errors. Accordingly, of the total 224 responses collected, 6 responses considered incomplete, leaving 218 usable responses that are ready for analysis of the study. This indicates of the total 260 distributed questionnaires, 83.84% found to be complete and valid to be used for the analysis of the study.

The data collected using the questionnaire were then logged and tracked on excel sheet. Next, the questionnaire items were coded as can be seen in appendix D and then the data imported to Statistical Package for Social Science (SPSS) version 24 software tool. Eventually, SPSS Software used to analyze all the data based on the objective of the study.

3.3. Pilot Study

Pilot study is useful to ensure the reliability of the instrument if it is a new measurement tool or consists of newly developed questions. A pilot study was conducted with a sample of 14 purposively selected IT and business directors to test reliability of the questionnaire. Moreover, it helps to ensure whether the instruments are free of ambiguity and irrelevant items. Pilot study is also valuable for controlling bias in data interpretation prior to distributing the survey questionnaire to the actual full-scale group. The survey participants were selected from IT and business units by considering their expertise and knowledge in relation to IT-business alignment. One to one discussion was held with the pilot study respondents prior to distributing the questionnaires. All of the participants filled the questionnaire, which indicated 100% response rate of the pilot study. Once the questioner was filled, the feedbacks were gathered from the participants. In accordance with the pilot test feedbacks, the questionnaire was amended to improve the clarity of the questions, minimize data interpretation bias and increase the likelihood of success. Further, to measure the internal consistency of the questionnaire, reliability test was conducted. Accordingly, Cronbach's coefficient alpha was used as a reliability criterion with the help of SPSS. Accordingly, Cronbach's Alpha is the most common measures of the reliability of the internal consistency. As per Norman (2003, p.219), this coefficient ranges between 0 and 1, with a high value indicating a high level of consistency among the items. In view of that, the result (.897) obtained is greater than 0.70 which is the minimal alpha value to prove the internal consistency and reliability. Hence, the Cronbach's alpha test is an indication that the survey questionnaire's reliability and internal consistency to use for the study as can be seen in table 5.

Table 5: Reliability Statistics based on the Pilot test data

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.897	.897	50

Source: Own survey, 2018

3.4. Data Analysis and Presentation Method

The quantitative data is collected from the identified areas of data sources, edited, organized, and analyzed using SPSS version 24 based on appropriate statistical methods and tools. Descriptive statistics methods such as frequency distribution, mean calculation, cross tabulation and graphical representations are used to summarize the collected data. To analyze the significance of differences among identified constructs, inferential statistics such as chi-square, Kendall's tau-b, Spearman bivariate correlation and principal component analysis have been used. Principal component analysis has criteria to test the reliability of the data prior to conducting automated software ranker and classifier. Next, data screening and sampling adequacy tests were conducted. The data screening was conducted using Correlation matrix (R-matrix) which contains the Pearson correlation coefficient between all pairs of survey questions including the level of significance. In addition, Kaiser-Meyer-Olkin measure of sampling adequacy, Bartlett's test of sphericity, and anti-image correlation and covariance matrices were investigated. Moreover, reliability analysis has been conducted using Cronbach's Alpha test to measure the reliability and internal consistency of the survey. Based on the above tests, the survey data is found to be appropriate for conducting principal component analysis. In the process, automated software ranker was used to rank constructs contributing to IT-business alignment maturity on the basis of their importance. Moreover, automated software classifier was used to help classifying the ranked factors contributing to IT-business alignment maturity.

Document analysis is also conducted in addition to the quantitative data analysis in order investigate the alignment of the business and IT strategy documents and also how IT is helping in towards the achievement of business strategy.

3.5. Quality of Research

The quality of a research can be evaluated using its reliability and validity. The reliability and validity of the study is further discussed below.

3.5.1. Reliability of the research

In this study, a standard survey questionnaire is used for majority of the constructs which is developed by Luftman (2012). In addition to the standard questionnaire, the researcher designed questionnaire items for the construct that is identified in this study. Hence, conducting pilot study became paramount to ensure the reliability and validity of the questionnaire items. Accordingly, pilot study was conducted prior to distributing the survey to the actual survey participants. The Cronbach's alpha coefficient (.897) indicated that the survey questionnaire is reliable since it is greater than 0.7 which is the minimal alpha value. Subsequently, the reliability test conducted again using the full scale data and the result (0.943) revealed the internal consistency and reliability of the survey instrument.

3.5.2. Validity of the research

According to Kerlinger and Lee (2000), validity can be measured in the form of content and construct. Content validity assesses how well the survey instrument items address the problem being investigated. In order to assess the content validity of this research, IT and business professional who are believed subject matter experts evaluated the items of the survey questions and also the interview outline. Hence, the instruments were revised based on the subject matter experts' feedback collected through a focus group discussion.

Construct validity is an assessment of the constructs whether they measured the dependent variable or not. In this study, principal component analysis is used to assess constructs' validity, rank the constructs based on their importance to IT-business alignment maturity. The study revealed that out of forty-three, thirty-seven sub-variables found to be relevant to determine IT-business alignment maturity.

CHAPTER FOUR

Data Presentation, Analysis and Discussion

This chapter is dedicated for the data presentation, analysis and discussion based on the data obtained from the survey questionnaire and various documents with respect to the objective of the study and the previous researches conducted in the area of IT-business alignment. The first section incorporates quantitative data presentation, analysis and discussion and the second part consists of the case organization's business and IT strategy documents analysis and discussion.

In the quantitative data presentation, analysis and discussion section, characteristics of the respondents, the reliability test result, IT-business alignment maturity level, and analysis of the independent variables are also presented, analyzed and discussed. Besides this, principal component analysis is conducted and discussed with the objective of identifying the determinants of IT-business alignment maturity. In the qualitative data presentation, analysis and discussion section, the business strategy is analyzed and discussed with the purpose of evaluating how the IT strategy contributes towards successful implementation of business strategies and help achieving business strategy. Moreover, triangulation is conducted by referring the findings of quantitative analysis in the qualitative discussion and vice versa.

4.1. Quantitative Data Presentation, Analysis and Discussion

4.1.1 Characteristics of the respondents

The survey questionnaire collected demographic data that may have some implication on IT-business alignment maturity. The demographic data is pertaining to the division's domain by segregating it as IT and business, department/ section, the job position and service year of the respondents. The characteristics of the respondents are discussed in this section of the current chapter.

4.1.1.1. Distribution of Respondents by Domain (Business/ IT)

The study used information collected from a total of 218 employees of Ethiopian Airlines. The data collection is streamlined by having stratified sampling from the strata of business and IT. As presented in Figure 5, about 68% of the employees are working in various divisions under the domain of business while the remaining 32% work in the IT division.

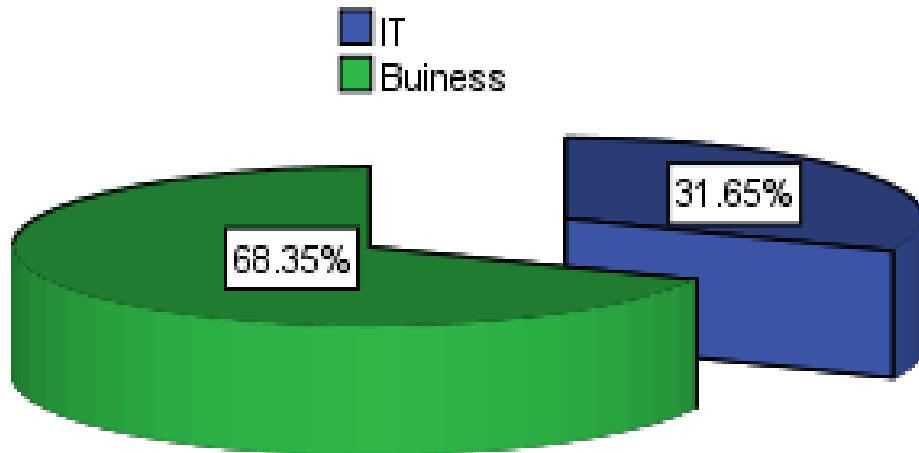


Figure 5: Working domain (Business/ IT) of the respondents (Source: Own survey, 2018)

4.1.1.2. Distribution of Respondents by Department/ Section

The distribution of the respondents who contributed completed survey questionnaire with respect to their department/ section are shown in Figure 6. The sample size from each department/ section was determined based on the number of employees in each of the divisions using stratified sampling. On the one hand, management and non-management employees from IT division participated in the survey of the study by considering their expertise with respect to IT-business alignment. On the other hand, only management employees who are working on the various business divisions are participated on the survey in order to get the right respondent to achieve the target of the study. Accordingly, around 32% of the respondents were from IT division which consists of both management and non-management employees. The respondents from maintenance and repair overhaul (MRO) (24.3%) represent the largest participants in number

among all business divisions based on the population size of the management employees in the division. As can be seen in the below figure, all of the divisions are represented by proportional number of respondents according to the population size of the divisions. This implies good representation of each of the business and functional units of Ethiopian airlines based on the proportional size of the target population; which helps to minimize bias and ultimately ensure reliable information by employing representative sample.

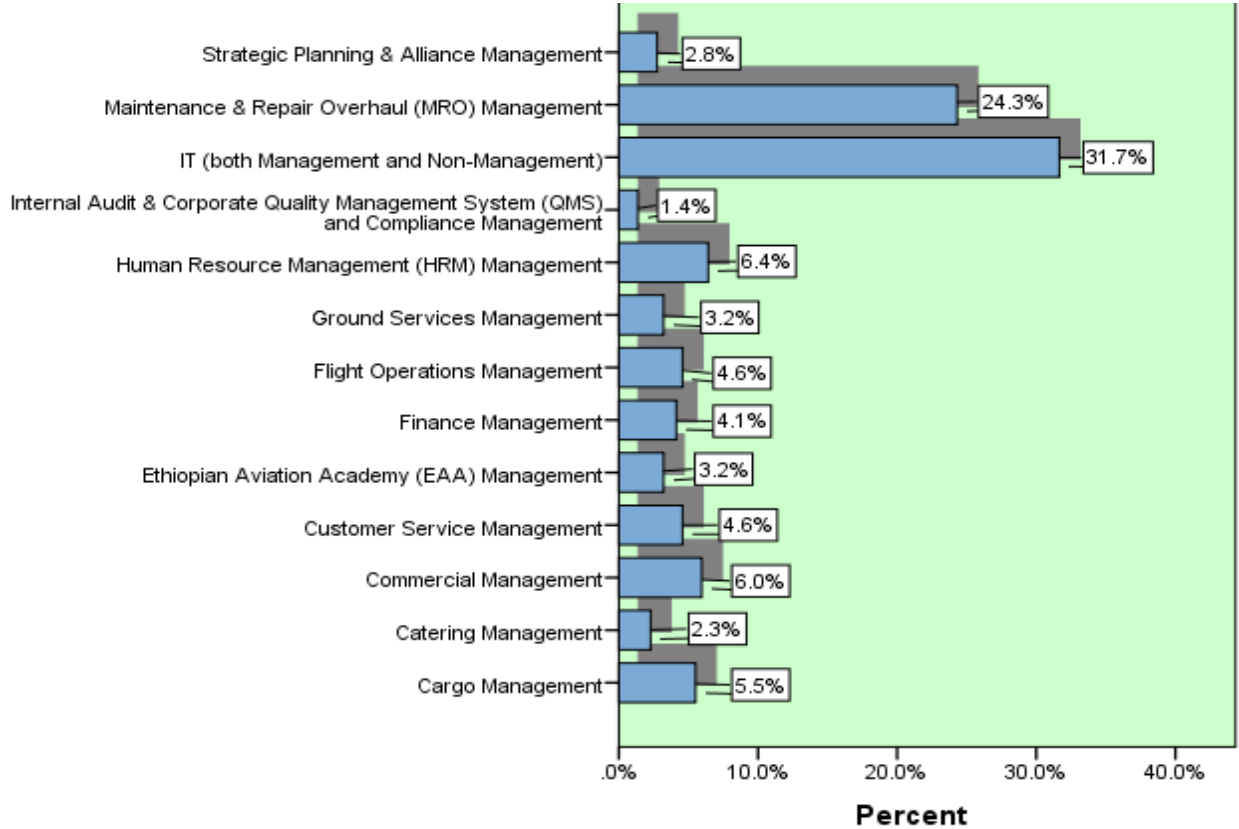


Figure 6 : Distribution of the respondents by department/ section (Source: Own survey, 2018)

4.1.1.2. Distribution of Respondents by job position

The data pertaining to the distribution of the respondents with respect to their current job position is depicted in Figure 7. As the figure depicts team leaders and managers represent the highest in number which are 36.2% and 30.7% respectively according to the population size of the positions. All positions represent management positions but the non-management position from IT which

constitutes 17.4% of the total respondents. The next highest category of the respondents are heads of their respective departments which represents close to 7.3% of the total respondents. Subsequently, directors constitute close to 5.7% of the respondents. The unit leaders position which is found only in the customer service division represents (1.4%) of the total respondents. Finally, senior management is represented by 0.9174%. This indicates that the quantitative survey incorporates employees with different levels of positions to confirm the representation of the sample and also to investigate the impact of the position of an employee on the responses of IT-business alignment maturity of Ethiopian airlines.

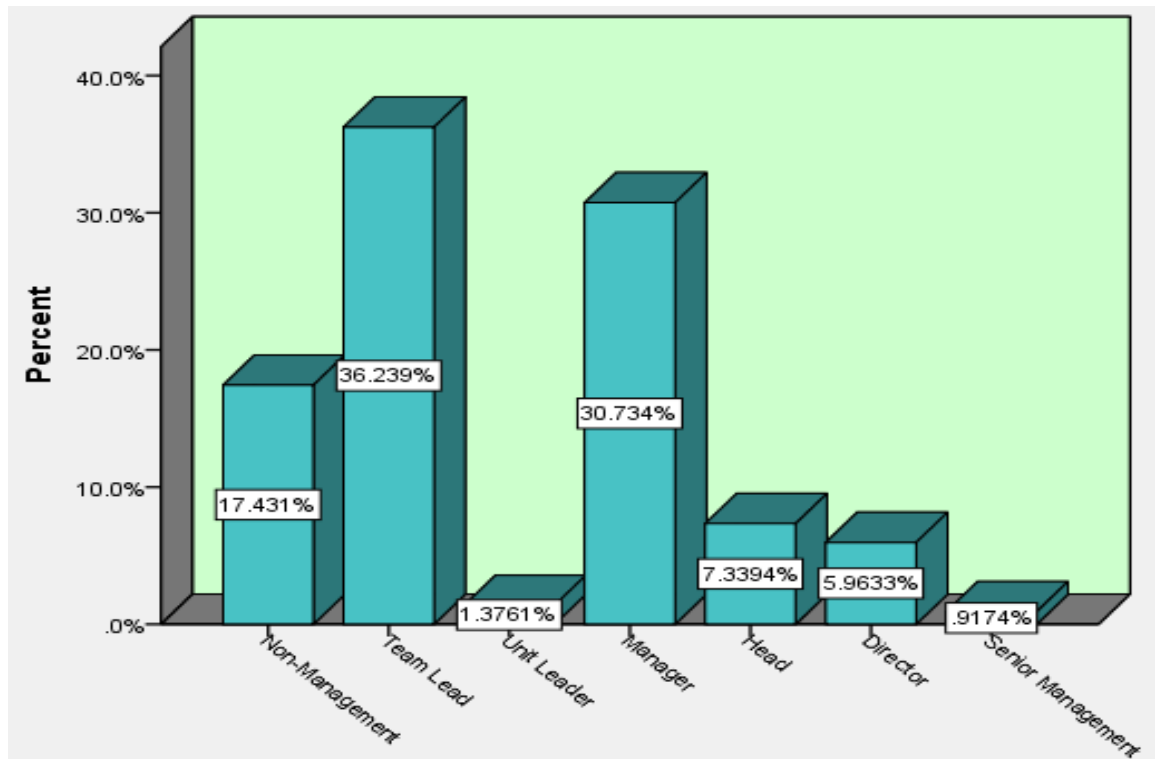


Figure 7: Job positions of the respondents (Source: Own survey, 2018)

4.1.1.3. Distribution of Respondents by Service Year/ Work Experience in Ethiopian Airlines

Service year is a pertinent information which explains how well an employee is experienced and stayed in the organization to be able to understand the IT and business alignment issues. In view of this, work experience related demographic data of the respondents is captured in the survey questionnaire which is depicted in figure 8. As indicated in the figure, close to 77% of the

respondents are well experienced with service year above five years, from which 33.4% worked between six to ten years, 11.5% worked eleven to 15 years and 34.4% served above fifteen years in the airline. This denotes that the survey incorporated experienced employees of the company in order to get more accurate information in relation to the extent of IT-Business alignment and related aspects as workers have longer exposure to the working environment. Only about 21.6% have an experience between two and five years which indicates the representativeness of the sample considered in this study.

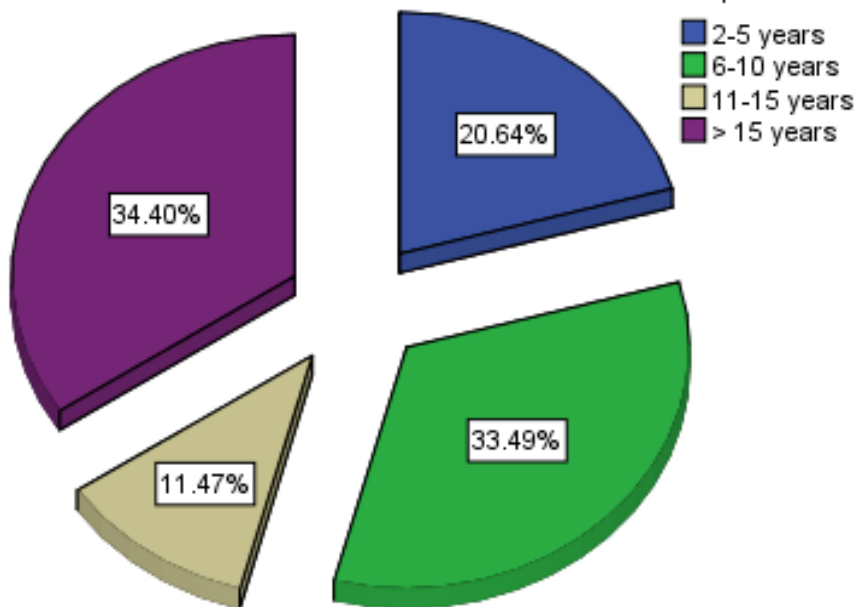


Figure 8: Service Year/ Work Experience of the respondents in Ethiopian Airlines (Source: Own survey, 2018)

4.1.2 Reliability Test

Reliability of the information gathered through the survey is important in determining the internal consistency of subjects in the survey items. Cronbach’s Alpha is the most common measures of the reliability of the internal consistency. As per Norman (2003, p.219), this coefficient ranges between 0 and 1, with a high value indicating a high level of consistency among the items. However, it is possible to get a large value of alpha by having large number of items, not because the scale is reliable (Field 2005, p. 668). This study made Cronbach’s alpha test for the overall as

well as for each of the dimensions to get more valid reliability. As can be seen in table 6, the reliability of the overall data (.943) is closer to one; implying that the information collected through the survey questionnaire is more reliable.

Table 6: Cronbach’s Alpha Reliability Test

Reliability Statistics		
Item Category	Cronbach's Alpha Based on Standardized Items	N of Items
Communications	0.674	6
Value Analytics	0.843	8
IT Governance	0.750	5
Partnership	0.721	6
Scope & Architecture	0.697	5
Skills	0.835	7
IT Investment	0.713	6
Overall	0.943	43

Source: Own survey, 2018

Reliability test is also conducted for each component of the determinants. As presented in Table 6, the reliability of value analytics (0.843), IT governance (0.75), partnership (0.721), skills (0.835) and IT investment (0.713) have a value of greater than 0.7 each which indicates the internal consistency of the survey instrument with respect to these variables. However, communication and scope & architecture with Cronbach’s alpha value of value of 0.674 and 0.697 respectively shows lack of internal consistency in the standard questionnaire which needs further improvement in the future studies.

4.1.3 IT-Business Alignment Maturity in Ethiopian Airlines - Construct Level

This section explores the extent of the determinants of IT-Business alignment in the organization item by item. In all the cases the mean scores and standard deviations are presented. The mean score tells us the maturity level of the organization in terms of each of the constructs. The standard deviation describes the variability of the response from the mean score. The lower variability

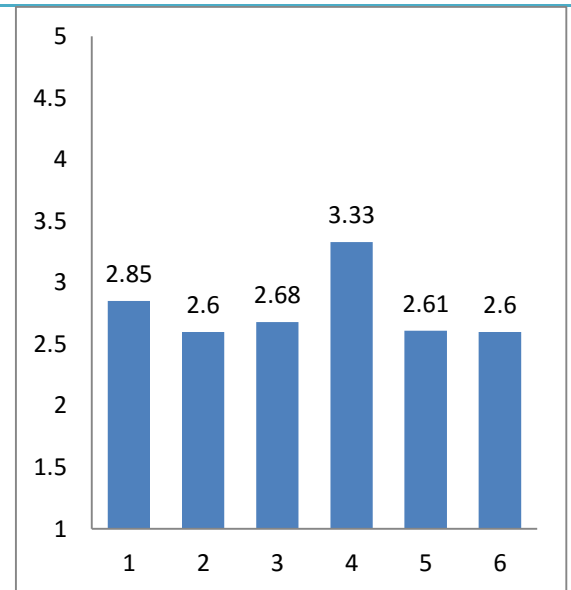
implies the concentrated response by the majority toward the mean score. That is, the majority of the respondents are in agreement of the mean score. The constructs (independent variables) that are analyzed here are: Communications, value analysis, IT Governance, partnership, scope & architecture, skills and IT-investment.

4.1.3.1. Communication Maturity

As indicated in appendix D, there are six sub-variables under the construct of communication that are investigated under this study. These are understanding of business by IT, understanding of IT by business, inter-organizational learning/ education, protocol rigidity, knowledge sharing, and liaison (business transformation) effectiveness. In line with this, the questionnaire rating of the components of communication construct is summarized in table 7 and also further discussed in the subsequent paragraphs.

Table 7: IT and Business Communications Maturity

No	Items	Mean Score	Std. Dev.
1	Understanding of Business by IT	2.85	.505
2	Understanding of IT by Business	2.60	.666
3	Inter-organizational Learning/Education	2.68	.835
4	Protocol Rigidity	3.33	.791
5	Knowledge Sharing	2.61	.859
6	Liaison (Business Transformation) Effectiveness	2.60	.849
Overall Communication Maturity		2.78	0.47



Source: Own survey, 2018

According to Luftman (2000), communication gauges the level and effectiveness of the exchange of ideas, information, and knowledge between IT and the business. Communication helps both IT and business to understand the respective strategies, business plans, working environments, priorities and associated risks.

As can be seen in table 7, the mean value of understanding of business by IT is 2.85 which indicates on average senior and mid-level IT managers have limited understanding of the business. In line with this, one of the questionnaire items of skill construct attempts to measure the ability of IT to attract and retain the best business and technical professionals. The overall response of the respondents for this particular item indicated that IT is hiring for the technical expertise rather than both business and technical expertise. This is related with the business understanding of the IT since hiring and retaining is the base to have the best IT professional with both IT and business skills. The IT team needs to have a clear understanding of the business in order to deliver the necessary IT infrastructure and systems which enables the business. Moreover, when the IT division clearly understands the business they can talk the same language and communicate with the business which helps not only to enable the business but also to derive the business by benchmarking, adopting and innovating new ways of doing business through IT solutions (Coltman, 2015; Sledgianowski, 2005).

The understanding of IT by business is another crucial component of communication which determines IT-business alignment. In view of this, the survey questionnaire gathered data regarding the understanding of IT by business with mean value of 2.6. This indicates on average the senior and mid-level business managers have little understanding of IT. In line with this, several studies revealed that the business needs to have a clear understanding of IT in order to utilize an existing IT infrastructure and systems, properly communicate with IT to adopt new IT solutions based on the dynamic change of the competitive business world (Alaceva & Rusu, 2015; Chebrolu & Ness, 2013; Luftman, 2012). Hence, understanding of IT by business is one of the improvement areas in order to improve the overall IT-business alignment maturity of the firm.

Majority of the respondents (94.9%) responded that the methods that are used to promote organizational learning occurs through ad-hoc and informal methods. This implies that the communication in this regard needs improvement in order to ensure formal, unifying and bonding methods of organizational learning and further define feedback measures which helps to monitor and promote effectiveness of learning.

According to the survey, the style and protocol of IT and business communication has a mean value of 3.33 which indicates two-way, formal and inflexible. Based on Luftman's (2000) SAM

model the style and protocol should progress towards two-way, informal and flexible in order to facilitate smooth communication which ultimately enhances IT-business alignment.

Researchers argued that, knowledge sharing is another important factor that determines the maturity of IT-business alignment (Coltman, 2015; Luftman, 2000; Luftman, 2012). In line with this, 94% the mean result of the respondents indicated that the knowledge sharing structure is beginning to be created in Ethiopian airlines. Due to having sporadic and inconsistent knowledge sharing, business perceives that IT does not effectively understand the business operations, processes and required changes. This finding is in line with Seble's (2015) finding, who studied knowledge management maturity at Ethiopian airlines, which revealed that Ethiopian airlines is at the beginning stage of structured knowledge sharing practices. Knowledge transfer is one of the strategic initiatives of Ethiopian Airlines (Vision 2025 and Strategic Road Map, 2009). In line with this, there are coaching initiatives started in the organization to structure and standardize knowledge sharing in department level. Hence, there is a demand for formal sharing of knowledge at the functional unit level, corporate level, and with business partners/ alliances which can be considered as one of the initiatives among others, to improve IT-business alignment. Since the airline industry operates in a highly turbulent and dynamic environment, ensuring ongoing knowledge sharing across the organization is paramount.

The last sub-variable of communication construct measured the role and effectiveness of IT and business liaisons (business transformation) in Ethiopian airlines. According to the responses of the respondents, the mean value of the liaison effectiveness is 2.6 which indicated that the business transformation team who are working as a bridge to liaison IT and business are in beginning stage and also they are not facilitating the relationship development among the team in the organization based on Luftman's (2012) SAM model. The organization established a business transformation section under IT applications design and delivery department which is in its infancy stage. Hence, the section needs to be strengthened to regularly liaison and facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT with the primary objective of facilitating relationship development across the organization and external partners.

The overall maturity level of communication construct is found to be 2.78 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. According to Luftman's (2012) SAM model, the result is categorized in level 2 (beginning/ committed) process forwarding

to level 3 (established/ focused) process. In view of this, it has been argued that communication plays a significant role in having improved IT-business alignment maturity which ultimately determines the business performance of organizations (Alaceva & Rusu, 2015; Coltman, 2015; Luftman, 2000).

4.1.3.2. Value Analytics Maturity

Value analytics construct consists of IT metrics, business metrics, integrated IT and business metrics, SLA, external benchmarking, formal assessments/ reviews, continuous improvement, and IT function contribution sub-variables. Several researchers, including Coltman, (2015), Luftman (2012), and Sledgianowski & Luftman (2005) assert measurement of competency and value of IT is considered as the main determinants of IT-business alignment. This is due to the fact that organizations should analyze their performance and operations of business and IT in order to measure where the organization stands against their defined objectives and targets (Luftman, 2012). Accordingly, the result of survey questionnaire is summarized and presented as shown in table 8 with respect to the competency and value of IT construct and also further discussed below.

Table 8: Measurement of the Competency and Value of IT Maturity

No	Items	Mean Score	Std. Dev.
1	IT metrics	2.28	.766
2	Business Metrics	2.28	.813
3	Integrated IT and Business metrics	2.28	.732
4	Service Level Agreements	2.65	.754
5	External Benchmarking	2.75	.655
6	Formal Assessments	2.72	.658
7	Continuous Improvement	2.76	.643
8	IT function contribution	3.17	.642
Overall Value Analytics Maturity		2.61	0.46

Source: Own survey, 2018

According to the finding of the study, the metrics and processes used to measure IT's contribution to the business is 2.28 on average which is interpreted as having technical and cost efficiency measures with no formal feedback processes in place to review and take action based on the results of the measures. With the same analogy, the business metrics mean value is also found to be 2.28 which indicates that Ethiopian airlines is concerned with cost efficiency measures at the functional level only with no formal feedback processes in place to review and take action based on the results of the measures. The third sub-variable of value analytics measures the use of integrated IT and business metrics. The study revealed the same mean value (2.28) with the IT and business metrics which indicates that the value measurement of IT and business are not linked each other. In line with this, Luftman (2012) emphasized that IT needs to demonstrate its value to the business in terms that the business understands which indicates having integrated IT and business metrics to measure the contribution of IT to the business.

SLA is the fourth sub-variable of value analytics incorporated in the survey questionnaire. The mean value of SLA is 2.65 which indicates on average SLAs that exist between IT and functional units are primarily technically oriented such as response time, length of computer downtime, etc. According to Luftman (2012), SLAs should be expressed in terms that the business understands and accepts. Moreover, SLAs needs to show the related rewards and penalties for surpassing or missing the defined objectives. Hence, SLAs have to be redefined in Ethiopian airlines in such a way that the business understands and accepts.

External benchmarking is the fifth sub-variable of value analytics addressed in the survey questionnaire. Benchmarking helps to assess other companies' business processes across the industry so that a firm can adopt best practices to improve its processes (Coltman, 2015). As can be seen in table 8, the mean value of external benchmarking is 2.75 which indicates that the organization occasionally perform formal benchmarking such as environmental scanning, data gathering & analysis and determining best practices. Moreover, the finding indicates that Ethiopian airlines rarely take action based on the findings. Based on Luftman's (2012) SAM model, companies should make regular and formal benchmarking in place and have regulated process to take action and measure the changes based on the findings.

Assessment and review of IT systems is the sixth sub-variable of value analytics gathered through the questionnaire. As can be seen in table 8, the mean value of formal assessment is 2.72 which

indicates that assessment and review of IT systems are becoming routine occurrences in Ethiopian airlines. Previous studies revealed that formal assessments and review of IT systems should have a formal process and conducted regularly in order to ensure continuous improvement of the organization. Moreover, the studies insisted firms to have a formal process in place to make changes based on the finding of the assessments and measure changes (Coltman, 2015; Luftman, 2012; Sledgianowski & Luftman, 2005).

The practice of IT-business continuous improvement is presented as the sixth sub-variable of value analytics. The finding of continuous improvement indicated a mean value of 2.72 which indicates that Ethiopian airlines has few continuous improvement practices in place and also effectiveness measures are emerging. As Luftman's (2000) SAM model indicated, organizations should have regular IT-business continuous improvement practices and effectiveness measures by making quality circles and quality reviews in place.

The contribution that the IT function has made to the accomplishment of Ethiopian airlines' strategic goal is the seventh sub-variable of value analytics. Based on the finding of the study, 82.1% of the respondents replied that the contribution of IT function is neither weak nor strong. This indicates the demand for intervention to improve the contribution of IT function towards achieving strategic objective of the organization.

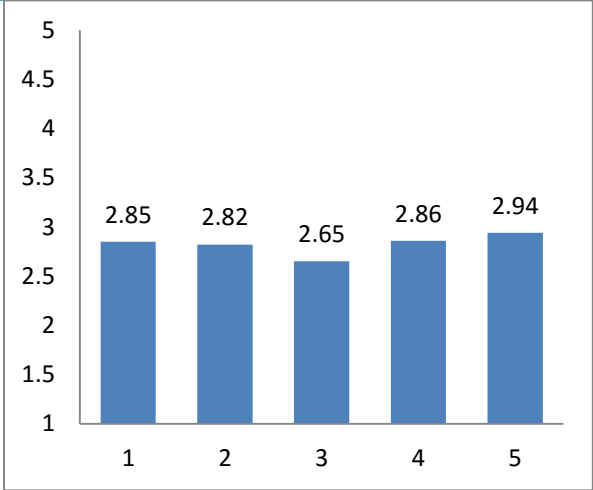
The overall maturity level of value analytics construct is found to be 2.61 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. According to Luftman's (2012) SAM model, the result is categorized in level 2 (beginning/ committed) process forwarding to level 3 (established/ focused) process. In view of this, it has been argued that defining balanced and integrated competency/ value measurement that can be understood by IT and business team can improve IT-business alignment maturity of organizations. Correspondingly, organizations are required to make regular and formal benchmarking processes in place in order to adopt best practices from the industry which helps to ensure continuous improvement in the IT systems and infrastructure and ultimately strengthen the contribution of the IT function towards achieving strategic business goals (Alaceva & Rusu, 2015; Coltman, 2015; Luftman, 2000).

4.1.3.3. IT Governance Maturity

IT governance construct defines the formal process of IT related decisions at strategic, tactical and operation level of the organization (Luftman, 2012). Accordingly, this construct consists of five sub-variables which are business strategic planning, IT strategic planning, Steering committee, IT-projects prioritization process and IT reaction capacity. In relation to this construct, the mean and standard deviation result of the data gathered through the survey questionnaire is compiled as can be seen in table 9 and also further discussed in the subsequent paragraphs.

Table 9: IT Governance Maturity

No	Items	Mean Score	Std. Dev.
1	Business Strategic Planning	2.85	.723
2	IT Strategic Planning	2.82	.739
3	Steering committee	2.65	.825
4	IT Prioritization Process	2.86	.788
5	IT Reaction Capacity	2.94	.649
Overall IT Governance Maturity		2.86	0.53



Source: Own survey, 2018

Based on the finding of this study, the mean value of business strategic planning with participation of IT is 2.85 since IT is being involved in the strategic planning after the business strategy is formulated by c-level business executives with the help of external consultants.

As can be seen in table 9, The IT steering committee’s mean value is 2.65 which explains that the C-level IT and business management members meet informally as needed basis to discuss about IT projects. According to Luftman (2012), having formal and regular committee meetings with demonstrated effectiveness helps to increase the success rate of IT related projects with ultimately improve organizations’ IT-business alignment maturity.

In relation to IT projects prioritization, respondents were requested to assess how the decision is being made in this regard. Their responses show that the decision is determined by the business

which lacks the benefit that can be harvested by having mutual decision by the senior IT and business management team members. Hence, IT related projects prioritizations is one of the improvement area which should be handled mutually by the business and IT top level management members with consideration of the priorities of business partners/ alliances in order to choose impacting projects that help to achieve the strategic goals of the business.

The respondents were asked for their view regarding the ability of the IT function whether it react and respond to the dynamic changes of the business environment. Accordingly, by considering the mean value, the study revealed that the IT reaction capacity is neither weak nor strong which is identified as one of the improvement areas.

To this end, the overall maturity level of IT governance is rated as 2.8 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. Naidoo (2011) studied the IT-business alignment maturity at Volkswagen company located in South Africa. In line with this study, Naidoo (2011) also found the maturity of IT governance to be at level 2. Abdusalam (2018) found the maturity of IT governance to be 2.59 for Ethiopian private banks. According to Luftman's (2012) SAM model, the result is categorized in level 2 (beginning/ committed) forwarding to level 3 (established/ focused) process. Several scholars argued that IT governance is the most crucial factor affecting IT-business alignment maturity in organizations (Gerow, 2014; Luftman, 2012, Sledgianowski & Luftman, 2005). Luftman (2012) further explains the importance of developing an integrated enterprise-wide strategic business plan for IT in order to facilitate clear understanding of the business so that IT can enable and further drive business processes and strategies in order to achieve better business values.

4.1.3.4. Partnership Maturity

Luftman (2012) argued that the partnership that exists between IT and business is another factor that determines the maturity of IT-business alignment. In this regard, Luftman (2012) identified sub-variables of partnership construct which are: business perception of IT value, role of IT in strategic planning, shared goals, risks, rewards/ penalties, managing the IT/ business relationship, relationship & trust, and business sponsors/ champions. Accordingly, the result of survey

questionnaire is summarized and presented as shown in table 10 with respect to the partnership construct and also further discussed below.

Table 10: Partnership between IT and Business Functions Maturity

No	Items	Mean Score	Std. Dev.
1	Business Perception of IT Value	3.03	.591
2	Role of IT in Strategic Business Planning	2.85	.634
3	Shared Goals, Risk, Rewards/Penalties	2.94	.500
4	Program Management	2.69	.660
5	Relationship/ Trust Style	2.93	.521
6	Business Sponsor/Champion	2.92	.787
Overall Partnership Maturity		2.89	0.40

Source: Own survey, 2018

According to the finding of this study, significant number of respondents (82.6%) responded that IT is perceived as a fundamental enabler of the business future activity with mean value of 2.89. Similarly, the second sub-variable evaluated the role of IT in strategic business planning. The finding indicated a mean result of 2.85 that shows IT is used to enable business processes. Based on Luftman’s (2012) strategic model, IT should be perceived as a fundamental driver of future business activity in order to ensure better maturity of IT-business alignment. This indicates that IT can bring new ways of doing business, process and deliver products and services, communicate with customers and also compete in the business arena (Avolio et al., 2000; Chebrolu & Ness, 2013). Besides IT should be perceived as a partner with the business to drive strategic business objective and also bringing value to the firm (Luftman, 2012).

Respondents were asked to evaluate the sharing of risks and rewards associated with IT-based initiatives. Accordingly, 80.3% of the respondents replied that sharing of risks and rewards are emerging. Likewise, the mean result of this sub-variable is 2.94 which shows the emerging of shared risks and rewards. As discussed in value analytics construct SLAs that are defined between

IT and business should clearly show the risks, rewards and penalties for surpassing or missing the defined objectives, key performance indicators and balanced score cards (Luftman, 2012).

Formal IT-business relationship management is the other sub-variable of partnership construct. The finding of the study indicated that the mean result of the program management is 2.69 which revealed that Ethiopian airlines has defined programs to manage IT and business relationships, but the business does not always comply with them. Similarly, the relationship and trust of IT and business was also measured and the result indicated a mean result of 2.93 which shows that IT is emerging as a valued service provider.

The last sub-variable of partnership construct evaluated the business sponsors/ champions for IT-based initiatives. The result indicated that IT based projects often have senior level IT and business sponsors at functional level. This indicates an improvement opportunity of IT-business alignment by having corporate level business sponsor champion or CEO which ensures the success of IT based programs and projects (Gerow, 2014; Luftman, 2012).

As reflected in table 10, the overall maturity level of partnership construct is rated as 2.89 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. Naidoo (2011) studied the IT-business alignment maturity at Volkswagen company located in South Africa. In line with this study, Naidoo (2011) also found the maturity of partnership to be 2.94. Abdusalam (2018) found the maturity of partnership to be 2.55 for Ethiopian private banks. According to Luftman's (2012) SAM model, the result is categorized in level 2 (beginning/ committed) forwarding to level 3 (established/ focused) process. In relation to having balanced metrics, defining clear risks and rewards can improve the partnership of business and IT. Moreover, Ethiopian airlines should have defined programs to manage partnership between IT and business and also both parties should comply with the defined programs. Luftman (2012) further explains the importance of developing an integrated enterprise-wide strategic business plan for IT in order to facilitate better relationship and partnering across the organization which is a foundation to lay the groundwork for external partnerships with suppliers and customers.

4.1.3.5. Scope & Architecture Maturity

Scope & architecture construct refers to the IT maturity that measures the flexibility of IT to provide customizable solutions to the dynamic and ever changing customer needs. The construct has five sub-variables which are: Scope of IT systems, IT standards articulation, scope of architectural integration, architectural transparency to changes, and IT infrastructure flexibility (Luftman, 2012). In line with this, the result of survey questionnaire with respect to the scope & architecture construct is summarized and presented as shown in table 11 and also further discussed below.

Table 11: Scope & Architecture Maturity

No	Items	Mean Score	Std. Dev.
1	Traditional, Enabler/ Driver, External	2.93	.692
2	Standards Articulation	2.84	.684
3	Architectural Integration	2.83	.581
4	Architectural Transparency to Changes	2.89	.659
5	IT infrastructure flexibility	2.88	.657
Overall Scope & Architecture Maturity		2.87	0.44



Source: Own survey, 2018

In order to assess the scope of IT system, respondents were asked where the primary IT systems lie in the spectrum of traditional office support, back office support, business process enabler, business process driver or business strategy enabler/ driver. Accordingly, 64.7% of the respondents replied that the primary systems are business process enablers with mean result of 2.93. This indicated that the scope of IT should be upgraded to a driver of business process in particular and strategy in general (Luftman, 2012). This finding is in agreement with the findings of partnership and IT governance constructs discussed in section 4.1.3.3 and 4.1.3.4.

Responses were received from the respondents regarding the articulation and compliance of IT standards. Based on the survey, close to 80% of the respondents replied that IT standards are

defined and enforced at the functional unit level with emerging coordination across functional units. Moreover, the respondents were asked regarding the scope of architectural integration in which the mean result (2.83) revealed that it is integrated across functional units. In organizations, like Ethiopian airlines, that are operating worldwide, implementing globally integrated standards for hardware and software solutions facilitates establishment of standardized processes. IT standards enable connection among hardware, software and other technology components; which allows easier integration and information sharing across business units and also with partners/alliances (Coltman, 2015; Gerow, 2014). Hence, IT standards should be defined and enforced across the organization and also with joint coordination among strategic business partners and alliances.

In this study, the transparency of the changes that are arising due to business and IT changes such as implementation of new technologies, business processes and merger/acquisition was also assessed. The mean result of this sub-variable is found to be 2.89, which shows that the transparency exists at the functional level. However, the finding asserted that there is lack of transparency across the entire organization and also the business partners and alliances. This is affecting the firm to comply to industry standard changes that happens in the airline industry and also affecting the relationship of Ethiopian airlines with other members of star alliance. In this regard, Luftman (2012) explained that pervasiveness of infrastructure transparency and flexibility helps to leverage IT assets on an enterprise-wide basis. Moreover, it helps to extend the reach of the organization into supply chains of customers, suppliers and business partners/ alliances.

The final sub-variable addressed in scope & architecture construct is the scope of IT infrastructure flexibility to business and technology changes. Based on the finding, with mean value of 2.88, the IT infrastructure is being driven by the requirements of the current business strategy. In an airline industry business arena, organizations are expected to have fast response to dynamic changes in the market place. This requires to view IT infrastructure as a resource that enable and drive fast response to changes in the competitive environment. Hence, the infrastructure of Ethiopian airlines should be enhanced in such a way that reflect flexibility to handle anticipated and also unanticipated business environment changes.

Given the above, the overall maturity level of scope & architecture is rated as 2.87 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. In line with this

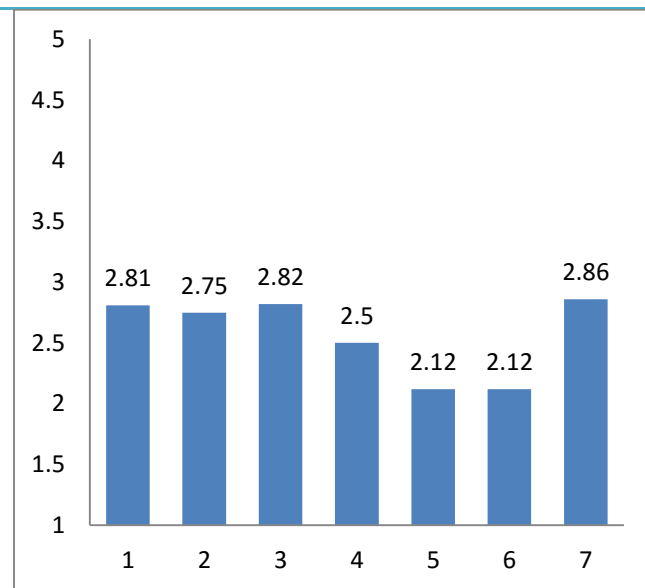
study, Naidoo (2011) found the maturity of scope & architecture to be at level 3. Abduselam (2018) found the maturity of IT governance to be 2.60 for Ethiopian private banks. According to Luftman’s (2012) SAM model, the result is categorized in level 2 (beginning/ committed) forwarding to level 3 (established/ focused) process. Scholars argued that scope and architecture is one most critical element affecting IT-business alignment maturity in organizations (Gerow, 2014; Luftman, 2012, Sledgianowski & Luftman, 2005). Luftman (2012) further explains the importance of enhancing the scope of IT infrastructure to the level of ‘extra-structure’ IT in order to be able to extend the reach of IT not only to the organization but also to external partners/ alliances and suppliers which ultimately facilitate better business values and delighted customers.

4.1.3.6. Skills Maturity

HR skills construct captures HR activities such as hiring, training, performance feedback, innovation encouragement, career opportunities, individual skill development and retention programs exercised in organizations. In line with this, the result of survey questionnaire with respect to skills construct is summarized and presented as shown in table 12 and also further discussed below.

Table 12: HR Skills Maturity

No	Items	Mean Score	Std. Dev.
1	Innovative Entrepreneurial Environment	2.81	.663
2	Cultural Locus of Power	2.75	.746
3	Change Readiness	2.82	.692
4	Career Crossover	2.50	.793
5	Hiring and Retaining	2.12	.628
6	Training/Talent improvement to Learn	2.12	.743
7	Interpersonal Interaction	2.86	.607
Overall Value Analytics Maturity		2.57	0.50



Source: Own survey, 2018

The construct has seven sub-variables which are: innovative entrepreneurial environment, cultural locus of power, change readiness, career crossover, training/talent improvement to learn, interpersonal interaction and hiring & retaining (Luftman, 2012).

In relation to the assessment of innovative entrepreneurial environment, more than half of the respondents replied that entrepreneurship is encouraged at functional unit level. The mean value of this sub-variable is 2.81 as can be seen in table 12. This indicates the demand for further improvement to strongly encourage employees to boost entrepreneurship spirit and leveraging innovative ideas at corporate level and also with business partners/ alliances (Luftman, 2012). Correspondingly, this helps employees to know business processes, IT solutions, policies and procedures of other functional units and come up to innovative ideas in order to solve problems and devise new ways of doing businesses which ultimately improve business value achievement.

The cultural locus of power with respect to making IT-based decisions has a mean value of 2.75 which indicates that the decision is being made by top business and IT management members. However, decisions lack the involvement of the organizations' business partners/ alliances such as Star alliance member airlines and other airlines in which Ethiopian airlines has a significant share. Hence, this can be taken as one of the improvement opportunities in order to improve IT-business alignment maturity.

The organization's readiness for change is one of the critical element that determines the IT-business alignment maturity considering the dynamic and continuous change occurring in the airline industry due to stiff competition, disruptive technology changes, environmental, and political issues. This study revealed that, the change readiness programs providing training and necessary skills to implement change are in place at function unit level. In line with this, Ethiopian airlines established a section called change management under HRM and a section called business transformation under IT that collaborate in managing change that arises due to IT system changes. Yet, it needs further improvement to properly handle changes across the organization and also anticipate changes to proactively handle them.

According to this study, career cross over among IT and business personnel is occurring within functional units only. Scholars asserted that job transfers that are occurring for all position levels at corporate level ensure IT-business alignment maturity (Chen, 2009; Coltman, 2015; Gerow,

2014; Luftman, 2000; Luftman, 2012). Further, Sledgianowski & Luftman (2005) insisted to establish international assignment programs which to place candidate in positions other than their countries to gain broader international experience, learn to make decisions in an international context, and enlarge their leadership experience. Ethiopian airlines assign employees to outstation office worldwide to handle area offices financial and business activities. However, the employees that are getting such opportunities are from few divisions such as commercial & marketing, finance and MRO divisions. Hence, career crossover can be considered as one of the improvement areas to enhance IT-business alignment maturity.

The IT division's ability to attract and retain the best business and technical professional is one of the critical element to ensure IT-business alignment maturity. As can be seen in table 12, the mean of this sub-variable is 2.12 which indicates that IT is hiring focused on technical expertise rather than considering both business and technical aspects. According to Luftman (2012), effective programs should be in place in order to attract and retain best IT professionals with both IT and business skills. Hence, this can be considered as one of improvement areas to improve the maturity of IT-business alignment.

The respondents were also asked regarding opportunities to learn about divisions outside of their functional units. The mean result of this sub-variable is found to 2.12 which shows that the opportunities are dependent on the functional unit. Researches stressed that organizations should avail formal opportunities to employees to learn about the business processes outside of their functional units in view of improving IT-business alignment maturity (Chen, 2009; Luftman, 2012; Sledgianowski & Luftman, 2005).

The last sub-variable addressed under skills construct is interpersonal interaction that exists across IT and business units of Ethiopian airlines. In relation to this, the mean result (2.86) shows that trust and confidence are emerging between IT and business. This indicates, the interpersonal interaction (such as trust, confidence, social, political and cultural environment) needs further to be achieved and extended to external customers and partners (Chen, 2009; Luftman, 2012).

To summarize, the overall maturity level of HR skills is rated as 2.57 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. In line with this study, Naidoo (2011) found the maturity of HR skills to be at 2.9. Abduselam (2018) found the maturity of HR

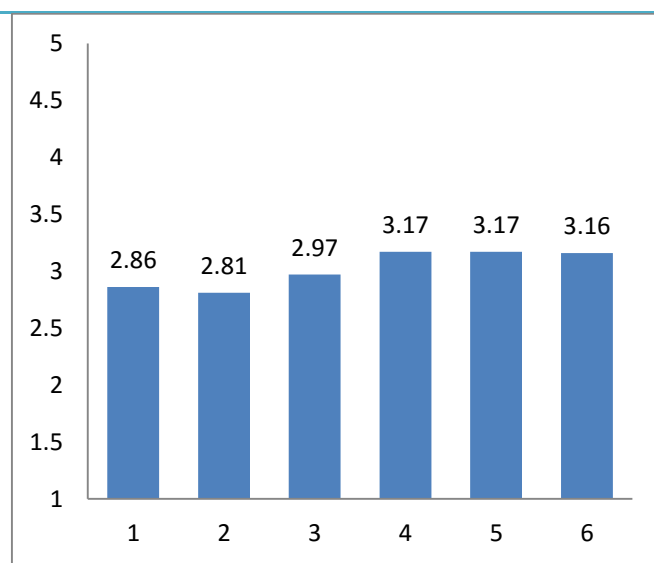
skills to be 2.31 for Ethiopian private banks. According to Luftman’s (2012) SAM model, the result is categorized in level 2 (beginning/ committed) forwarding to level 3 (established/ focused) process. In today’s talent management economy, the success of an organization depends on recruiting, developing, motivating and retaining the right skills at the right time (Chen, 2009; Luftman, 2012). As per the above discussion regarding each of the sub-variables of HR skills, the identified gaps need to be addressed in order to improve the overall IT-business alignment maturity of Ethiopian airlines.

4.1.3.7. IT Investment Maturity

Apart from the constructs of SAM model, interview sessions were conducted in order to identify additional constructs that determine IT-business alignment maturity in the context of Ethiopian airlines. The participants of the interview were IT and business directors who are subject matter experts. As a result, IT investment construct was identified in the process. IT investment refers to the amount of resource that Ethiopian airlines spends on the IT infrastructure and systems in order to enable and also drive the business strategy. In line with this, the result of survey questionnaire with respect to IT investment construct is summarized and presented as shown in table 13 and also further discussed below.

Table 13: IT investment Maturity

No	Items	Mean Score	Std. Dev.
1	IT Investment Decisions	2.86	.692
2	IT Budgeting	2.81	.525
3	Budget Sufficiency	2.97	.567
4	IT investment proper utilization	3.17	.597
5	IT investment ability to improve IT capabilities	3.17	.505
6	IT investment and projects effectiveness	3.16	.587
Overall Value Analytics Maturity		3.02	0.37



Source: Own survey, 2018

IT investment construct has six sub-variables which are: IT investment decisions, IT budgeting, budget sufficiency, IT investment proper utilization, IT investment ability to improve IT capabilities, and IT projects effectiveness.

According to the responses of the respondents, the mean value of IT investment decisions is 2.86 which indicates that the investment decisions are being made primarily by considering as a process enabler. This finding is in agreement with the findings of partnership and IT governance constructs discussed in section 4.1.3.3, 4.1.3.4 and 4.1.3.5. This implies that the IT investment decisions will get improved when Ethiopian airlines views IT as a driver of business effectiveness and a vital tool to create competitive advantage in the business arena. Likewise, the questionnaire incorporated a question how IT budgeting is viewed in the company. The responses indicated that IT is viewed as a cost center with some projects treated as investments. This can also be asserted from the corporate business strategy document, that IT is structure as one of support functional unit instead of a business unit/ profit center with its own profit and loss statements. In view of this, Gerow (2014) emphasized that IT should be viewed as profit center where it generates revenue for the business. As a result, an organization will have a better IT-business alignment and business performance.

The sufficiency of the capital budget allocated for IT programs and projects were also assessed in the questionnaire. The mean result (2.97) asserted that the respondents moderately agree with the sufficiency of the IT capital budget. As can be seen table 14, the capital and operating IT budget is increasing every year considering the dynamic changes of the airline industry even though the finding of this study revealed the need of further improvement.

Table 14: Total IT budget in ETB

Budget Year	Operating budget	Capital Budget
2018/19	366,664,761.13	324,938,473.60
2017/18	247,786,440.99	197,050,988.00
2016/17	144,758,127.74	176,350,079.00
2015/16	193,469,388.30	83,974,959.00
2014/15	109,408,371.12	98,540,900.00

Source: SAP ERP system of Ethiopian airlines

Based on the finding of this study, close to 85% of the respondent moderately agree that the IT investment support and enable organization’s performance. Similarly, the same number of respondents moderately agree that IT investments are helping to create, maintain and improve IT capabilities necessary to establish alignment.

The overall maturity level of IT investment is rated as 3.02 which is the aggregate mean (mean of the mean) result of its sub-variables discussed above. According to Luftman’s (2012) SAM model, the result is categorized in level 3 (established/ focused) process. This indicates that IT should be viewed as business driver and source of competitive advantage in order to improve IT-business alignment maturity. Further, Ethiopian airlines should up-scale the organization of IT division as an independent business unit and consider it as profit center so that IT can be a source of additional revenue to the organization with its own profit and loss financial statements.

In addition, figure 9 visualized diagrammatically the maturity of IT-business alignment constructs in order to see the comparative results and deduce the prioritization of interventions based on the observed level of achievement gap. Accordingly, the figure depicts that value analytics and HR skills constructs scored the lowest among all IT-business alignment constructs.

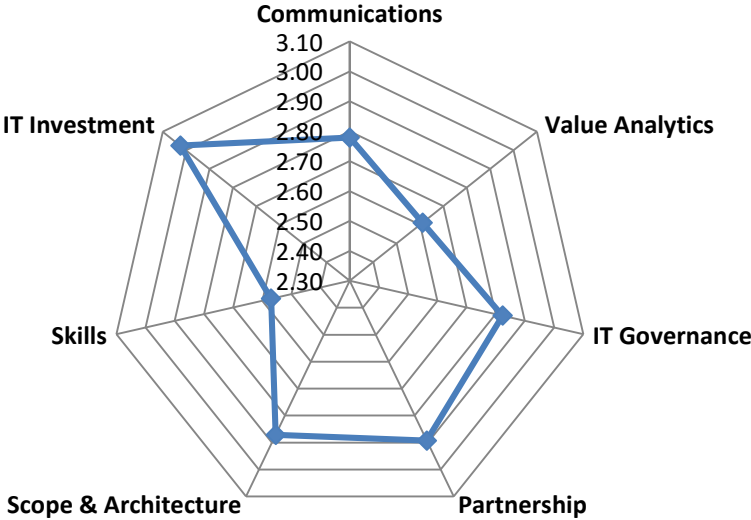


Figure 9: Maturity of constructs of IT-business alignment (Source: Own survey, 2018)

This indicates that value analytics and HR skills constructs need prior intervention in order to improve the overall IT-business alignment maturity of Ethiopian airlines. Further, figure 10 illustrated the maturity of each of the variables that are incorporated in the seven constructs of this study. Based on this, in relation to value analysis metrics, it is clearly depicted that the metrics and processes used to measure IT’s contribution (M1), the business metrics to measure contribution to the business (M2) and integrated IT and business metrics (M3) need due attention as discussed in section 4.1.3.2. Moreover, career crossover, attracting and retaining of IT professionals with both IT and business knowledge, and opportunities to learn outside of employees’ functional unit are the three sub-variables with the lowest maturity that also needs due attention to improve the overall IT-business alignment maturity of Ethiopian airlines.

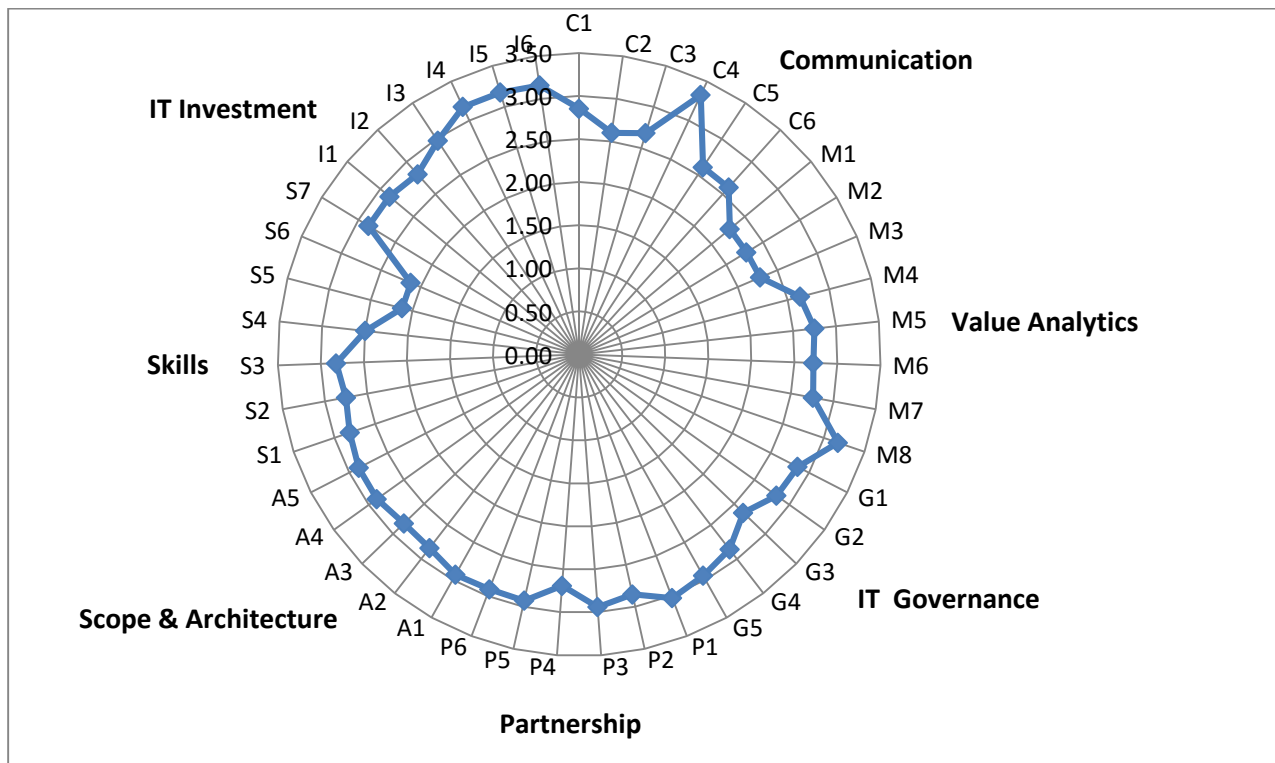


Figure 10: Maturity of Variables of the constructs of IT-business alignment (Source: Own survey, 2018)

4.1.4 IT-Business Alignment Maturity in Ethiopian Airlines - Overall

IT-Business alignment maturity level from the overall ratings of the respondents of the survey is presented in table 16. The majority of the respondents (87.6%) rated the alignment maturity as “average”; 10.1% as “low” and only 5% rated as “high”.

Table 15: Overall IT-business alignment maturity of Ethiopian Airlines

	Frequency	Percentage	Overall Maturity (Mean)	Stand. Dev.
Low	22	10.1	2.92	0.344
Average	191	87.6		
High	5	2.3		
Total	218	100		

Source: Own survey, 2018

The overall mean (2.92) score indicated that the overall IT-business alignment maturity in Ethiopian airlines is within the range of level 2 (committed process) with partial fulfillment of level 3 characteristics (Established/ Focused process). The standard deviation of 0.344 indicates the variability of the respondent’s response in comparison to the average of 2.92. On average, the response of each respondent on the level of IT-Business maturity is 0.344 higher or lower than the mean score. In other terms, their response is concentrated around the mean which shows the uniformity of the responses of the respondents with respect to the alignment maturity of Ethiopian airlines. According to Luftman (2012), level 3 maturity comprises, good understanding and emerging relaxed communications; competency/ value metrics dashboards established with some cost effectiveness; relevant process of governance is established across the organization; IT is seen as process enabler; the scope and architecture of IT is integrated across the organization; and the skills of IT is emerging as service provider. Several scholars asserted that the maturity of IT-business alignment determines the performance of an organization (Alaceva & Rusu, 2015; Henderson & Venkatraman, 1993; Luftman, 2012; Ullah & Lai, 2013e). This implies that the demand on an intervention to enhance the IT-business alignment to level 4 and also extend it to level 5 in order to improve the performance of the organization and also attainment of strategic objectives.

In order to evaluate the survey result by division of their working area and determine the consistency of respondents' view regarding IT-business alignment in Ethiopian airlines, the analysis of the mean value has been performed by grouping the input data based on division. Accordingly, the maturity of the divisions is depicted in figure 11 whereby the maturity of the divisions is almost the same which indicated that the entire organization needs intervention and improvement on the constructs and further variables that determine IT-business alignment maturity.



Figure 11: IT-business alignment maturity by division (Source: Own survey, 2018)

4.1.5 Correlation Analysis

Correlation analysis can be used to see the association between IT-Business alignment and its determinants. Both parametric and non-parametric tests are used to test the correlation. The

parametric correlation coefficient, the Pearson correlation, is used when the sample is representative and the variables are continuous. However, the non-parametric tests, Kendall's tau_b and Spearman's rho, are used when the sample is not representative and the variables are categorical. For robustness check, both approaches are used and the result is presented in Table 17 below.

Table 16: Correlation Analysis of IT-business alignment (Dependent) with its constructs (Independent)

Dep: IT-Business Alignment		Comm.	Value Analytics	IT Governance	Partnership	Scope & Arch	Skills	IT Investment
Pearson Correlation	Coef.	.601**	.708**	.736**	.755**	.736**	.707**	.578**
	Sig.	.000	.000	.000	.000	.000	.000	.000
Kendall's tau_b	Coef.	.477**	.499**	.555**	.509**	.550**	.485**	.356**
	Sig.	.000	.000	.000	.000	.000	.000	.000
Spearman's rho	Coef.	.530**	.567**	.602**	.551**	.591**	.553**	.388**
	Sig.	.000	.000	.000	.000	.000	.000	.000

Source: Own survey, 2018

Note: ** Significant at 1% (2-tailed)

Therefore, the correlation analysis between the six constructs (independent variables) and IT-business alignment maturity (dependent variable) are found to have statistically significant and positive association at 1% level of significance.

4.1.6 Determinants of IT-business Alignment – Principal Component Analysis

In the social science studies, it is often attempted to measure things that cannot directly be measured. Under such a situation and when the number of variables considered are very large principal component analysis (PCA) or factor analysis is very helpful to avoid multi-collinearity countered in using regression, and also reduce a data set to a more manageable size while retaining as much of the original information as possible.

In order to determine whether all the scales used in this study have construct validity, to identify representative variables in the subsequent analysis and evaluate the factors determining IT-Business alignment maturity, PCA has been employed. Additionally, in the context of this study, it helps to calculate factor loadings that provide rankings of determinants of IT-business alignment.

Automated software (ranker) was used to rank factors contributing to IT-business alignment maturity on the basis of their importance. In addition, automated software (classifier) was used to help classifying the ranked factors contributing to IT-business alignment maturity into categories. In order to maintain the validity of the result, a prior reliability test has been undertaken. The first body of output concerns data screening, assumption testing, and sampling adequacy.

Data screening and sampling adequacy tests

R-matrix (or correlation matrix) which contains the Pearson correlation coefficient between all pairs of questions can be produced including the level of significance. To do a factor analysis it is required to have variables that correlate fairly well, but not perfectly. Also, any variables that correlate with no others should be eliminated. That is, variables with correlations greater than .3 and less than 0.9 are considered. In case the coefficient is greater than .9 a problem could arise because of multi-collinearity in the data. However, to perform principal component analysis, multi-collinearity is not a problem. The test result shows that, except one, all questions in the analysis correlate reasonably well with all others and none of the correlation coefficients are excessively large.

In addition to the above test, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy, Bartlett’s test of sphericity and the anti-image correlation and covariance matrices need to be investigated. The anti-image correlation and covariance matrices providing the same information as KMO helps to test sampling adequacy for specific variables. Kaiser (1974) recommends the KMO statistic a bare minimum of 0.5 and the values between 0.5 and 0.7 are considered average, values between 0.7 and 0.8 are considered good, values between 0.8 and 0.9 are considered great and values above 0.9 are considered superb (Hutcheson & Sofroniou, 1999). As indicated in the table that follows, for the data under consideration the KMO value is 0.773, which falls into the range of being good which confirms the adequacy of the sample size for factor analysis.

Table 17: KMO and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.773
Bartlett's Test of Sphericity	Approx. Chi-Square	6955.617
	df	903
	Sig.	.000

Source: Own survey, 2018

It is also possible to have the KMO values for individual variables as produced on the diagonal of the anti-image correlation matrix. In the same way the value should be above the bare minimum of 0.5 for all variables (and preferably higher) and if there is any variables with values below 0.5 then should be excluded from the analysis. For the data considered here, all values are well above 0.5, which indicates the adequacy of the sample size for each of the variables considered. Furthermore, the off-diagonal elements represent the partial correlations between variables and it is expected for a good factor analysis these correlations to be very small. The result from the data is also consistent with this.

Bartlett's measure tests the null hypothesis that the original correlation matrix is an identity matrix. In order to conduct PCA, there must be a relationship between the variables with significance value less than .05. Accordingly, the level of significance of the relationship is tested and the result is .000 as depicted in table 18. Therefore, the null hypothesis is rejected which implies the correlation matrix is not an identity and factor analysis is appropriate.

Factor Extraction, Rotation and Score

According to PCA, not all factors are retained in an analysis and only factors that are statistically important should be retained. The eigenvalues associated with a variate indicate the substantive importance of that factor and only factors with large eigenvalues will retain. There are three different ways to test for factor extraction. The three criteria often provide different solutions. In these situations the communalities of the factors need to be considered. In PCA, the communalities of 1 with all factors are retained first (Here the default Kaiser's recommendation of eigenvalues over 1 is considered for retention). The test indicates that all variables will retain in PCA

Furthermore, the interpretability of factors can be improved through rotation. Rotation maximizes the loading of each variable on one of the extracted factors while minimizing the loading on all other factors. This process makes it much clearer which variables relate to which factors. The exact choice of rotation option depends on researcher's decision that the underlying factors should be related. If there are theoretical grounds to think that the factors are independent (unrelated) then it is possible to choose one of the orthogonal rotations (for instance, varimax). However, if theory suggests that factors might correlate then one of the oblique rotations (direct oblimin or promax) should be selected. In this particular study, since there are theoretical grounds for supposing that factors might correlate, then direct oblimin has been selected (Luftman, 2012).

The result of loading is, therefore, presented as follows with the maximum iteration for convergence is set to 40.

Table 18: Loading results from extraction and rotation

Component/Factors	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total
1	13.680	31.815	31.815	7.156
2	3.568	8.298	40.112	4.028
3	2.485	5.780	45.892	6.740
4	1.983	4.611	50.503	6.187
5	1.871	4.351	54.855	5.154
6	1.620	3.768	58.623	3.830
7	1.468	3.414	62.037	3.751
8	1.273	2.960	64.997	3.294
9	1.106	2.573	67.569	4.752
10	1.056	2.455	70.024	3.029

Source: Own survey, 2018

Extraction Method: Principal Component Analysis (PCA)

Once a factor structure has been found, it is important to decide which variables make up which factors. Factor loadings are a gauge of the substantive importance of a given variable to a given factor. Therefore, it makes sense to use these values to place variables with factors.

The factor scores allow to save factor scores for each case in the data editor. These scores can then be used to identify groups of participants who score highly on particular factors. As discussed above, since there is theoretical reason for some sort of correlations between factor scores are acceptable then the Regression method is appropriate.

It is possible to assess the statistical significance of a factor loading (after all, it is simply a correlation coefficient or regression coefficient); however, there are various reasons why this option is not as easy as it seems (see Stevens, 2002: 393).

Typically, researchers take a loading of an absolute value of more than 0.3 to be important. However, the significance of a factor loading will depend on the sample size. Stevens (2002) produced a table of critical values against which loadings can be compared. To summarize, he recommends that for a sample size of 50 a loading of 0.722 can be considered significant; for 100 the loading should be greater than 0.512; for 200 it should be greater than 0.364; for 300 it should be greater than 0.298; for 600 it should be greater than 0.21; and for 1000 it should be greater than 0.162. These values are based on an alpha level of .01 (two-tailed), which allows for the fact that several loadings will need to be tested (Stevens, 2002). Therefore, in this particular study the sample size is between 200 and 300. Hence, it is good to consider a loading of 0.4. Accordingly, the PCA is conducted with final pattern matrix shown below in table 19. Accordingly, PCA produced an output on the selected 37 variables, which make a contribution of 70.02 of the total variance of IT-business alignment maturity.

As portrayed in table 19, after the factor loading, the variables are categorized to the new construct groupings. Table 19 indicates that the top ranked determinants of IT-business alignment maturity are in the categories of IT Governance; which makes the highest contribution (31.82%) of the total variance explained. This result is in accord with the study of other scholars that proclaimed the importance of IT and business strategic planning in the overall success of IT-business alignment (Alaceva & Rusu, 2015; Henderson & Venkatraman, 1993; Luftman, 2012; Ullah & Lai, 2013e).

Table 19: Pattern Matrix

Factors	IT-Business Alignment Sub-variables	Loadings	Total Variance Explained
IT Governance	IT Strategic Planning	.782	31.815
	Business Strategic Planning	.639	
	Interpersonal Interaction	.635	
	Steering committee	.614	
	Program Management	.476	
	Role of IT in Strategic Business Planning	.451	
	Cultural Locus of Power	.430	
IT investment	IT investment ability to improve IT capabilities	.755	8.298
	IT function contribution	.726	
	IT investment and projects effectiveness	.721	
	IT investment proper utilization	.717	
	Budget Sufficiency	.521	
Value Analytics	Business Metrics	-.876	5.780
	IT metrics	-.827	
	Integrated IT and Business metrics	-.794	
	Understanding of IT by Business	-.470	
	Service Level Agreements	-.412	
Scope & Architecture and Knowledge Sharing	IT infrastructure flexibility	.870	4.611
	Inter-organizational Learning/Education	.493	
	Architectural Integration	.413	
	Knowledge Sharing	.408	
Skills	Training/Talent improvement to Learn	-.657	4.351
	Career Crossover	-.655	
	Hiring and Retaining	-.533	
	IT Investment Decisions	-.466	
	Change Readiness	-.445	
Communication	Protocol Rigidity	.759	3.768
	Liaison (Business Transformation) Effectiveness	.518	
Business Perception of IT Value & Understanding of Business by IT	Traditional, Enabler/Driver, External	-.803	3.414
	Business Perception of IT Value	-.532	
	Understanding of Business by IT	-.449	
Partnership & external benchmarking	Business Sponsor/Champion	.526	2.96
	Relationship/ Trust Style	.524	
	External Benchmarking	.484	
IT projects Prioritization & Setting shared goals	Shared Goals, Risk, Rewards/Penalties	-.942	2.573
	IT Prioritization Process	-.405	
IT Budgeting	IT Budgeting	.805	2.455
Extraction Method: Principal Component Analysis.			
Rotation Method: Oblimin with Kaiser Normalization.			
Rotation converged in 36 iterations.			

Although IT-business alignment maturity determinants of IT investment (8.3%), value analytics (5.78%), Scope & architecture and knowledge sharing (4.61 %), skills (4.35 %), communication (3.77%), mutual understanding of business & IT (3.414), partnership & external benchmarking (2.96), IT projects prioritization & setting shared goals (2.573 %), and IT budgeting (2.455 %) have each lower contribution than IT governance, their overall total percentage contribution of 38.21% is not negligible. In addition, the result in table 19 shows the rankings of IT-business alignment determinants which further discussed in the subsequent paragraphs.

As per the output of the PCA, 31.85% of the total variation of IT-business alignment is explained by IT governance. This indicates that IT governance is a construct with high impact to the overall IT-business alignment success. As discussed in section 4.1.3.3, several literatures asserted the essentiality of proper IT strategic planning, business strategic planning, the role of IT in strategic planning, program management, establishing appropriate steering committee, and setting proper locus of power for business realization through IT (Coltman, 2015; Henderson & Venkatraman, 1993 & Luftman, 2012). In line with this, Ethiopian airlines should give due attention to increase the involvement and the role of IT in business strategic planning so that IT can drive the business.

According to the PCA finding, the next highest determinant construct of IT-business alignment is IT investment. As shown in table 19, IT investment makes contribution of 8.3% of the total variance. This indicates that allocation the right amount of resource for IT infrastructure, IT systems including IT spending for employees is critical in order to support, enable and further drive the business and its performance. Thus, IT investment is the second important construct that can make a significant improvement on IT-business alignment maturity.

Value analytics is ranked the third determinant construct of IT-business alignment maturity, which explains 5.78% of the total variance. Scope & Architecture and knowledge sharing is the fourth determinant construct of IT-business alignment maturity, which explains 4.61% of the total variance. Moreover, the PCA result indicates that skills and communication are the fifth and sixth determinants with 4.35% and 3.77% variance explanation respectively.

In general, the PCA output reveals IT-business alignment determinants in a ranked manner; which helps to prioritize and address the issues based on their total contribution share. From this analysis,

it can be noted IT governance and IT investment have the highest contribution in the overall variation of IT-business alignment maturity.

4.2. Qualitative Data Analysis

In addition to the quantitative study, qualitative data analysis is conducted to supplement and enrich the findings obtained from the survey. In view of this, IT strategy, business strategy, SLAs and policies and procedures document analysis has been conducted. Accordingly, the output of documents has been analyzed as presented below.

Ethiopian airlines has formulated “Vision 2025 and Strategic Road Map –Scaling up of ET’s growth Strategy” in 2011 by involving a consultancy company called Earnest and Young. The strategy documents consist of external and internal analysis, the industry’s trend and Ethiopian airlines’ competitive environment, Vision 2025, business strategies, functional strategies, related major projects & infrastructures, and risks and mitigations. According to the strategy document, Ethiopian airlines adopted diversified aviation business model; in which seven business units work as a profit center under the umbrella of the aviation group by having their own profit and loss statements. In view of this, the business units collaborate and work together to ensure the success of Ethiopian Aviation group at large.

The seven aviation business units are: Ethiopian international passenger airlines, Ethiopian domestic Airline, Ethiopian Cargo, Ethiopian MRO, Ethiopian Aviation Academy, Ethiopian In-flight Catering and Ethiopian Ground Services. Besides the seven business units/ profit centers, the organization defines support functions like customer service, HR, Finance, Planning, IT, etc... Ethiopian airlines needs assurance that the functional units are also capable of delivering well optimized support to the overall success of attaining “Vision 2025” goals and objectives. The airlines’ corporate strategy has three levels, which are: corporate strategy, business strategy, and functional strategy. As corporate strategy, the airlines incorporate two major components in the strategic document. These are, fast and profitable growth and cost leadership in the main products with measured differentiation in the service delivery. Based on this, each of the business units defined their strategy taking in to account the corporate strategy. Similarly, the functional support units formulated their respective strategies that emanated from the corporate strategy.

As depicted in figure 12, Ethiopian airlines' enterprise strategy has three levels.

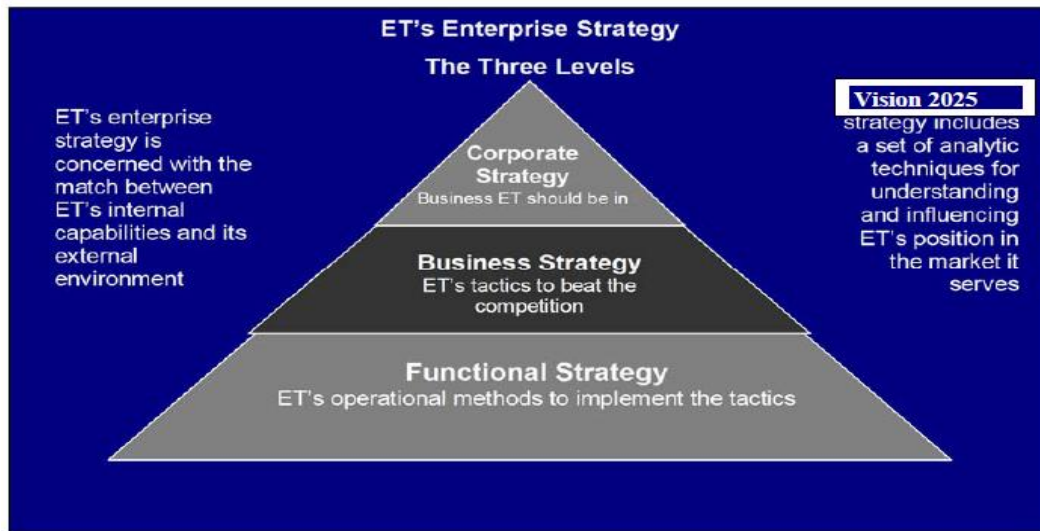


Figure 12: Enterprise Strategy levels (Source: Ethiopian airlines Vision 2020 and strategic document)

In IT strategic document, IT-business alignment is considered as a requirement to ensure the achievement of “Vision 2025” by leveraging IT. In this regard, the below quote was taken from the IT strategic and implementation plan:

“In order to meet Ethiopian Airlines Vision 2025 the revision of the corporate IT strategy with its execution plan is imperative. Accordingly, ET engaged in this major milestone of revising its corporate IT strategy to ensure its alignment with the vision 2025 and growth of the airline.

Basically, ICT’s role is very crucial in achieving the overarching business objective by understanding the need of the IT and aligning all IT investments with business strategic objectives.” (IT strategic and implementation plan pp 15, 2011)

In order to support the corporate vision, the planned IT infrastructural expansion is also considerate of the service it will provide. The following quote was taken from the IT strategic and implementation plan:

“...besides keeping the infrastructure available for the business, the department [IT department] will also be responsible for the safety of data and the continuous support to end users...”. (IT strategic and implementation plan pp 20, 2011)

In some of the IT departments, matrix form of organization is in place, in order to work closely with the Business units; which is believed to help in identifying and analyzing the underlying business processes, and maximize the utilization of the deployed automation systems and increase return on investment (ROI).

In a similar way Ethiopian airlines has also set the “*Advancement of Information Technology Infrastructure*” among the major Ethiopian airlines projects to be worked on in order to improve the IT function. Overall, the above are some of the indicators of the IT-business alignment as observed from the strategic vision of the business and that of IT.

On the contrary, the staffing approach of the IT division posits that, the human capital development and retention mechanisms needs to be calibrated to reflect the increased spectrum of skills required to develop and sustain the IT strategy. Such an approach may purely yield the IT staff who mainly specialize on the IT but may not fall in the overall business spectrum, unless backed by proper training and development programs. In line with this, the questionnaire finding also confirmed that skill construct has the least IT-business alignment maturity as compared to the other constructs as discussed in section 4.1.3.6. Hence, IT should define proper hiring and retaining mechanism by considering not only technical but also business knowledge of IT professionals.

It can be observed from the strategic documents of IT and the corporate strategy that, the link between the strategic visions set by Ethiopian airlines and the IT’s are apparently set in a concurrently way. i.e., IT is one of the functional units that support the attainment of the business and strategic level plan. Based on this, the IT strategy has been developed in line with the corporate strategy of the aviation group. However, IT-business alignment maturity model indicates that IT should be considered as one of the business units/ profit centers instead of functional/support unit so that it can be a source of competitive advantage and a major driver of the business value.

As the finding of the quantitative analysis revealed, Ethiopian airlines’ IT-business alignment maturity level is 2.92. This indicated that Ethiopian airlines is within the range of level 2 (committed process) with partial fulfillment of level 3 characteristics (Established Focused process). In this regard, Luftman’s (2012). IT-business alignment maturity model indicates that to progress from level 3 to level 4 in the maturity ladder, IT should be considered not only as business enabler but also as driver which helps to even change the business strategy based on the dynamic

innovative power of IT. Further, Luftnam (2012) asserted that, the role of IT should go beyond reducing cost and leveraging investments in order to ensure higher level of IT-business alignment maturity (Level 4 and 5). This can be seen from the strategy document that for the strategy of “Fast, Profitable and sustainable growth” the means is mentioned as:

“This being the usual practice, ET is ambitiously planning to achieve profitable and fast and sustainable growth over the next sixteen years. ET’s main reason is the tremendous opportunity which surrounds ET and ET is well positioned geographically to take advantage of the changing environment and resulting opportunities.” (IT strategic and implementation plan pp 13, 2011)

As can be seen the above quote IT is not even mentioned as a means of achieving the strategy of fast, profitable and sustainable growth. On the other hand, in the second strategy which is “The strategy of Cost Leadership” the document explicitly mentioned that the cost leadership can be achieved through:

“Investment in latest IT and best practice business process and systems” (IT strategic and implementation plan pp 13, 2011)

This indicated that IT is considered as a tool for reducing cost and leveraging investments. However, researches already revealed that, the higher level of maturity encompasses enhancing products and services, enhancing executive decision making, reaching the customer, enhancing partnership/ alliances and also supply-chain management (Dahalin et al., 2010; Dodani, 2008; Luftman, 2012). Hence, in order to improve the alignment to level 4 and further, the IT strategy should be revised by defining IT as a business unit/ profit center and also re-formulating the strategy in such a manner that IT is a business driver not only enabler. Accordingly, the business strategy should be revised to reflect same.

The other gap that is found is, lack of having organization wide Enterprise architecture. In line with this, IT strategy and implementation document clearly stipulated the demand of developing Enterprise Architecture which helps as an enterprise-wide approach for aligning IT strategy and implementation with corporate strategy. Further, Enterprise Architecture facilitates IT services work together properly and contribute to the realization of the strategic objectives.

The IT strategy document states that the Enterprise architecture is required to holistically address aligning IT with the business, facilitate decision making, seamless integration, and data sharing. Moreover, it is also mentioned that how it helps to improve data security, dependability, data integrity, consistency and reducing duplication. The demand, benefits and the issues that can be addressed by Enterprise Architecture is clearly stated in the document. However, Ethiopian airlines didn't have Enterprise Architecture yet. In line with this, scholars have empirically asserted that establishing Enterprise architecture has a positive and causal correlation with IT-business alignment maturity (Dahalin et al., 2010; Dodani, 2008). Hence, Ethiopian airlines should develop its Enterprise architecture which consists of business process architecture, application landscape architecture, Information architecture, and Infrastructure or Technology architecture.

The result of the document analysis revealed that the corporate business and IT strategy are formulated in aligned manner from the perspective of content, validity and completeness. However, as the finding of the quantitative analysis revealed that the implementation of the already formulated strategy has several limitations which can be seen from the overall maturity level which is 2.92 out of 5. Moreover, the role and benefit of IT should be escalated from reducing costs and leveraging investments to business driver which helps to enhance products and services, enhance executive decision making and also reach the customers. Besides this, Enterprise Architecture should be designed and implemented as already mentioned in the IT strategy document in order to ensure the enhancement of IT-business alignment.

CHAPTER SIX

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

This chapter presents conclusions, recommendations for practice and also future research based on the findings of the study drawn from the study.

6.1. Summary

In today's turbulent business environment such as the airline industry, the achievement and sustainability of IT-business alignment continues to be a major issue. This is due to the fact that the business environment is full of unpredictability arising from unanticipated changes in market demand and customers' preference, new technology developments and disruptive technological breakthroughs. While business is becoming unthinkable without leveraging IT, studies show that IT enables and drives business if it is aligned with business strategy.

Based on the preliminary assessment, it is noted that the management of IT-business alignment maturity practices are a gray area for Ethiopian airlines as there is no defined measurement metrics. Accordingly, this study is intended to measure the level of IT-business maturity of Ethiopian airlines. Moreover, this study assessed how IT strategy contributes towards successful implementation of business strategies and helps achieving business strategy.

In order to best answer the research questions and achieve the objective of the study, both quantitative and qualitative methods were employed. This approach is used in order to validate the findings of the quantitative analysis using the output of the qualitative study in the form of document analysis and vice versa.

In due course, extensive literature review was conducted to define a research model and SAM model which was designed by Luftman (2012) and adopted. According to Luftman (2012), the SAM model consists of six major constructs: communication, competency/ value measurement, governance, partnership, scope and architecture, and skills. It is attempted to enrich the research model by conducting an interview with 5 IT and business professionals who are experts in this

area. Based on the interview output, two additional constructs are identified. These are social alignment and IT investment. Social alignment found to be part of communication and partnership constructs which was already identified by Luftman (2012). Hence, social alignment is addressed with the existing model. IT investment is considered as an additional construct and incorporated in the existing model as mentioned in research model section. Accordingly, the data collection instrument was prepared based on the research model and incorporated in the standard questionnaire developed by Luftman (2012).

The questionnaire consists of 44 variables under the umbrella of the identified constructs. Moreover, document analysis has been conducted to get additional information of the aforementioned constructs. The utilization of both quantitative and qualitative approach helped to triangulate the findings and get better output.

In summary, by way of answering the research questions, the study has been able to: (1) measure IT-business alignment maturity level based on IT-business alignment maturity model (2) assess how IT strategy contributes towards successful implementation of business strategies and help achieving business strategy.

6.2. Conclusion

The overall IT-business alignment maturity of Ethiopian airlines is 2.92 which is within the range of level 2 (beginning/ committed process) with partial fulfillment of level 3 maturity (Established Focused process).

Based on the analysis and the findings, the following conclusions are drawn from the study:

The maturity of communication is found to be 2.78 which is categorized in level 2 forwarding to level 3. Based on this, the study revealed that IT managers have limited understanding of the business which inhibits IT division to talk the same language and communicate with the business. The business has little understanding of IT. several studies revealed that the business needs to have a clear understanding of IT in order to utilize an existing IT infrastructure and systems, properly communicate with IT to adopt new IT solutions based on the dynamic change of the competitive business world. Organizational learning occurs through ad-hoc and informal methods. The style and protocol of IT and business is found to be two-way, formal and inflexible. It is also found that proper and formal knowledge sharing is found to be in its infancy. Business transformation team

who are working as a bridge to liaison IT and business are in beginning stage and also they are not facilitating the relationship development between business and IT.

The maturity of value analytics construct is found to be 2.61 which is in level 2 (beginning/committed) process forwarding to level 3 (established/ focused) process. According to the finding of the study, the metrics and processes used to measure the contribution of IT are technical which consists of cost efficiency measure only with no formal feedback processes in place to review and take action based on the results of the measures. The study also revealed that IT and business metrics are not integrated each other. SLAs that exist between IT and functional units found to be primarily technically oriented such as response time, length of computer downtime, etc. It is found that external benchmarking is being performed occasionally and actions are taken rarely based on the finding of the benchmarking. The study disclosed that assessment and review of IT systems are emerging but is not being conducted regularly with formal processes. In relation to continuous improvement, the study found that Ethiopian airlines has few continuous improvement practices.

The maturity of IT governance construct is rated as 2.8 which is categorized in level 2 (beginning/committed) forwarding to level 3 (established/ focused) process. The study discovered that the business planning is occurring with slight IT participation. In the same manner, the document analysis also revealed that IT is being involved after the business strategy is set by the business c-level executives. With respect to IT steering committee, the study disclosed that the C-level IT and business executives are conducting IT projects related discussion informally as needed bases. With the same token, IT projects prioritization decision is found to be made by business only instead of mutual decision by the senior IT and business management members.

The maturity of IT governance construct is rated as 2.89 which is categorized in level 2 (beginning/committed) forwarding to level 3 (established/ focused) process. The study discovered that IT is being perceived as a fundamental enabler instead of driver of the business. In line with this, the role of IT in strategic planning is found to be a business process enabler. The study disclosed that, sharing of risks and rewards associated with IT-based initiatives are emerging. In relation to IT-business relationship management, the study disclosed that even though the organization defined programs to manage IT and business relationships, the business does not comply with them. With respect to business sponsors/ champions for IT-based initiatives, the study disclosed that the sponsorship occurs only at functional level only.

The maturity of IT scope & architecture construct is rated as 2.87 which is categorized in level 2 (beginning/committed) forwarding to level 3 (established/ focused) process. The study revealed that the primary IT systems of Ethiopian airlines are business process enablers rather than business strategy driver. Regarding the IT standards, the study shown that they are defined and enforced at the functional level with emerging coordination across functional units. In line with the scope of architectural integration, the study shown that the integration focused mainly functional units. The scope of IT infrastructure flexibility is being driven by the requirement of the current business strategy instead of proactive and dynamic change to accommodate the dynamicity of the business arena.

The IT strategy clearly depicts the need of human capital development and retention mechanisms to enhance the skills required for managing IT. On the contrary, the skills maturity revealed the least maturity level, which is 2.57, among all IT-business alignment maturity constructs. The innovative entrepreneurial environment is being encouraged at functional level only. The organization's readiness for change was gauged and the finding shown that change management unit is in place even though it lacks anticipating changes to proactively handle them. The study revealed that career cross-over is happening at functional units' level only. The IT division's ability to attract and retain the best professionals was assessed and the finding revealed that IT is hiring focused on technical expertise rather than considering both technical and business expertise. The study has shown that inter-personal interactions are emerging between IT and business.

The maturity of IT investment is found to be 3.02 which is in level 3 (established/ focused) process. IT investment decisions are being made primarily considering as a process enabler. This finding is in agreement with the findings of partnership and IT governance constructs. The study revealed that IT budgeting is viewed as a cost center with some projects treated as investments. This can also be asserted from the corporate business strategy document, that IT is structure as one of support functional unit instead of a business unit/ profit center with its own profit and loss statements. The sufficiency of IT capital budget was assessed and it is found that the budget needs further improvement in order to handle business driving projects. Further, the PCA result revealed IT-business alignment maturity determinants in a ranked manner; which helps to prioritize and address the issues based on their total contribution share.

- IT governance explained 31.85% of the total variation of IT-business alignment maturity. This indicates the essentiality of proper IT strategic planning, business strategic planning, the role of IT in strategic planning, program management, establishing appropriate steering committee, and setting proper locus of power for business realization through IT. Hence, it is concluded that IT governance issues are affecting IT-business alignment maturity in Ethiopian Airlines.
- As PCA revealed, 8.3% of the total variation of IT-business alignment is explained by IT-investment construct. Thus, the study identified IT investment as the second most important determinant of IT-business alignment maturity.
- Value analytics is ranked the third determinant construct of IT-business alignment maturity, which explains 5.78% of the total variance.

The study incorporated qualitative data in the form of document analysis. Based on this, the analysis revealed that the business strategy defines IT as one of the support functional units instead of a business unit/ profit center with its own profit and loss statements. Due to this, the role of IT is limited in cost saving and business process enabling instead of driving the business strategy and help the organization as a competitive advantage and ultimately generating business value. Based on the document analysis, Ethiopian airlines was planning to formulate and utilize Enterprise architecture in order to ensure IT-business alignment. However, the organization didn't realize and use Enterprise architecture yet.

6.2. Recommendations

Based on the findings of this study and the conclusions drawn, the following recommendations are forwarded for practice and knowledge (further research).

6.2.1 Recommendation for Practice

The result of this study is believed to provide guidance to managers, IT professionals and consultants concerning the core activities which can influence positively the maturity of IT-business alignment and realize the intended business benefits. In line with this, the following recommendations are forwarded based on the research findings in order to enhance the IT-business alignment maturity to level 4:

- The role of IT the role of IT should go beyond reducing cost and leveraging investments in order to ensure higher level of IT-business alignment maturity, the higher level of maturity encompasses enhancing products and services, enhancing executive decision making, reaching the customer, enhancing partnership/ alliances and also supply-chain management. Hence, in order to improve the alignment to level 4, the IT strategy should be revised by defining IT as a business unit/ profit center and also re-formulating the strategy in such a manner that IT is a business driver not only enabler. Accordingly, the business strategy should be revised to reflect same.
- Enterprise architecture should be designed and implemented which consists of business process architecture, application landscape architecture, Information architecture, and Infrastructure or Technology architecture in order to ensure IT-business alignment of the organization.
- The style and protocol of communication should progress towards two-way, informal and flexible in order to facilitate smooth communication. There should also be formal sharing of knowledge at the functional unit level, corporate level, and with business partners/ alliances which can be considered as one of the initiatives among others, to improve IT-business alignment. Since the airline industry operates in a highly turbulent and dynamic environment, ensuring ongoing knowledge sharing across the organization is paramount. Moreover, the business transformation should regularly liaison and facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT with the primary objective of facilitating relationship development across the organization and external partners.
- IT should demonstrate its value to the business in terms that the business understands which indicates having integrated IT and business metrics to measure the contribution of IT to the business. SLAs should be expressed in terms that the business understands and accepts. Moreover, SLAs need to show the related rewards and penalties for surpassing or missing the defined objectives. Hence, SLAs have to be redefined in Ethiopian airlines in such a way that the business understands and accepts. Moreover, Ethiopian airlines should make regular and formal benchmarking in place and have regulated process to take action and measure the changes based on the findings. In relation to assessments and review of IT systems, there should be a formal process to conduct regular assessment in order to ensure

continuous improvement of the organization. Moreover, a formal process should be in place to make changes based on the finding of the assessments and measure changes.

- In order to improve IT governance, there should be formal and regular committee meetings with demonstrated effectiveness in order to increase the success rate of IT related projects which ultimately improve organizations' IT-business alignment maturity. IT related projects prioritizations is one of the improvement area which should be handled mutually by the business and IT top level management members with consideration of the priorities of business partners/ alliances in order to choose impacting projects that help to achieve the strategic goals of the business. There should also be an integrated enterprise-wide strategic business plan for IT with the purpose of facilitating clear understanding of the business so that IT can enable and further drive business processes and strategies in order to achieve better business values.
- IT should be perceived as a fundamental driver of future business activity in order to ensure better maturity of IT-business alignment. This indicates that IT can bring new ways of doing business, process and deliver products and services, communicate with customers and also compete in the business arena. Besides IT should be perceived as a partner with the business to drive strategic business objective and also brining value to the firm. SLAs should be defined between IT and business which clearly show the risks, rewards and penalties for surpassing or missing the defined objectives, key performance indicators and balanced score cards. Moreover, corporate of CEO level business sponsorship/ championship should be ensured so that IT based projects success can be maximized.
- The scope of IT should be upgraded to a driver of business process in particular and strategy in general. In view of enhancing scope & architecture, IT standards should be defined and enforced across the organization and also with joint coordination among strategic business partners and alliances. The pervasiveness of infrastructure transparency and flexibility should be ensured to leverage IT assets on an enterprise-wide basis. Hence, the infrastructure of Ethiopian airlines should be enhanced in such a way that it reflects flexibility to handle anticipated and also unanticipated business environment changes. Moreover, it helps to extend the reach of the organization into supply chains of customers, suppliers and business partners/ alliances.

- Ethiopian airlines should encourage employees to boost entrepreneurship spirit and leveraging innovative ideas at corporate level and also with business partners/ alliances. The existing business transformation team needs further improvement to properly handle changes across the organization and also anticipate changes to proactively handle them. In relation to creating capable IT team, effective programs should be in place in order to attract and retain best IT professionals with both IT and business skills.

6.2.2 Future research

As part of further future researches, the following are the researcher's suggestions for knowledge.

- **Enhancing the IT-business alignment maturity model**
Further study can be conducted to identify additional constructs that determine the IT-business alignment maturity by having multiple sectors and organizations.
- **Enhancing Survey instrument**
Further study can be conducted to enhance the survey instrument and re-conduct an empirical study since the instrument exhibited lack of internal consistency in communication and scope & architecture constructs' survey items.
- **Impact Assessment Study**
The impact assessment can be conducted in order to assess the consequences of the recommended solutions with respect to its contribution on the overall improvement of IT-business alignment maturity.
- **The impact of IT-Business Alignment on Organization's Performance**
Further study can be conducted on analyzing the impact of IT-business alignment on organization's performance.

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APPENDICES

Appendix A: Letter of Request

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Addis Ababa University
College of Business & Economics
Master of Business Administration

Ref. No: CBE/MBA/2017/18/002
Date: 14/11/2018

To Ethiopian Airlines

Student Elsa Taddete Haiu, is undertaking project entitle, "IT-Business
Alignment: The case of Ethiopian Airlines"


She/He is taking this opportunity of project study in partial fulfillment of MBA master in Finance /Management.

We believe that the result of the project would have practical application and be of value to you, to us and to the business community at large. Hence we would be very grateful if your organization could support us in this endeavor.


Besides, we promise you that data will be kept confidential and used for academic purposes only. Further, we can send to you all the summary results and findings, when the undertaking is completed.

Thank you for the anticipated cooperation.

With Best Regards,



Tadesse Lemesa
Coordinator, MBA Program
College of Business and Economic
Addis Ababa University



16/11/18
Mgr HRD & PMS

☎ 251-011-1-22-96-91 ✉ 5563

Appendix B: Questionnaire Survey

Addis Ababa University
College of Business & Economics
Department of Management
MBA Program

Dear Sir/ Madam:

In partial fulfillment of the requirements for the Degree of Master of Business Administration (MBA), I am undertaking a research on “IT-Business Alignment: The Case of Ethiopian Airlines” at Addis Ababa University. I have accordingly prepared this survey questionnaire. The objective of the survey is, to assess the maturity of IT-business alignment with respect to communication, competency/value measurement, governance, partnership, scope & architecture, skills, and IT-investment which helps to provide Ethiopian Airlines with specific insights in order to create a roadmap to improve the maturity level and thereby improving IT-Business strategic alignment.

This research is believed to produce results that make IT a recognized enabler and also driver of business value in Ethiopian Airlines and other firms as well.

Your honest responses to each of the questions and statement are extremely valuable to the outcome of this research. The questionnaire survey will take approximately 30 minutes to complete and the results of the survey will be used for the purpose of academic research only. Hence, all responses will be kept in strict confidentiality and hence would not affect any one in any case.

Your dedication is most valued and appreciated and I would like to take this opportunity to thank you in advance for your kind participation, genuine and on time response to the questionnaire.

Thank you again!

Elsa Taddele

Please write the IT systems that you frequently use for your tasks and activities on your current position.

General Instructions

1. Please answer this questionnaire consistently with respect to the department which you are most familiar with and that you know the best. Kindly base your answers on the current status and not on anticipated future results.
2. Please tick on the appropriate responses to the questions.

A. Effectiveness of IT and Business Communications

1. To what extent does IT understand the organization's business environment (eg. Its customers, Competitors, processes, partners/ alliances):
 - a. Senior and mid-level IT managers do not understand the business.
 - b. Senior and mid-level IT managers have limited understanding of the business.
 - c. Senior and mid-level IT managers have a good understanding of the business.
 - d. Understanding of the business by all IT members is encouraged and promoted by senior managers.
 - e. Understanding of the business is required (e.g., tied to performance appraisals) throughout the IT function.

 2. To what extent do the business understand the IT environment (e.g., its current and potential capabilities, systems, services, processes):
 - a. Senior and mid-level business managers do not understand IT.
 - b. Senior and mid-level business managers have a little understanding of IT.
 - c. Senior and mid-level business managers have a good understanding of IT.
 - d. Understanding of IT by all employees is encouraged and promoted by senior management.
 - e. Understanding of IT is required (e.g., tied to performance appraisals) throughout the business.

 3. The methods that are in place to promote organizational learning such as (experiences sharing, problems solving mechanisms, objectives, critical success factors) occurs primarily through:
 - a. Ad-hoc methods through employee observation and informal sharing.
 - b. Informal methods through newsletters, bulletin and board notices.
 - c. Regular and clear methods such as training, e-mail, portal, and meetings from management.
 - d. Formal, unifying, bonding methods from senior *and* mid-level management.
 - e. Formal, unifying, bonding methods from senior and mid-level management, *with feedback* measures to monitor and promote effectiveness of learning.

 4. The style and protocol of IT and business communication is:
 - a. One-way, from the business; formal and inflexible.
 - b. One-way, from the business; moderately informal and moderately flexible.
 - c. Two-way, formal and inflexible.
 - d. Two-way, moderately informal and moderately flexible.
 - e. Two-way, informal and flexible.
-

5. The following statements pertain to the extent in which there is knowledge sharing (intellectual understanding and appreciation of the problems/opportunities, tasks, roles, objectives, priorities, goals, direction, etc.) between IT and business:
- a. Knowledge sharing is on an ad-hoc basis.
 - b. Knowledge sharing is somewhat structured and/or structure is beginning to be created.
 - c. There is structured sharing around key functional unit processes.
 - d. There is formal sharing at the functional unit level and at the corporate level.
 - e. There is formal sharing at the functional unit level, at the corporate level, and with business partners/alliances.
6. The following statements pertain to the role and effectiveness of IT and business liaisons (Business Transformation):
- a. We do not use liaisons, or if we do, we do so on an ad-hoc, as needed basis.
 - b. We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They are the primary contact point for interactions between IT and the business. However, they are not being used to facilitate relationship development.
 - c. We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They occasionally facilitate relationship development.
 - d. We regularly use liaisons to facilitate the transfer of IT knowledge to the business and business knowledge to IT. Their primary objective is to facilitate internal relationship development.
 - e. We regularly use liaisons to facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT. Their primary objective is to facilitate relationship development across the business and its external partners.

B. Measurement of the Competency and Value of IT

7. The following statements pertain to the metrics and processes used to measure IT's contribution to the business:
- a. The metrics and processes we have in place to measure IT are primarily technical (e.g., system availability, response time).
 - b. We are equally concerned with technical and cost efficiency measures. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
 - c. We formally assess technical and cost efficiency using traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC).
 - d. In addition to the above, cost effectiveness is measured and also we have formal feedback processes in place to review and take action based on the results of our measures.
 - e. We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors and customers).

8. The following statements pertain to the use of business metrics to measure contribution to the business:

- a. We do not measure the value of our business investments, or do so on an ad-hoc basis.
- b. We are concerned with cost efficiency measures at the functional organization level only. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
- c. We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organizations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures.
- d. We formally measure value based on the contribution to our customers. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organizations.
- e. We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

9. The following statements pertain to the use of integrated IT and business metrics to measure ITs contribution to the business:

- a. We do not measure the value of our IT business investments, or do so on an ad-hoc basis.
- b. The value measurements for IT and business are not linked. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.
- c. The value measurements for IT and business are starting to be linked and formalized. We are also starting to have formal feedback processes in place to review and take action based on the results of our measures.
- d. We formally link the value measurements of IT and business. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organizations.
- e. We use a multi-dimensional approach with appropriate weight given to IT and business measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors and customers).

10. The following statements pertain to the use of service level agreements (SLAs):

- a. We do not use SLAs or do so sporadically.
 - b. We have SLAs which are primarily technically oriented (response time, length of computer downtime, etc.), between the IT and functional units/ organizations.
 - c. We have SLAs which are both technically oriented and relationship-oriented (user/customer satisfaction, IT's commitment to the business, etc.) that are between the IT and functional organizations.
 - d. We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional units/ organizations as well as enterprise wide.
 - e. We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organizations as well as at enterprise wide and also with our external partners/alliances.
-

11. The following statements pertain to benchmarking practices. Informal practices are such things as informal interviews, literature searches, company visits, etc., while formal practices are such things as environmental scanning, data gathering and analysis, determining best practices, etc.:

- a. We seldom or never perform either informal or formal benchmarks.
- b. We occasionally or routinely perform informal benchmarks.
- c. We occasionally perform formal benchmarks and seldom take action based on the findings
- d. We routinely perform formal benchmarks and usually take action based on the findings.
- e. We routinely perform formal benchmarks and have a regulated process in place to take action and measure the changes.

12. The following statements pertain to the extent of assessment and review of IT systems:

- a. We do not formally assess and/or review.
- b. We assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss).
- c. Assessments and/or reviews are becoming routine occurrences.
- d. We routinely assess and/or review and have a formal process in place to make changes based on the results.
- e. We routinely assess and/or review and have a formal process in place to make changes based on the results and measure the changes. Our external partners are included in the process.

13. The following statements pertain to the extent to which IT-business continuous improvement practices (e.g., quality circles, quality reviews) and effectiveness measures are in place:

- a. We do not have any continuous improvement practices in place.
- b. We have a few continuous improvement practices in place, but no effectiveness measures are in place.
- c. We have a few continuous improvement practices in place and the use of effectiveness measures is emerging.
- d. We have many continuous improvement practices in place and we frequently measure their effectiveness.
- e. We have well established continuous improvement practices and effectiveness measures in place.

14. The demonstrated contribution that the IT function has made to the accomplishment of the organization's strategic goals is:

- a. Very weak.
- b. Somewhat weak.
- c. Neither weak nor strong.
- d. Somewhat strong.
- e. Very strong.

C. Governance

15. The following statements pertain to strategic business planning with IT participation:

- a. We do no formal strategic business planning or, if it is done, it is done on an as-needed basis.
- b. We do formal strategic business planning at the functional unit level with slight IT participation.
- c. We do formal strategic business planning at the functional unit levels with some IT participation. There is some inter-organizational planning.
- d. We do formal strategic business planning at the functional unit and across the enterprise with IT participation.
- e. We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances with IT participation.

16. The following statements pertain to strategic IT planning with business participation:

- a. We do no formal strategic IT planning or, if it is done, it is done on an as-needed basis.
- b. We do formal strategic IT planning at the functional unit level with slight business participation.
- c. We do formal strategic IT planning at the functional unit levels with some business participation. There is some inter-organizational planning.
- d. We do formal strategic IT planning at the functional unit and across the enterprise with the business.
- e. We do formal strategic IT planning at the functional unit, across the enterprise, and with our business partners/alliances.

17. The following statements pertain to IT steering committee(s) with senior level IT and business management participation:

- a. We do not have formal/regular steering committee(s).
- b. We have committee(s) which meet informally on an as-needed basis.
- c. We have formal committees, which meet regularly and have emerging effectiveness.
- d. We have formal, regular committee meetings with demonstrated effectiveness.
- e. We have formal, regular committee meetings with demonstrated effectiveness that include strategic business partners sharing decision-making responsibilities.

18. The following statements pertain to how IT projects are prioritized. Our IT project prioritization process is usually:

- a. In reaction to a business or IT need.
- b. Determined by the IT function.
- c. Determined by the business function.
- d. Mutually determined between senior and mid-level IT and business management.
- e. Mutually determined between senior and mid-level IT and business management and with consideration of the priorities of any business partners/alliances.

19. The ability of the IT function to react/respond quickly to the organization's changing business needs is:

- a. Very weak.
- b. Somewhat weak
- c. Neither weak nor strong.
- d. Somewhat strong.
- e. Very strong.

D. PARTNERSHIPS BETWEEN IT AND BUSINESS FUNCTIONS

20. IT is perceived by the business as:

- a. A cost of doing business.
- b. Emerging as an asset.
- c. A fundamental enabler of future business activity.
- d. A fundamental driver of future business activity.
- e. A partner with the business that co-adapts/improvises in bringing value to the firm.

21. The following statements pertain to the role of IT in strategic business planning:

- a. IT does not have a role.
- b. IT is used to enable business processes.
- c. IT is used to drive business processes.
- d. IT is used to enable or drive business strategy.
- e. IT co-adapts with the business to enable/drive strategic objectives.

22. The following statements pertain to the sharing (by IT and business management) of the risks and rewards (e.g., bonuses) associated with IT-based initiatives (i.e., a project is late and over budget because of business requirement changes):

- a. IT takes all the risks and does not receive any of the rewards.
- b. IT takes most of the risks with little reward.
- c. Sharing of risks and rewards is emerging.
- d. Risks and rewards are always shared.
- e. Risks and rewards are always shared and we have formal compensation and reward systems in place that induce managers to take risks.

23. The following statements pertain to formally managing the IT/business relationship. To what extent are there formal processes in place that focus on enhancing the partnership relationships that exist between IT and business (e.g., cross-functional teams, training, risk/reward sharing):

- a. We don't manage our relationships.
- b. We manage our relationships on an ad-hoc basis.
- c. We have defined programs to manage our relationships, but IT or the business does not always comply with them. Conflict is seen as creative rather than disruptive.
- d. We have defined programs to manage our relationships and both IT and the business comply with them.
- e. We have defined programs to manage our relationships, both IT and the business comply with them, and we are continuously improving them.

24. The following statements pertain to IT and business relationship and trust:

- a. There is a sense of conflict and mistrust between IT and the business.
- b. The association is primarily an "arm's length" (no close relationship) transactional style of relationship.
- c. IT is emerging as a valued service provider.
- d. The association is primarily a long-term partnership style of relationship.
- e. The association is a long-term partnership and valued service provider

25. The following statements pertain to business sponsors/champions. Our IT-based initiatives:

- a. Do not usually have a senior level IT or business sponsor/champion.
- b. Often have a senior level IT sponsor/champion only.
- c. Often have a senior level IT and business sponsor/champion at the functional unit level.
- d. Often have a senior level IT and business sponsor/champion at the corporate level.
- e. Often have a senior level IT and the CEO as the business/sponsor champion.

E. SCOPE AND ARCHITECTURE OF THE IT INFRASTRUCTURE

26. The following statements pertain to the scope of IT systems. Our primary systems are:

- a. Traditional office support (e.g., e-mail, accounting, word processing, legacy systems).
- b. Transaction-oriented (e.g., back office support).
- c. Business process enablers (IT supports business process change).
- d. Business process drivers (IT is a catalyst for business process change).
- e. Business strategy enablers/drivers (IT is a catalyst for changes in the business strategy).

27. The following statements pertain to the articulation of and compliance with IT standards. Our IT standards are:

- a. Non-existent or not enforced.
- b. Defined and enforced at the functional unit level but not across different functional units.
- c. Defined and enforced at the functional unit level with emerging coordination across functional units.
- d. Defined and enforced across functional units.
- e. Defined and enforced across functional units, and with joint coordination among our strategic business partners/alliances.

28. The following statements pertain to the scope of architectural integration. The components of our IT infrastructure are:

- a. Not well integrated.
- b. Integrated at the functional unit with emerging integration across functional units.
- c. Integrated across functional units.
- d. Integrated across functional units and our strategic business partners/alliances.
- e. Evolving with our business partners.

29. The following statements pertain to the level of disruption caused by business and IT changes (e.g., implementation of a new technology, business process, and merger/acquisition). Most of the time, a business or IT change is:

- a. Not readily transparent.
- b. Transparent at the functional level only.
- c. Transparent at the functional level and emerging across all locations.
- d. Transparent across the entire organization.
- e. Transparent across the organization and to our business partners/alliances.

30. The following statements pertain to the scope of IT infrastructure flexibility to business and technology changes. Our IT infrastructure is viewed as:

- a. A utility providing the basic IT services at minimum cost.
- b. Emerging as driven by the requirements of the current business strategy.
- c. Driven by the requirements of the current business strategy.
- d. Emerging as a resource to enable fast response to changes in the marketplace.
- e. A resource to enable and drive fast response to changes in the marketplace.

F. HUMAN RESOURCE SKILLS

31. The following statement pertain to the extent the organization fosters an innovative entrepreneurial environment. Entrepreneurship is:

- a. Discouraged.
- b. Moderately encouraged at the functional unit level.
- c. Strongly encouraged at the functional unit level.
- d. Strongly encouraged at the functional unit and corporate levels.
- e. Strongly encouraged at the functional unit, corporate level, and with business partners/alliances.

32. The following statements pertain to the cultural locus of power in making IT-based decisions. Our important IT decisions are made by:

- a. Top business management or IT management at the corporate level only.
- b. Top business or IT management at corporate level with emerging functional unit level influence.
- c. Top business management at corporate and functional unit levels, with emerging shared influence from IT management.
- d. Top management (business and IT) across the organization and emerging influence from our partners/alliances.
- e. Top management across the organization with equal influence from our business partners/alliances.

33. The following statements pertain to the organization's readiness for change:

- a. We tend to resist change.
- b. We recognize the need for change and change readiness programs are emerging.
- c. Change readiness programs providing training and necessary skills to implement change are in place at the functional unit level.
- d. Change readiness programs are in place at the corporate level.
- e. Change readiness programs are in place at the corporate level and we are proactive and anticipate change.

34. The following statements pertain to career crossover opportunities among IT and business personnel:

- a. Job transfers rarely or never occur.
- b. Job transfers occasionally occur within the functional units.
- c. Job transfers regularly occur for management level positions usually at the functional level.
- d. Job transfers regularly occur for all position levels and within the functional units.
- e. Job transfers regularly occur for all position levels, within the functional units, and at the corporate level.

-
35. The following statements pertain to the IT division's ability to attract and retain the best business and technical professionals:
- A. There is no formal program to retain IT professionals. Recruiting demands are filled ineffectively.
 - B. IT hiring is focused on technical expertise.
 - C. IT hiring is focused equally on technical and business expertise. Retention programs are in place.
 - D. Formal programs are in place to attract and retain the best IT professionals with both technical and business skills.
 - E. Effective programs are in place to attract and retain the best IT professionals with both technical and business skills.

36. The following statements pertain to employee opportunities to learn about and support services outside the employee's functional unit (e.g., programmers trained in product/service production functions, customer service trained in systems analysis) using programs such as cross training and job rotation. The organization:
- A. Does not provide opportunities to learn about support services outside the employee's functional unit.
 - B. Opportunities are dependent on the functional unit.
 - C. Formal programs are practiced by all functional units.
 - D. Formal programs are practiced by all functional units and across the enterprise.
 - E. Opportunities are formally available across the enterprise and with business partners/alliances.

37. The following statements pertain to the interpersonal interaction (e.g., trust, confidence, cultural, social, and political environment) that exists across IT and business units in our organization:
- A. There is minimum interaction between IT and business units.
 - B. The association is primarily an "arm's length" (no close relationship) transactional style of relationship.
 - C. Trust and confidence among IT and business is emerging.
 - D. Trust and confidence among IT and business is achieved.
 - E. Trust and confidence is extended to external customers and partners.

G. IT INVESTMENT

38. Our IT investment decisions are primarily based on IT's ability to:
- A. Reduce costs.
 - B. Increase productivity and efficiency as the focus.
 - C. IT is seen as a process enabler.
 - D. Business effectiveness is the focus. IT is seen as a process driver or business strategy enabler.
 - E. Create competitive advantage and increase profit. Our business partners see value.

39. The following statements pertain to IT budgeting. Our IT function is budgeted as a:

- A. Cost center, with erratic/inconsistent/irregular/changeable spending.
- B. Cost center, by functional units.
- C. Cost center with some projects treated as investments.
- D. Investment center.
- E. Profit center, where IT generates revenues.

40. The capital budget allocated for IT is sufficient to invest on programs and projects that assist realizing strategic business objectives and goals:

- A. Strongly disagree.
- B. Disagree.
- C. Moderately agree.
- D. Agree.
- E. Strongly agree.

41. The IT investment support and enable the business which drives the organization's performance:

- A. Strongly disagree.
- B. Disagree.
- C. Moderately agree.
- D. Agree.
- E. Strongly agree.

42. IT investments are helping to create, maintain and improve IT capabilities necessary to establish alignment:

- A. Strongly disagree.
- B. Disagree.
- C. Moderately agree.
- D. Agree.
- E. Strongly agree.

43. The IT resources are being invested for the projects that help to achieve strategic business goal:

- A. Strongly disagree.
- B. Disagree.
- C. Moderately agree.
- D. Agree.
- E. Strongly agree.

44. Overall, how do you rate IT-business alignment maturity of Ethiopian airlines?

- A. Very Low.
- B. Low.
- C. Average.
- D. High.
- E. Very High.

Demographic Information

1. Name (Optional): _____

2. Your Division resides in: IT Business

3. Department/ Section: _____

4. Which of the following best represents your current position in Ethiopian Airlines?

_____ Non-Management _____ Team Lead

_____ Unit Leader _____ Manager

_____ Head _____ Director

_____ Senior Management

5. Please indicate your seniority/ Service year in Ethiopian Airlines

_____ < 2 years _____ 2-5 years

_____ 6-10 years _____ 11-15 years

_____ > 15 years

Appendix C: Interview Outline Coddling

1. Would you please explain what we mean IT-business alignment?
2. In your evaluation how do you see the IT-business alignment in Ethiopian airlines?
3. In scientific literature, IT-business alignment is assessed by communication, competency/ values measurement, IT- governance, partnership, scope & architecture, and skills constructs. Would you please give your suggestion on this constructs?
4. In addition to the discussed dimensions of IT-business alignment, what additional construct do you propose that best determine the maturity of IT-business alignment?

Appendix D: List of IT and business related activities Coding

The following is a list of IT and business related activities (the codes are later used in the construct analysis):

Code of the Item	Item Description
C1	Understanding of Business by IT
C2	Understanding of IT by Business
C3	Inter-organizational Learning/Education
C4	Protocol Rigidity
C5	Knowledge Sharing
C6	Liaison (Business Transformation) Effectiveness
M1	IT metrics
M2	Business Metrics
M3	Integrated IT and Business metrics
M4	Service Level Agreements
M5	External Benchmarking
M6	Formal Assessments/Reviews
M7	Continuous Improvement
M8	IT function contribution
G1	Business Strategic Planning
G2	IT Strategic Planning
G3	Steering committee
G4	IT Prioritization Process
G5	IT Reaction Capacity
P1	Business Perception of IT Value
P2	Role of IT in Strategic Business Planning
P3	Shared Goals, Risk, Rewards/Penalties
P4	Program Management
P5	Relationship/ Trust Style
P6	Business Sponsor/Champion
A1	Traditional, Enabler/Driver, External
A2	Standards Articulation
A3	Architectural Integration
A4	Architectural Transparency to Changes
A5	IT infrastructure flexibility
S1	Innovative Entrepreneurial Environment
S2	Cultural Locus of Power
S3	Change Readiness
S4	Career Crossover
S5	Hiring and Retaining
S6	Training/Talent improvement to Learn
S7	Interpersonal Interaction

I1	IT Investment Decisions
I2	IT Budgeting
I3	Budget Sufficiency
I4	IT investment proper utilization
I5	IT investment ability to improve IT capabilities
I6	IT investment and projects effectiveness
AL	IT-business alignment (Overall)

Source: Partially adopted from Luftman (2016) and partially developed by the researcher (2018)

Appendix E: Sample Size Calculation

$$n_0 = \frac{(Z_{\alpha/2})^2 pq}{e^2}$$

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}}$$

Where, N = Target Population

n_0 = Sample size

n = Calculated/Actual sample size

e = the desired level of precision, (taken confidence level = 95% where by $\alpha = 0.05$)

P = is estimated proportion of an attribute in the population (taken as 0.5 and q = 1-P = 0.5; for conservative estimate)

Z = normal curve that cuts an area α (the value read from statistical table)

N = 742

IT (Both Management & Non-management) = 235

Business (Only Management) = 507

$\alpha = 0.05$ $Z_{\alpha/2} = 1.96$

$e^2 = 0.0025$

$$n_0 = \frac{(1.96)^2 * 0.5 * (0.5)}{0.0025}$$

$$n_0 = 384.16$$

$$n = \frac{384.16}{1 + \frac{384.16 - 1}{742}}$$

$$n = \underline{\underline{254}}$$

N total = 742

n total = 254

Total #	IT	Business
N	235	507
n	79	175
K = (N/n)	3	3

Randomly picked 3rd

Sampled every 3rd

DECLARATION

I declare that the thesis is my original work and has not been presented for a degree in any other university.

Date

This thesis has been submitted for examination with my approval as university advisor.

Advisor