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Business-IT Alignment in Higher Education Institutions: United Arab Emirates University Case Study

Nayla Salem Ali Al khateri

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BUSINESS-IT ALIGNMENT IN HIGHER EDUCATION INSTITUTIONS: UNITED ARAB EMIRATES UNIVERSITY CASE STUDY

Nayla Salem Mohammed Ali Al khateri

This thesis is submitted in partial fulfilment of the requirements for the degree of Master of Science in Information Technology Management

Under the Supervision of Dr. Farag Sallabi

November 2017
Declaration of Original Work

I, Nayla Salem Mohammed Ali Al khateri, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this thesis entitled "Business-IT Alignment in Higher Education Institutions: United Arab Emirates University Case Study", hereby, solemnly declare that this thesis is my own original research work that has been done and prepared by me under the supervision of Dr. Farag Sallabi, in the College of Information Technology at UAEU. This work has not previously been presented or published, or formed the basis for the award of any academic degree, diploma or a similar title at this or any other university. Any materials borrowed from other sources (whether published or unpublished) and relied upon or included in my thesis have been properly cited and acknowledged in accordance with appropriate academic conventions. I further declare that there is no potential conflict of interest with respect to the research, data collection, authorship, presentation and/or publication of this thesis.

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Abstract

This thesis addresses the importance of Business-IT alignment in higher education institutions. Business-IT alignment is defined as applying IT in a suitable and timely manner, in harmony with business strategies, goals and needs. Business-IT alignment is an ultimate goal of governmental and non-governmental organizations that requires close attention and continuous monitoring. UAE university has a well-defined business strategy augmented with a well-defined IT strategy. So, to get the most benefits of acquiring and using IT in the university, the IT need to be aligned with the core business and the supporting services. The main objective of this thesis is to review the literature concerning the Business–IT alignment topic with focus on higher education institutions and explore different Business–IT alignment frameworks. Also, to define the as-is enterprise architecture of the UAEU using SAMM (Strategic Alignment Maturity Model) by Luftman. This model is used to measure the Business-IT Alignment level of the university. The Business-IT alignment of the as-is architecture will be assessed then the assessment results will be analyzed and draw conclusions. Also, suggestions for improvements are put forward, based on the results. Finally, in the last chapter, implications and limitations of this thesis are discussed and suggestions for other and/or further research are made.

**Keywords:** Business-IT Alignment, Assessment Model, Strategic alignment, Strategic Alignment Maturity model, SAMM.
مواءمة قطاع الأعمال وتقنية المعلومات في مؤسسات التعليم العالي دراسة حالة: جامعة الإمارات العربية المتحدة

المملوء

تختص هذه الأطروحة بأهمية قضية المواءمة بين الأعمال وتقنية المعلومات. وتعلن أنها تطبيق تقنية المعلومات بطريقة مناسبة وفي الوقت المناسب، وفي توافق مع استراتيجيات وأهداف واحتياجات الأعمال. وتعتبر المواءمة بين الأعمال وتقنية المعلومات هدف رئيسي للمنظمات الحكومية وغير الحكومية التي تتطلب الاهتمام الوثيق والمراقبة المستمرة لدى جامعات الإمارات العربية المتحدة استراتيجية واضحة ومهددة ومحببة مع استراتيجية تقنية المعلومات، لذلك والحصول على أكبر قدر من الفائدة من استخدام تقنية المعلومات في الجامعة، يجب أن تكون هناك موافقة بين تقنية المعلومات مع الأعمال الرئيسية والخدمات المساعدة.

إن الهدف الرئيسي من هذه الأطروحة هو مراجعة الدراسات المتعلقة بموضوع موافقة الأعمال وتقنية المعلومات، واستكشاف مختلف النماذج المطروحة من قبل هذه الدراسات. وبالإضافة إلى ذلك، استخدم نموذج لوفتمان (SAMM) لدراسة حالة بنية جامعة الإمارات العربية المتحدة الحالية، حيث تم استخدام هذا النموذج لقياس مستوى الموافقة بين قطاع الأعمال وتقنية المعلومات في الجامعة وتقييم حالة البنية في الوقت الحاضر، ومن ثم تم تحليل البيانات واستخلاص النتائج. واستنادا على هذا النتائج، تم تقديم الاقتراحات المناسبة للتطوير والتحسين في الموافقة.

وفي النهاية والأخير، تم مناقشة المشاكل والقيود لهذه الدراسة وتقديم المقترحات للبحث المستقبلية، وأخيرا وفي نهاية هذا الرسالة تم إضافة الملحق الذي يحتوي على أسئلة الاستبيان ونتائج المستخدمة لدراسة الموافقة بين الأعمال وتقنية المعلومات في جامعة الإمارات.

مفهوم البحث الرئيسي: موافقة الأعمال وتقنية المعلومات، الموافقة الاستراتيجية، نموذج المحاذا الاستراتيجية.
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Dedication

To my beloved parents and family
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<td>BITA</td>
<td>Business-IT Alignment</td>
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<tr>
<td>C</td>
<td>Communication</td>
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<tr>
<td>COBIT</td>
<td>Control Objectives for Information and Related Technology</td>
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<td>DOIT</td>
<td>Division of Information Technology</td>
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<td>G</td>
<td>Governance</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>ITG</td>
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<td>ITIL</td>
<td>Information Technology Infrastructure Library</td>
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<td>SA</td>
<td>Scope &amp; Architecture</td>
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<td>SAMM</td>
<td>Strategic Alignment Maturity Model</td>
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<td>TOGAF</td>
<td>The Open Group Architecture Framework</td>
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<td>UAEU</td>
<td>United Arab Emirates University</td>
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<td>VM</td>
<td>Value Measurement</td>
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Chapter 1: Introduction

1.1 Overview

Recently, technology has become one of the key elements in our daily life. It has a big role in different sectors, especially in business. Organizations and firms have chances of success by following the right technological path. Also, because of the business technology revolution, organizations can improve their communication processes smoothly. The positive impact of technology on business has changed the game of business and the business sector is becoming much more competitive than before. IT has positioned to support organizational goals and objectives, and plays a role in developing long term business strategy, therefore ensuring that IT and business strategy functions are aligned is necessary. Several studies and researches were conducted to highlight the alignment concerns, the first time the alignment mentioned was in the late 1970s [1].

In the recent years, there has been a growing attention to the topic "Business-IT alignment" that was studied in the literature with different terms. According to Porter [2], it is called fit; it is also defined by Ciborra as bridge in [3]; integration by Safferstone [4]; harmony by Luftman [5]; linkage by Henderson & Venkatraman [6]; and fusion by Smaczny [7]. For example, it can be defined as “applying information technology (IT) in an appropriate and timely way, in harmony with business strategies, goals and needs” [5], [8]. Also, it is the linkage between business and IT at the strategic or planning level. That is the degree to which the IT mission, objectives, and plans support, and are supported by, the business mission, objectives and plan [9 - 13]. The alignment must include integration of business strategy, IT strategy,
business infrastructure and IT infrastructure to achieve organization’s objectives as well as improving performance or gaining competitive advantages. However, achieving and sustaining alignment is a big concern and a major challenge for many organizations. In addition, Luftman & Brier [5] presented the enablers and inhibitors that need to be understood and acted upon to achieve alignment. One of the enablers is the support from the senior management, because they define the need for business leaders to cognizant and support technology innovation. Another enabler is the IT management’s participation in the creation of business strategies and development of its own strategies for success. Moreover, one of the key factors for alignment is the IT managers need to understand business environment. Other enablers are appropriate prioritization of activities and strong leadership. The same list for inhibitors show up as well as enablers, so organizations need to focus on maximizing the enablers and minimizing the inhibitors in order to achieve cohesive goals across the organization and allows them to address insufficiencies and realign to the strategic path [14]. The experience in [8] displays that no single activity will enable a firm to attain and sustain alignment.

1.2 Statement of the Problem

The technology has been present in education for many years, so, a research work expects that alignment is even more complicated in (higher) education because the IT leader challenge is to align organizational plans, investments, priorities, and actions not only with institutional priorities emerging from the leadership but also with the link to the fast shifting goals of various colleges, and departments [15]. This expectation finds support in Luftman and Kempaiah’s study in 197 organizations [16], which ranks education as the lowest scoring industry sector on alignment.
maturity. Given the opportunity that IT is offered in teaching and learning [17], [18]. Business–IT alignment is an ultimate goal of governmental and non-governmental organizations that require close attention and continuous monitoring. Since its establishment, the UAE University has been keen to enhance its core business and supporting services with the up-to-date technologies and learning and teaching tools. To get the most benefits of acquiring and using IT in the university, the IT needs to be aligned with the core business and the supporting services. The university has a well-defined business strategy augmented with a well-defined IT strategy. Business–IT alignment will reduce/eliminate any waste and duplication of IT resources, failed projects, difficulties in executing components aspects of business strategy that are IT-dependent or IT-enabled.

The aims of this thesis are reviewing the literature concerning the Business-IT alignment topic, assessing the Business-IT alignment of the as-is architecture of the UAE university using Strategic Alignment Maturity Model proposed by Luftman and analyzing the data to identify the gaps of misalignment. In order to provide the university with the major insights to prioritize the actions for attaining the alignment. Based on the purpose of the research, the following research questions is formulated:

- To what extent the effects of Business-IT alignment/misalignment in universities?

**Hypothesis:** A higher educational organization performance and total spending are positively/negatively affected by the level of maturity and alignment/misalignment between business and IT.
1.3 Literature Review

Several researches and numerous methods, techniques and tools were proposed after Business-IT alignment (BITA) is considered as one of the top ranked management needs. In the annual survey conducted by the Society for Information Management (SIM), BITA was at the top of management concerns in 2003–2016 with the exception of some years when it was in the second place [19]. The SIM study proposes that alignment remains a determined issue due to the changing nature of business and the difficulty that the IT organization has in responding to these changes. Therefore, different researchers studied the role and impact of alignment on business performance such as [8], [20 - 23] The researches provide different factors about alignment and its influence on business. Some alignment researches focused on improving organization performance [24 - 26]. For example, increasing sales revenue [27], [28], enhancing operational efficiency [29], [30], reducing cost [31 - 33], and improvement on customer value [34], [35], [32]. Authors in [36], [37] suggested “aligned” organizations are more likely for investment in IT and allocating resources to projects regarding to all business objectives. Because of the understanding of top management of particular business issues in their company, they welcome what can be done through IT. Moreover, aligned organization force IT to respond and take advantages of opportunities in the market, increase profit and gain sustainable competitive advantages [36], [38], [39]. On the other hand, other researchers found out that aligned organizations reported that there is no changing in their performance e.g. an “alignment paradox” which means organizations risk closing themselves in certain way of doing business when create an inflexible IT backbones and align them to strategy. [31], [40]. The work in [41 - 43] suggested
that alignment can result in stagnation, strategic inflexibility, and competitive disadvantage because it may require specific IT investment and concentrating on alignment as a remedy for IT-related problems can be wasteful. However, other argued that alignment may lead to rigid organization because the tight connection between IT and business restricts the organizations so they will not be able to recognize change, decrease strategic flexibility, and prevent their ability to respond to environmental change [7], [36], [41], [44], [45]. This condition is called “rigidity trap” where the organization may find itself in. It occurs because of the alignment process is too time consuming, costly and need quick responses to change market [46]. In general, different studies summarize that alignment may lead to advantages or disadvantages outcomes for the organizations. Researchers who studied alignment have developed many models to explain how alignment provides value for firms and how it can be used to achieve, assess and maintain BITA. One of the first theory of strategic alignment was introduced in the mid-1980s by Henderson and Venkatraman [20] they developed the strategic alignment framework in 1990. All other developed models were focused on different components and highlighted different perspectives, therefore, this makes it difficult for choosing appropriate BITA models. Moreover, the challenge to achieve the alignment, identified some years ago, remains hard to address in practice where there are various models to measure the alignment. Some models are apparently much more accepted than others, although there seems to be no consensus on the best one [47] and because there is no a comprehensive approach for measuring the capabilities of models. Some of early studies are available like [40] and [49] but a structured comparison between Business-IT alignment models is missing. This is because of the absence of well-known criteria for evaluating the models which are available but spread across many sources in literature [47]. In
addition, after three decades of research in alignment, Chan and Reich [48] summarized 150 different articles on this field in an extensive bibliographical study that included different forms of alignment terms in the literature such as business/IT alignment, business and IT alignment, business–IT alignment, IT alignment, and alignment of business and IT, all have the same meaning. Also, the terms IT, ICT and IS are often used interchangeably. Many studies used different keywords in titles and abstracts, so it was difficult to find relevant articles in order to find different models to compare between them. There are many survey papers purposed such as A Systematic Review of Business and Information Technology Alignment by Ullah [50] who used the guidelines developed by Kitchenham to review the available research papers to understand the business-IT alignment and provide a list of future research direction regarding this field. Also, comparison frameworks can be found in studies such as that by Chan et al. [51]. Moreover, Avesano & Tortorella [52] proposed a literature review to evaluate different alignment approaches that aims to find similarity, maturity, capability to measure, model, assess and evolve the alignment level existing among business and technological assets of an enterprise. Also, another research [47] proposed an evaluation framework that made following design science as a research approach for allowing practitioners in selecting suitable Business-IT alignment models. This framework contained 25 criteria categorized into four groups and it was evaluated by seven IT managers from large Swedish organizations. There are six alignment types provided in literatures that are combined into single model. Gerow et al. [53] highlighted and defined the six alignment types and created a robust alignment framework by building upon Henderson & Venkatraman’s (1993) SAM. They reported on the improvement of the definition and created statistically evaluated operational measures for each alignment type to
create rigorous measures, which was collected from 140 Chief Information Officers. The overall alignment measure will be used to give future researchers a useful tool for studying the 6 types of alignment and their relationship with other constructs.

Finally, the literature covers a collection of different approaches to assess alignment, including case studies, fit models, surveys, conceptual models, and quantitative assessments such as recent papers by Gerow et al. [54] a recent meta-analysis and by Coltman et al. [55] who provide a good summary of much of the history and research in this field.

Recent researches such as paper [56], identified a reference framework to categorize relevant management practices in the process of Business-IT alignment in order to find specific management practices that can help to improve the process of Business-IT alignment and the design of ITG architecture that supports those processes. The analysis was done in a large leading international food and beverage company. The most concern in today’s enterprise is the continuous alignment of business and IT in a fast-changing environment. For this reason, Hinkelmann et al. [57] proposed a new paradigm for next generation enterprise information system. It changes the development approach of model-driven engineering to continuous alignment of business and IT for the agile enterprise. Both human-interpretable graphical enterprise architecture and machine-interpretable enterprise ontologies are supported by metamodeling approach. the Strategic Alignment Maturity Model (SAMM) has been used by Khanfar et al. [58] in a large hospitality and exhibitions company in the middle-east with the same purpose of assessing the alignment maturity between business and IT. They defined the gaps between business and IT, and proposed some measures to bridge these gaps. Helberg [59] presented a model to prove that cohesive business and IT alignment will lead to gain customer’s
satisfaction and achieve business goals. They explained the implementation strategy and plan, described roles and responsibilities, discussed leadership engagement and change management principles, and delivered context for measuring and sustaining alignment. The presented framework of IT and business collaboration models for organizational consideration illustrated function, structure, advantages and disadvantages to several models. In addition, Yayla and Hu [60] mentioned that their knowledge about Business - IT alignment on organizational performance relationship was limited because of the complexity of contingent factors. Also, there were a few studies examined the effects of contextual factors such as market environment and competitive strategy on this relationship. Therefore, their study was to test the alignment-performance relationship in a developing county to fill the gaps in this relationship. Survey data collected in Turkey has been used to investigate the moderating roles of environmental uncertainty and strategic orientation on the performance effects of strategic alignment. Their analysis result showed a better understanding of the relationship between alignment and performance under different environmental and strategic conditions.

Moreover, there are some frameworks like TOGAF that enables the achievement of business objectives through IT standards. TOGAF is an EA (enterprise architecture) framework developed by The Open Group since 1995. When used with any recognized enterprise framework, it will help align IT and business goals by engaging the various stakeholders and involving them into the process model. According to Garnter [61], Enterprise Architecture is a way to create an abstract view of a company (enterprise) or organizations that assist in the planning and making better decisions. EA scope is not limited to technology planning, but by adding strategic planning as a key driver for the company and planning as a source of
program and enterprise resources requirements. TOGAF as defined in [62] provides Architecture Development Method (ADM) that allows organizations to transform their enterprises in a controlled manner in response to business goals and opportunities. This framework ensures alignment and consistency with architecture across the enterprise.

1.3.1 Business- IT Alignment in Higher Education

Furthermore, few research has been conducted in the area of Business-IT alignment in higher education institutions. For instance, in paper [63] a study into business and IT alignment maturity in Dutch vocational education and training organizations was reported, where the demand of collaboration among education and IT departments is important. Their study was performed into the maturity of alignment between these parties for extracting the path of growth in maturity. Luftman’s model was adopted as a framework to analyze the alignment maturity. In another research [64], the authors focused on few researches that relate between the factors for achieving the alignment and organizational performance, for example, if there is a positive IT impact on organizational performance. For this reason, they tried to give a share in the formation of a theoretical model influencing alignment dimension which affects the performance of the organization. The importance of the model is in providing empirical evidence that approves the value of categorizing factors into dimensions in attaining Business-IT alignment and their impact on universities’ performance. Moreover, Erfurth et al. [65] identified the main challenges eliciting requirements in order to improve and to set up IT service that assist academicals and administrative processes of universities. The authors reviewed ITIL and COBIT, which provide improvement and establishment processes
as well as support the operational phase of IT services to identify problem statements in detecting suitable IT services. Moreover, Robertson [66] aimed to confirm the alignment maturity of higher education institutions in the United States compared to the overall industry average reported in this study [16]. His finding supported by statistical evidence that shows the higher education industry average had a lower Business-IT Alignment average than the industry, but these findings showed that an increase by 50.88% in Business-IT Alignment maturity. Also, Al Ghamdi and Sun [67] provided an overview of Business-IT alignment as a big concern that face CIOs in private and public organizations and examined the importance to address these concerns in the higher education sector. They offered suggestions for possible future Business-IT Alignment research in the higher education. In addition, the dissertation done by Smith [68] to increase the understanding of the factors that have an influence in the alignment between institutional strategic planning and information technology strategy in higher education. She tested an existing alignment model (SAM) in the context of mid-size four-year colleges and universities. Her study used a combination of Delphi technique and a survey process.

1.3.2 Business-IT Alignment Models

Henderson and Venkatraman [20] presented their Strategic Alignment Model (SAM) which is useful to treat the IS strategy alignment. It becomes a support for a collaborative process between the business strategy, business organization, IS infrastructure, and IT strategy. All at two different abstraction level of the alignment: functional and strategic [52]. It is one of the most relevant and cited models aiming at helping managers to achieve BITA [69]. In addition, Luftman’s Strategy Alignment Maturity Model (SAMM) [70], which is a framework for measuring or
developing alignment provides an extent understanding for organizations to formulate business models, business strategy, business processes and organizations that are aligned with infrastructure, applications and IT organizations. Also, SAMM provides a set of criteria that can be used to assess the ability of the EA framework and support to achieve strategic business-IT alignment [71]. SAMM model uses six criteria for a complete model and each used as a component of assessment and identification of alignment. These criteria are: Communications, Governance, Skills, Partnership, Competency and Value measurements and Scope and Architecture.

Another model provided by Vargaz Chevez [72], constructed the Unified Strategic Alignment Model based on four strategic business and IT alignment models that consist of many elements of the different existing theories. Also, the “4C model” by Weiss and Anderson [73] that captures the most important elements to enhance alignment between business and IT. The authors in paper [74] redefined the concept of Business–IT alignment as a combined management/design concept by placing it in a combined framework which is a result of generic framework information management and the integrated architecture framework. Its purpose is to provide the foundations for additional research of the alignment concept as a real tool for management and design. It shows the relationship between the key areas of concern involving not only the visualization of the areas or levels but also implied management and design processes. In addition, Other models developed by Reich & Benbasat [12], Sabherwal & Chan [23], and Hu & Huang [75].

Same as Henderson’s and Venkatraman’s [20] strategic alignment model (SAMM), many alignment researches build on the principle of separation between business and IT domains with number of variable elements, such as organizations, plans,
processes, competences etc. It was adopted and studied from empirical perspective such as [76], [38] and has been extended by different researchers [5], [38], [74], [77]. SAMM model was the first important work on Business-IT alignment, which introduced the concepts of alignment to a wide audience and structured the space of investigation [76]. There are some points lead us to choose this model to be used in this thesis. Some of these points are listed as follow:

- SAMM is the most famous and the most discussed model among researchers [38], [78].
- It has attracted the most attention in this field [78] and the most widely cited per the literature review of [79].
- Various studies have taken SAMM as reference model such as [74] and [9].
- Another used it to evaluate and analyze existing works on alignment, for example in [80], [81] and [82].
- The SAMM can be considered as an EAF (Enterprise Architecture framework) because it proposes the construction of a blueprint of an enterprise in support of BITA [63].
Chapter 2: Methods

2.1 United Arab Emirates University IT Strategic Plan

The Division of Information Technology (DoIT) at the UAEU developed an information technology strategic plan that provides long-term and short-term objectives, which are aligned with the UAEU strategic plan. The DoIT strategic plan defines five goals as follows:

1- Customer Focus and Service Oriented,
2- Enable and support Evolving Research Needs,
3- Collaboration and Efficiency through Sharing across Campus,
4- Supporting excellence in Teaching and Learning
5- Student needs, classroom technology, mobile learning, technology based learning, and development of research computing and comprehensive University-wide IT environment.

DoIT goals are aligned with some of the UAEU strategic goals, as shown in the following table:
Table 1: DoIT Goals & UAEU Goals

<table>
<thead>
<tr>
<th>DoIT Strategic Goals</th>
<th>UAEU Strategic Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Customer Focused &amp; Service oriented</td>
<td>Goal 5: Provide up-to-date IT services</td>
</tr>
<tr>
<td>Goal 2: Enable and support evolving research needs of UAEU</td>
<td>Goal 2: Build institutional capacity to meet the research needs in UAEU</td>
</tr>
<tr>
<td></td>
<td>Goal 3: ensuring that the academic procedures and outcomes in the UAEU are at an international standard</td>
</tr>
<tr>
<td></td>
<td>Goal 4: Improve the strategic communications of the university.</td>
</tr>
<tr>
<td>Goal 3: collaboration &amp; efficiency through Information Sharing</td>
<td>Goal 5: Provide up-to-date IT services</td>
</tr>
<tr>
<td>Goal 4: support excellence in Teaching &amp; Learning</td>
<td>Goal 1: Develop and promote innovation in teaching and learning</td>
</tr>
<tr>
<td>Goal 5: An adaptable organization</td>
<td>Goal 5: Provide up-to-date IT services</td>
</tr>
</tbody>
</table>

2.2 Research Design

Strategic Alignment Maturity Model (SAMM) [8] has been widely accepted among researchers and practitioners [52]. It integrates descriptive and prescriptive aspects of alignment. Also, it creates a roadmap that organizations can follow to gain higher levels of IT efficiency which in turn helps them achieve better business performance [83]. The SAMM model is based on 12 elements of Business-IT alignment that are found in SAM model of Henderson and Venkatraman. SAM is defined as BITA framework to enable the implementation of Business and IT and their infrastructure components which are Business strategy, IT strategy, Business infrastructure and IT infrastructure [20], [84]. Luftman adopted SAM as a starting point for his model. Then He suggested a number of enablers and inhibitors [5] as a building blocks, and constructed SAMM based on these results. Companies may use a survey based on Luftman’s model to identify their maturity level. Once the maturity level of the company is defined, the company may develop a roadmap for enhancing the relationship between the business and the IT [8].
Luftman’s theory is found in many articles as a framework for assessing alignment within a company [67], and looks very useful. This assessment method provides enterprises and organizations a tool that gives insights in Business-IT relationship. It can define improvement areas and facilitates an open discussion with executives from business and IT. The six criteria of SAMM include several elements that need an attention, not at one specific, but all criteria should be in harmony.

2.2.1 The Six Criteria of Strategic Alignment Maturity

Strategic Alignment Maturity model contains six alignment criteria and each has several attributes as shown in Figure 1.

These areas are:
1- **Communication:** this criterion refers to the intensity and quality of the exchangeable ideas, knowledge, and information between IT and business organizations. It enables stakeholders to clearly understand their respective strategies, plans, business or IT environments, risks, priorities, and how to achieve them. Different researches such as [12], demonstrate that successful communications between business and IT increase a common understanding and influence positively the alignment, as understanding is instrumental in achieving coordinated activities. In addition, IT and business executives learn to listen, understand, and respect one another while engaging in
communications. This help the cooperative leveraging of resources that can build competitive advantage [8]. This criterion facility integrates and effectively coordinate plans between IT and the business [85]. However, the lack of communications between the two parties mean a lack of investment in IT and missing opportunities [8]. Finally, communications will lead to trusted relationships between IT and business executives in the university, which is important and needed as it grows and the integration across the enterprise and its external partners. This allows higher risk taking, faster responses, and better accountability.

2- Competency/Value Measurement: this refers to the possible use of metrics to show the contributions of information technology and the IT organization to the business in terms that both the business and IT understand and accept. The analysis of the performance and operations are needed in all organizations. Currently, many IT organizations can't prove their value to the business in understandable terms. IT and business in the university need to participate and generate shared and consistent measures of performance that help track their performance. To do so effectively, it requires to apply technical expertise from the IT function to provide demonstrable measures in forms that the business can know. Likewise, the business needs to learn to apply and expect competencies from the measurement within IT. This balanced process shows the value of IT in terms of its contribution to track and learn from business initiatives, and helps the management ability to prove IT’s value contributions [8].

3- Governance: involve the processes that IT and business manager’s use at strategic, tactical, and operational levels to establish IT priorities, allocate
resources, and control activities. In addition, it concerns with how well the organization links its business strategy to current IT priorities, technical planning, managing risk, and budgeting. It defines who set the decisions, why they make them, and how they make them. The university needs the activities of Governance to participate on achieving alignment by assisting to recognize the value of IT; create informed IT investment decisions and realize business vision and strategies and the role of IT in achieving them. The key actions for governance according to Luftman [8] are steering committees, IT-business liaisons, budget and human resource/sourcing allocation processes, boundary management of the IT function, and assessments of IT services by business executives. Those actions that create a shared direction rather than just trying to monitor IT initiatives, should be provided by the governance and should be more focused than the others. As noted by Huang et al. [86], “well-designed and orchestrated IT governance mechanisms are expected to produce IT-related decisions, actions and assets that are more tightly aligned with an organization’s strategic and tactical intentions.”

4- **Partnership:** refers to the level of relationship between business and IT organizations. This involves determining IT’s role in business strategies, the degree of trust between the two parties, and how each sees the other’s contribution. It is essential for the IT function to immediately participate with the business functions, which can make reciprocal trust, make realistic expectations, and build efficient relationships. Therefore, it is easier to achieve cross functional alignment that sustain working relationships which help understand and commit to shared strategies as they lead to risk and reward sharing [14]. According to Reich and Benbasat [12] and Luftman and
Brier [14], both IT and business executives in the university must realize the requirement for collaboration and the increased value of relationships.

5- **Scope & Architecture:** it refers to the constant process of provisioning a flexible infrastructure, its evaluation, and the application of emerging technologies and delivery of customized solutions for business units and external customers or partners. This criterion focuses more on impact of IT services, which happen through appropriate and innovative scoping of what the IT function does to provide demonstrable business value [8]. The alignment processes include scoping, which is the only set of technical activities. For this reason, dynamic scoping is required in the university because any change in its business scope will require its infrastructure need to be re-scoped. Obviously, it is about the university reaction on using the new technology, if IT enables or drive business processes and strategies and if the university can be flexible towards user’s needs.

6- **Skills:** this criterion refers to the human resources actions like hiring, retaining, training, performance feedback, innovation encouragement, career opportunities, and individual skill development within IT. Also, it measures the organization’s preparation for changing, learning capability, and capability to leverage new ideas. It is hard to accomplish the needed levels of communications, value analytics, and partnering without the appropriate investing and balancing of skills and competencies across the business and IT organization [8].

**2.2.2 The Five Levels of Strategic Alignment Maturity**
The Strategic Alignment Maturity model (SAMM) involves five levels of maturity as shown in Figure 2. The relative importance of each of the attributes within the criteria may differ among organizations [8]. Each of the six criteria described in the main part of this article are evaluated in deriving the level of strategic alignment maturity.

Figure 2: The Five Levels of SAMM [8]

**Level 1 – Initial / AD Hoc process:** if the university meets many of the characteristics of this level, it will not be able to attain the alignment between the business strategy and IT strategy because of the failing to handle its IT investments.
**Level 2 – Committed process:** Level 2 of Strategic Alignment Maturity tends to be directed at functional level within the enterprise like Marketing, Finance, Manufacturing and HR. However, the achievement of the alignment in the university can be difficult because of the limited awareness by the business and IT communities of the different functional use of IT. Although, the business - IT alignment at the local level is typically not leveraged by the enterprise, the potential opportunities are beginning to be recognized [8].

**Level 3 - Established focused process:** if the university will be in this Level, it can be described as having established a focused Strategic Alignment Maturity. At this level, IT becomes embedded in the business, focuses governance, processes and communications for specific business objectives [8]. Moreover, level 3 influences IT assets on an enterprise-wide basis and applications systems show planned, managed direction different from traditional transaction processing to systems that use information to make business decisions. The IT extra structure is improving with key partners.

**Level 4 – Improved/ Managed process:** if the university will be at level 4, it can be described as having a managed Strategic Alignment Maturity. At this level, the concept of IT as a value center is supported by effective governance and services [8]. Level 4 leverage IT assets on an enterprise-wide basis and applications systems concentrate on improving business process to gain sustainable competitive advantage. Where IT is viewed as an innovative and imaginative strategic contributor to success.

**Level 5 – Optimized process:** at level 5 in the Strategic Alignment Maturity, the university can be described as having an optimally aligned Strategic Alignment
Maturity. The IT strategic planning process and the strategic business process are integrated by sustained governance processes. At level 5, organizations leverage IT assets on an enterprise-wide basis to expand the reach of the organization into the supply chains of customers and suppliers [8].

2.2.3 Processes of Strategic Alignment

Luftman and Brier defined some steps that must be taken to maximize alignment enablers and minimize the inhibitors [14] in order to attain and sustain business-IT alignment. These steps are:

1-  Set the goals and establish a team: for evaluating the maturity of the business-IT alignment.

2-  Understand the business-IT linkage: by evaluating each of the six criteria.

3-  Analyze and prioritize gaps: to understand the activities necessary to improve the business-IT linkage.

4-  Specify the actions: to enhance the alignment.

5-  Choose and evaluate success criteria: discussing the measurement criteria identified to evaluate the implementation of the project plans.

6-  Sustain alignment: to sustain the benefit from IT.

The next step is most important part of the process which is the creation of recommendations addressing the problems and opportunities recognized [8]. The outcomes of the survey are indicative of the problem/opportunities being addressed. After assessing the criteria and define the level of the alignment for the organization, the next higher level of maturity is applied as a roadmap for identifying what should be done next.
2.3 Data Collection

The data were collected using a qualitative survey that was conducted in the UAE university. The survey includes 39 questions divide into six sections [8] (see Appendix 4). The answers follow a logical sequence of five possible answers, and it ranges from an immature answer, up to a mature answer, where a numerical score to each answer from 1 to 5 has been assigned. For example, the five levels of maturity that form the scale are represented as follow:

- 1 = Doesn’t fit the company, or the company is very ineffective
- 2 = Low level of fit for the company
- 3 = Moderate fit for the company, or the company is moderately effective
- 4 = Fits most of the company
- 5 = Strong level of fit throughout the company, or the company is very effective.

This helped to have a complete assessment to plot the results and then derive the level of alignment. An online survey from Google called “Google Forms” has been used, where the responses are collected and analyzed in an online spreadsheet. Also, each response in a single row of a spreadsheet, with each question shown in a column.
Chapter 3: Results Analysis and Discussions

According to the organizational chart of the university, a number of departments are selected to be visited. As a first step for conducting the survey in the university, an approval letter has been got from the administration. I have carefully chosen the persons of interest in relation to the research question, so the targeted employees are at executive-level positions and directors. Furthermore, they have been asked to respond to the survey from their point of view and prior experiences, to rate the university’s behavior and to assure good validity.

It is important to have the right employees to participate in the survey and to be able to represent the target sample. Figure 3 shows the organizational chart, where the number of chosen departments were 20, and it has been decided to choose five members from each department that includes executives, unit directors, key managers of the sector and the employees. So, the targeted number was 100 employees.

By using the sample size calculation, it showed that 41 responds are enough to validate the results of this study. However, a total of 42 employees responded to the survey, out of 100 target employees.
Figure 3: Organizational Chart of UAEU
Each criterion of the Strategic Alignment Maturity Model is assessed individually to determine the university level of strategic maturity. Figure 4 depicts the maturity criterion and the alignment level for the UAE university.

When viewing the results in Figure 4, it becomes apparent that the total average business-IT alignment level for the university is between level 3 and 4. As observed, 'Scope & Architecture', 'Value Measurement', 'Governance' and 'Partnership' maturity criteria approximately show the same average level which is 3.4. However, the lowest alignment levels can be seen in maturity criteria 'Communications', while 'Skills' scored the highest of the six (average maturity 3.7). Moreover, an analysis of attributes for each criterion with lowest maturity was conducted to find the gaps analysis of the least mature elements.

3.1 Communication

In this criterion, we measure the level of understanding between people of IT and business as well as with external parties such as business partners. The analysis shows that communication is in level 3, which means the university’s business-IT communications is at the Established Focused Process level.
As shown in Table 2, the follow-up assessment of the university’s strategic alignment maturity need to move from level 3 (As-is) to a Level 4 (To-be) for this criterion.
Each of the Communication’s attributes (C1, C2, …etc) - (see Table 2 ), were collected and analyzed to define their level. So, the lowest score for the alignment levels in communication attributes as shown in Figure 5 were:

1- The learning process within/between departments

2- The Communication style used within the organization

**Major insights:** The University demonstrated some strong communications process, however, it needs to have regular informal communication with supervisors and department heads. In order to inform both business and IT employees on the objectives, status, and achievements of major IT projects and initiatives. So, an open communication is important in the process of achieving and maintaining alignment. The IT and business need to work together to identify opportunities to enhance effective and efficient communications among them. IT staff need an opportunity to work closely with senior business managers.
3.2 Competitive/Value Measurement

The second criterion of the alignment tools measures the self-assessment level of project performance in addition to the improvements achieved after the evaluation. This criterion as revealed in the analysis is in the third level which is the Established Focused Process level. The university needs to understand the activities necessary to move to the next level as shown in Table 3.

Table 3: Value Measurement Criterion From (As-is) to (To-be)

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Attributes</th>
<th>Level 3 (As-is) Characteristics</th>
<th>Level 4 (To-be) Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM1</td>
<td>IT Metrics</td>
<td>Traditional financial</td>
<td>Cost effectiveness</td>
</tr>
<tr>
<td>VM2</td>
<td>Business Metrics</td>
<td>Traditional financial</td>
<td>measuring customer value</td>
</tr>
<tr>
<td>VM3</td>
<td>Balanced Metrics</td>
<td>Business and IT metrics becoming linked</td>
<td>Business and IT metrics formally linked</td>
</tr>
<tr>
<td>VM4</td>
<td>Service level Agreements</td>
<td>Emerging across the enterprise</td>
<td>Enterprise Wide</td>
</tr>
<tr>
<td>VM5</td>
<td>Benchmarking</td>
<td>Emerging</td>
<td>Routinely perform</td>
</tr>
<tr>
<td>VM6</td>
<td>Formal Assessments/Reviews</td>
<td>Emerging formality</td>
<td>Formally performed</td>
</tr>
<tr>
<td>VM7</td>
<td>Continuous Improvements</td>
<td>Emerging</td>
<td>Frequently</td>
</tr>
</tbody>
</table>
The analysis in Figure 6 shows the lowest score, for this section which are:

1- The way of measuring the value of projects (metrics) by IT.

2- The degree of Service level agreements

Major insights: The university’s service level agreements between the IT function and business need to be global and regional services. Primarily, the university’s metrics aimed to encourage more efficient and competitive IT-enabled processes. Level 3 and level 4 SLAs are both technically and relationship oriented are at the functional level. But SLAs in level 3 are emerging at the enterprise level. while, Level 4 SLAs mature beyond Level 3 at the enterprise level. Perhaps the university’s rating is low because they see SLAs as only setting the baselines for IT delivery, not for contributing to business success. SLAs set expectations for IT support create proper SLAs, and effective management processes around them, the business needs to understand IT processes. Also, measuring IT’s contribution to the business should go beyond traditional.
3.3 Governance

This criterion concentrates on the people who are responsible for decision making, the reasons they make them, and how they make them. Governance received an overall maturity score of 3.4, as did Partnership, Value measurement, Scope and Architecture. These four components of alignment maturity tied for the second maturity score. Which means all are in Established Focused Process level.

Table 4: Governance Criterion From (As-is) to (To-be)

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Attributes</th>
<th>Level 3 (As-is) Characteristics</th>
<th>Level 4 (To-be) Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Business strategic planning</td>
<td>Some IT input and cross functional planning</td>
<td>Managed across the enterprise</td>
</tr>
<tr>
<td>G2</td>
<td>IT strategic planning</td>
<td>Some business input and cross functional planning</td>
<td>Managed across the enterprise</td>
</tr>
<tr>
<td>G3</td>
<td>Reporting/ Organization structure</td>
<td>Central/Decentral; Some federation; CIO reports to COO</td>
<td>Federated; CIO reports to COO or CEO</td>
</tr>
<tr>
<td>G4</td>
<td>Budgetary control</td>
<td>Cost Center; Some projects treated as investments</td>
<td>IT treated as investment Center</td>
</tr>
<tr>
<td>G5</td>
<td>IT investment management</td>
<td>Traditional; Process enabler</td>
<td>Cost effectiveness; Process driver</td>
</tr>
<tr>
<td>G6</td>
<td>Steering committee(s)</td>
<td>Regular clear communication</td>
<td>Formal, effective committees</td>
</tr>
<tr>
<td>G7</td>
<td>Integration of IT project prioritization</td>
<td>Determined by the business function</td>
<td>Mutually determined between senior and mid-level IT and business management</td>
</tr>
</tbody>
</table>

For effective IT governance, companies need effective communications, partnerships, and value metrics between IT and the business [8]. The university
should focus on some actions in this section to move to next higher level as shown in Table 4.

![Figure 7: Alignment Level of Governance Attributes](image)

These specific actions are defined with lowest score at the analysis results (see Figure 7) for example:

1- Steering committee(s)

2- Integration of IT project prioritization

**Major insights:** IT steering committee(s) with senior level IT and business management participation should be formal, regular committee meetings. Also, the IT project should mutually determine between senior and mid-level IT and business management.

### 3.4 Partnership

This criterion focuses in the level of mutual trust and partnerships between the two parties (business and the IT departments) of the university.
Table 5: Partnership Criterion From (As-is) to (To-be)

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Attributes</th>
<th>Level 3 (As-is) Characteristics</th>
<th>Level 4 (To-be) Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Business perception of IT value</td>
<td>IT enables future business activities</td>
<td>IT is part of the business strategy</td>
</tr>
<tr>
<td>P2</td>
<td>role of IT in the strategic business planning</td>
<td>Business process driver</td>
<td>Business strategy enabler/driver</td>
</tr>
<tr>
<td>P3</td>
<td>Shared risks, goals and rewards</td>
<td>Sharing of risks and rewards is emerging</td>
<td>Risks and rewards are always shared</td>
</tr>
<tr>
<td>P4</td>
<td>IT program management</td>
<td>Standards Adhered</td>
<td>Standards evolve</td>
</tr>
<tr>
<td>P6</td>
<td>Relationship/ Trust Style</td>
<td>IT is emerging as a valued service provider</td>
<td>The association is primarily a long-term partnership style of relationship</td>
</tr>
<tr>
<td>P7</td>
<td>Business sponsor/champion</td>
<td>At the functional organization</td>
<td>At the HQ level</td>
</tr>
</tbody>
</table>

Table 5 shows the actions that should be done by the university to increase their maturity level from level 3 to level 4. Some specific actions with low score of maturity level shown in Figure 8:

Figure 8: Alignment Level of Partnership Attributes
1- Business perception of IT value
2- Pervasiveness of trust and value

**Major insights:** A long term partnership and mutual trust between business and IT departments within the university need to be developed and letting IT to be part of business strategy.

### 3.5 Scope and Architecture

This criterion of alignment tools measures the level at which IT has evolved from being considered as a support instrument to providing a business with a competitive advantage. It indicates how well IT provides a flexible infrastructure, introduces emerging technologies, fosters business process change, and delivers value to the business, customers, and partners.

**Table 6: Scope and Architecture Criterion From (As-is) to (To-be)**

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Attributes</th>
<th>Level 3 (As-is) Characteristics</th>
<th>Level 4 (To-be) Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA1</td>
<td>Traditional, enabler/driver, external</td>
<td>Business process enablers (IT supports business process change).</td>
<td>Business process drivers (IT is a catalyst for business process change).</td>
</tr>
<tr>
<td>SA2</td>
<td>IT standards articulation</td>
<td>Emerging enterprise standards</td>
<td>Enterprise standards</td>
</tr>
<tr>
<td>SA3</td>
<td>Degree of architectural integration.</td>
<td>Integrated across functional units.</td>
<td>Integrated across functional units and business partners/alliances</td>
</tr>
<tr>
<td>SA4</td>
<td>Degree of architectural transparency, agility, flexibility</td>
<td>Transparent at the functional level</td>
<td>Transparent across the entire organization</td>
</tr>
</tbody>
</table>
Table 6 shows where the university stand now and where it needs to be after concentrating in some activities of this criterion of maturity level. The lowest score of Scope and Architecture attributes as shown in Figure 9 is:

1- Traditional, enabler/driver, external

![Figure 9: Alignment Level of Scope & Architecture Attributes](image)

**Major insights:** The university demonstrated by its use of emerging technologies, but IT sector in the university needs to support a flexible infrastructure that is transparent to all business partners and customers and drive business processes and strategies as a true standard.

### 3.6 Skills

The last criterion of the Luftman model assesses the skills of staff and how are capable of quick learning, innovating and understanding of business drivers and technology concepts. Skills received the highest overall score of 3.7 among the six criteria. As indicated in the survey’s responses, all staff chose the fourth choice of all questions in this section (between 40% and 55% of the employees), which shows us
that this section is almost in level 4. Therefore, the university should focus and find the gaps that will help it move to level five as shown in Table 7.

Table 7: Skills Criterion From (As-is) to (To-be)

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Attributes</th>
<th>Level 4 (As-is) Characteristics</th>
<th>Level 5 (To-be) Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Innovation, Entrepreneurship</td>
<td>Strongly encouraged at the functional unit level.</td>
<td>Strongly encouraged at the functional unit and corporate levels.</td>
</tr>
<tr>
<td>S2</td>
<td>Locus of Power</td>
<td>Across the organization</td>
<td>All executive, including CIO &amp; partners</td>
</tr>
<tr>
<td>S3</td>
<td>Management Style</td>
<td>Profits/ value based</td>
<td>Relationship based</td>
</tr>
<tr>
<td>S4</td>
<td>Change Readiness</td>
<td>High, focused / Easy</td>
<td>High, focused / Very easy</td>
</tr>
<tr>
<td>S5</td>
<td>Career crossover</td>
<td>Across the functional organization</td>
<td>Across the enterprise</td>
</tr>
<tr>
<td>S6</td>
<td>Education, cross-training</td>
<td>At the functional organization</td>
<td>Across the enterprise</td>
</tr>
<tr>
<td>S7</td>
<td>Social, Political, Trusting environment</td>
<td>Trust and confidence among IT and business is achieved.</td>
<td>Trust and confidence is extended to external customers and partners</td>
</tr>
</tbody>
</table>

Figure 10 shows the lowest score of the attributes regarding this criterion is:

1- Locus of power

Major insight: The important IT decisions in the university should be made by All executives, including CIO and partners / Extended to all staff including IT.
3.7 Alignment Level per Administrations and Departments

**Administration**: Figure 11 illustrates the alignment level per administrations in the United Arab Emirates University where each administration includes different departments.
Table 8: Abbreviations of the Administration in UAEU

<table>
<thead>
<tr>
<th>Administration</th>
<th>Abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vice Chancellor</td>
<td>A1</td>
</tr>
<tr>
<td>Strategy &amp; Future Dept.</td>
<td>A2</td>
</tr>
<tr>
<td>Information Technology Sector</td>
<td>A3</td>
</tr>
<tr>
<td>Media &amp; communication Dept.</td>
<td>A4</td>
</tr>
<tr>
<td>International Relations Dept.</td>
<td>A7</td>
</tr>
<tr>
<td>Deputy VC for academic affairs</td>
<td>A6</td>
</tr>
<tr>
<td>Deputy VC for Research &amp; graduate studies</td>
<td>A7</td>
</tr>
<tr>
<td>Deputy VC for finance &amp; admin affairs</td>
<td>A7</td>
</tr>
<tr>
<td>Deputy VC for Students affairs &amp; enrollment</td>
<td>A9</td>
</tr>
</tbody>
</table>

Table 8 shows the abbreviations of the Administrations. Apparently, the level of the alignment of all administrations is between 3 and 4. Interestingly, three administrations scored the highest of the nine (almost 4) which are A6, A4, A3 (Deputy VC for academic affairs, Media & communication Department, IT) respectively. While A7 (Deputy VC for Research & graduate studies) scored the lowest 3.2.
Departments:

Figure 12: Alignment Level per Department

Figure 12 shows the liner chart of the level of six alignment maturity criteria for each department. This chart indicates that skills have the highest point in three departments which are D13, D15, D18 while the lowest point is D19 which also have the lowest score in all maturity criteria (2.6) except the value measurement (3.1). On the other hand, Communication shows the lowest points in D17 scored 2.5. Moreover, D10 and D11 have the same score for all maturity criteria which scored 3. See Table 9 to see the abbreviations of the department’s names.
Table 9: Abbreviations of the Departments of UAEU

<table>
<thead>
<tr>
<th>Department</th>
<th>Abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategy &amp; Future Dept.</td>
<td>D1</td>
</tr>
<tr>
<td>Human Resources Dept.</td>
<td>D2</td>
</tr>
<tr>
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<td>Center for Excellence in Teaching &amp; learning</td>
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<td>Research Centers and institutes</td>
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<tr>
<td>International Relations Dept.</td>
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</table>
Chapter 4: Limitations and Lessons Learned

This research found that strategic alignment at UAEU is an established process, which is good communication between business and IT, some cost effectiveness defined, relevant processes exist in the organization and IT is seen as an asset driver. However, as discussed in previous chapter there are still some improvements in communication, governance and partnership and other criteria with low alignment maturity score need to be improved. This can be achieved by follow the steps provided by Luftman which are: First, an evaluation team need to assess each of the criteria individually, this team includes IT and business executives from the university. Then, all attributes for each criterion are rated on a 1-5 point Likert scale. Based on this rating, each criterion and its attributes will be categorized at level 1, level 2, level 3, level 4 or level 5. After that, the team use their individual ratings to have the overall assessment level of maturity for the university. Finally, the evaluation team find specific opportunities and apply the next higher level of maturity as a perspective roadmap to improve the alignment of the university.

UAEU at level 4 will be able to attain whereby bonding between business and IT is improved, dashboards are managed periodically, governance is managed across the organization and IT enables the Business Strategy smoothly. The last stage is to work towards the last level of the alignment which is Optimized Level, where the communication becomes informal and pervasive, value measurement is extended to partners, governance is integrated across the organization, partnership is co-adaptive between departments and architecture evolves with the partners.

Moreover, for a validation of the contribution to our study it was necessary to determine whether the six SAM factors significantly different across the all
departments and administrations. The result showed that there are a few differences between the scores of each department. These findings are important to UAEU, it provides them with information that may help them improve misalignment which may cause problems in IT/business strategic planning, budgeting, investment decisions, prioritization, and support. For this reason, having ideas on potential weaknesses and strengths will help UAEU to target specific areas to improve.

This thesis has several limitations, which should be mentioned, that can provide opportunity for future research. The primary limitation is that I was planning to define the as-is enterprise architecture of the UAEU using TOGAF enterprise architecture with new business model of the university and then developing a Business-IT alignment framework for continuous alignment. For this reason and because of the short time required to finish this thesis I defined the as-is architecture and suggested to-be level for the university using the Maturity model provided by Luftman. Additionally, allocating time to take this survey was also a big concern because meeting participants and making the interviews could have increased the sample size and engender more enthusiasm to take the survey.

Despite all these limitations, this study provided a positive social change in the UAEU because it provided data that never existed before that may could be used for future studies. Moreover, I recommend that future researchers should attempt to assess a bigger sample sizes. Another recommendation is that the decision makers within UAEU should use this study as a guide in addressing the need for better business strategy measures and make improvements.
Chapter 5: Conclusion

Luftman’s Strategic Alignment Maturity model provides practitioners and academics with a practical tool to assess and develop an organization’s capability to align IT to business requirements and opportunities. This thesis has applied a SAMM model to define the alignment between the business and IT in a higher education institution, United Arab Emirates University as a case study. The results displayed that the alignment start to be established between business and IT (level 3) in the university. Also, these results identified that a higher alignment maturity correlates with higher organization performance. That means, a higher educational organization performance and total spending are positively affected with a higher level of maturity and alignment between Business-IT. For example, communications which is one of the enablers of the Alignment between business and IT, have positive impact on the university’s performance, because exchanging of ideas, understanding on how to facilitate a successful strategizing process and knowledge sharing is a key success factor in this manner. Moreover, value analytics have a positive impact on the Alignment, because of the mutually dashboards between the strategies that demonstrates IT value in terms of contribution to the business as well as service levels assessed by IT translated in terms of the business, result with a good performance of the university. The Governance activities are part of the success factors that impact the university’s performance if a clear defined authority for resources, risks, conflict resolutions and responsibility for IT is shared among the parties. The main advantage for the university, when there is a good partnership between Business and IT, where IT enables and drives changes to business processes and strategies and management executives has a clearly defined and shared vision. In
addition, with a high technology scope maturity, the university will have a flexible and transparent infrastructure. The last maturity factor is about the skills that are included in the university. With high skilled employees who are capable of quick learning, feel personal responsibility for innovativeness, the university will have a high performance. However, a deeper analysis also shows that there are many areas of concern with low alignment maturity representing gaps that can be readily improved through management interventions.
References


### Appendix 1: SAMM’S Criteria and Attributes

<table>
<thead>
<tr>
<th>Dimension Definition</th>
<th>Items</th>
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</table>
| **Communications** measures the level and effectiveness of the exchange of ideas, knowledge, and information between IT and business organizations which enables both to understand the respective strategies, plans, business and IT environments, risks, priorities. | 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 Effectiveness |
| **Value Analytics** taps into the level of using metrics to demonstrate the contributions of information technology and the IT organization to the business in ways that both the business and IT understand and accept. | VM1 -IT metrics  
VM2 -Business Metrics  
VM3 -Integrated IT and Business metrics  
VM4 -Service Level Agreements  
VM5 –External Benchmarking  
VM6 -Formal Assessments/Reviews  
VM7 -Continuous Improvement  
VM8 -IT function contribution |
| **Governance** defines formal processes around IT decisions and the level of discipline which IT and business manager’s use at strategic, tactical, and operational levels in setting IT priorities and allocating IT resources. | G1 -Business Strategic Planning  
G2 -IT Strategic Planning  
G3 -IT Organizational Structure  
G4 -IT Reporting  
G5 -IT Budgeting  
G6 -IT Investment Decisions  
G7 -Steering committee  
G8 -IT Prioritization Process  
G9 -IT Reaction Capacity |
| **Partnering** gauges, the scope and level of activities to maintain working relationships between business and IT organizations, the degree of trust and how each perceives the other’s contribution. | P1 -Business Perception of IT Value  
P2 -Role of IT in Strategic Business Planning  
P3 -Shared Goals, Risk, Rewards/Penalties  
P4 -T Program Management  
P5 -Relationship/Trust Style  
P6 -Business Sponsor/Champion |
| **Scope measures** the level of IT’s provisioning activities that promote creation of a flexible IT infrastructure, evaluation and application of emerging technologies, activities that drive business process change, and activities that deliver innovative customized solutions to business units. | SA1-Traditional, Enabler/Driver, External  
SA2 -Standards Articulation  
SA3 -Architectural Integration  
SA4 -IT infrastructure flexibility |
| **skills** capture critical human resource activities, such as hiring, retention, training, performance feedback, innovation encouragement, career opportunities, and individual skill development. It also covers activities that promote to IT organization’s readiness for change, learning, and ability to leverage new ideas. | S1 -Innovative Entrepreneurial Environment  
S2 -Cultural Locus of Power  
S3 -Change Readiness  
S4 -Career Crossover  
S5 –Training/Talent improvement to Learn  
S6 -Interpersonal Interaction  
S7 -Hiring and Retaining |
Appendix 2: Alignment Level per Departments

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## Appendix 3: Alignment Level per Administrations

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Appendix 4: A Survey on “BITA in Higher Education Institutions”

Business-IT alignment refers to applying Information Technology (IT) in an appropriate and timely manner, in harmony with business strategy. Business-IT alignment is becoming the key concern of business and IT executives in private and public organizations. In my capacity as a master student at the College of Information Technology (CIT), United Arab Emirates University (UAEU), I am conducting a master's thesis research to assess the maturity level of business-IT alignment in the UAEU. The purpose of this survey is to collect enough information that will be analyzed to determine the maturity level.

As an employee of the UAEU, you have been selected to participate in this survey. The survey is divided into six sections, namely, communications, competency, governance, partnership, scope and skills. The total survey is expected to take 15 minutes. Your participation would add a significant value to this research.

Any information you provide will remain confidential and anonymous. Your participation in this survey is voluntarily. You can withdraw at any time from this study.

- I have read the above information and I volunteer to participate in this study

Nayla Salem Alkhatri
Master of IT Management Candidate
College of Information Technology
United Arab Emirates University
Email: 200616596@uaeu.ac.ae

A. Communication:
Ability to use a common and clear language between Business and IT organizations and ensure ongoing knowledge sharing across the organization.

1. Understanding of Business by IT: Does IT management and staff understand the business?

   Mark only one oval.

   - IT management lack understanding
   - Limited understanding by IT management
   - Good understanding by IT management
   - Understanding encouraged among IT staff
   - Understanding required of all IT staff
2. Understanding of IT by Business: Does business management and staff understand IT?

*Mark only one oval.*

- Business management lack understanding
- Limited understanding by management
- Good understanding by managers
- Understanding encouraged among staff
- Understanding required of all staff

3. Inter/ Intra Organizational Learning: How does the learning process within/between departments is conducted?

*Mark only one oval.*

- Casual conversation and meetings
- Newsletters, reports, group email
- Training departmental meetings
- Formal methods sponsored by senior management
- Learning monitored for effectiveness

4. Protocol Rigidity: What is the communication style used within the organization?

*Mark only one oval.*

- Business to IT only / formal
- One way, somewhat informal
- Two way, formal
- Two way, somewhat informal
- Two way, Informal and flexible

5. Knowledge Sharing: How do you think knowledge sharing is facilitated?

*Mark only one oval.*

- Adhoc,
- Unstructured
- Semi structured
- Structured around key processes
- Formal sharing at all level
- Formal sharing with partners

6. Liaison(s) Breadth/ Effectiveness: How is the communication facilitated between the business and IT?

*Mark only one oval.*

- None or used only as needed
B. Competency/value Measurements:
Demonstrating the value IT is contributing to the business.

1. IT metrics: Focus of the metrics and processes to measure IT's contribution to Business.
   *Mark only one oval.*
   - Technical only; Not related to business
   - Technical cost; metrics rarely reviewed
   - Review; Traditional financial
   - Cost effectiveness
   - Extended to external partners

2. Business metrics: Focus of the metrics and processes to measure Business contribution.
   *Mark only one oval.*
   - IT investment measured rarely
   - At the functional organization
   - Review / Traditional financial
   - Also measure customer value
   - Balanced scorecard, include partners

3. Balanced metrics: Degree of an orientation of integrated IT and Business measures
   *Mark only one oval.*
   - Value of IT investment rarely measured
   - Business and IT metrics unlinked
   - Business and IT metrics becoming linked
   - Business and IT metrics formally linked
   - Balanced; Business, partners and IT metrics linked

4. Degree of Service level agreements: The level in which provision of services of IT are described and agreed upon.
   *Mark only one oval.*
   - Do not use SLAs or do so sporadically.
   - SLAs are primarily technically oriented (for technology performance) between the IT and functional organizations.
   - SLAs are both technically oriented and relationship oriented that are between the IT and functional organizations and also emerging across the enterprise.
SLAs are both technically oriented and relationship oriented, between the IT and functional organizations as well as enterprise wide.

SLAs are both technically oriented and relationship oriented, between the IT and functional organizations as well as at enterprise wide and with our external partners/alliances.


*Mark only one oval.*

- Seldom or never perform either informal or formal benchmarks.
- Routinely perform informal benchmarks.
- Perform formal benchmarks and seldom take action based on the findings (specific processes).
- Routinely perform formal benchmarks and usually take action based on the findings.
- Routinely perform formal benchmarks and have a regulated process in place to take action and measure the changes.

6. Formal assessments/reviews: Frequency and Formality of IT assessments and reviews (The level in which projects are structurally evaluated after completion)

*Mark only one oval.*

- None
- when there is a problem
- Emerging formality
- Formally performed
- Routinely performed

7. Degree of continuous improvement practices: The level of which the criteria of IT performance are developed or improved.

*Mark only one oval.*

- None
- Minimum
- Emerging
- Frequently
- Routinely performed

C. Governance

Ensuring that the appropriate participants of business and IT are reviewing the priorities and allocation of IT resources.
1. Degree of business strategic planning with IT investment: The level where strategic or long-term plans for the organization are developed as a whole

*Mark only one oval.*

- Not done, or done as needed
- Basic planning at the functional level, slight IT input
- Some IT input and cross functional planning
- Managed across the enterprise
- Integrated across and outside the enterprise (with IT and partners)

2. Degree of IT strategic planning with business involvement: The level where strategic or long-term plans for IT are developed within the organization

*Mark only one oval.*

- Not done, or done as needed
- Basic planning at the functional level, slight business input
- Some business input and cross functional planning
- Managed across the enterprise
- Integrated across and outside the enterprise

3. Reporting/Organization structure: The level of reporting of the IT manager or CIO to the Director or CEO

*Mark only one oval.*

- Central/Decentral; CIO reports to CFO
- Central/Decentral; Some colocation; CIO reports to CFO
- Central/Decentral; Some federation; CIO reports to COO
- Federated; CIO reports to COO or CEO
- Federated; CIO reports to CEO

4. Budgetary control: The level in which IT is being viewed as a business investment and not as necessary costs

*Mark only one oval.*

- Cost Center; Erratic spending
- Cost Center by functional organization
- Cost Center; Some projects treated as investments
- IT treated as investment Center
- Investment Center; Profit Center

5. IT investment management: The level in which IT is being viewed as an asset that can improve the organization’s competitive advantage

*Mark only one oval.*
6. Steering committee(s): pertain to IT steering committee(s) with senior level IT and business management participation:

*Mark only one oval.*

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

7. Integration of IT project prioritization: The level in priorities of IT projects are set in consideration between both business and IT

*Mark only one oval.*

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

**D. Partnership**

The relationship between the business and IT organization and how each perceives the other’s contribution based on mutual trust and sharing risks and rewards.

1. Business perception of IT value: How the business perceives the value IT brings to the organization.

*Mark only one oval.*

- IT perceived as a cost of business.
- IT is becoming an asset.
o IT enables future business activities.
o IT is part of the business strategy.
o A partner with the business that co-adapts/ improvises in bringing value to the firm.

2. What role does the IT have in the strategic business planning? 

*Mark only one oval.*

- No seat at the business table; IT does not have a role.
- Business process enabler
- Business process driver
- Business strategy enabler/driver
- IT Business adopt quickly to change.

3. Please rate how the risks, goals and rewards between IT and the business are shared. 

*Mark only one oval.*

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

4. IT program management: 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 

*Mark only one oval.*

- We don’t manage our relationships.
- We manage our relationships on an ad-hoc basis.
- 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.
- We have defined programs to manage our relationships and both IT and the business comply with them.
- We have defined programs to manage our relationships, both IT and the business comply with them, and we are continuously improving them.

5. Perception of trust and value: The level in which there is mutual trust between business and IT departments within the organization

*Mark only one oval.*

- There is a sense of conflict and mistrust between IT and the business.
6. Reporting level business sponsor/champion: The level in which the relations with business partners are taken into account in IT planning

Mark only one oval.

- None
- Often have a senior level IT sponsor/champion only.
- Often have a senior level IT and business sponsor/champion at the functional unit level.
- Often have a senior level IT and business sponsor/champion at the corporate level.
- Often have a senior level IT and the CEO as the business/sponsor champion.

E. Scope and Architecture

Signifying the level of flexibility and transparency the IT is providing to business.

1. Traditional, enabler/driver, external: The level in which company wide IT standards are implemented

Mark only one oval.

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

2. IT standards articulation and compliance: The level in which the IT work processes are standardized. IT standards are:

Mark only one oval.

- None existent or not enforced.
- Defined and enforced at the functional unit level but not across different functional units.
- Defined and enforced at the functional unit level with emerging coordination across functional units.
- Defined and enforced across functional units.
- Defined and enforced across functional; Interenterprise standards

3. Degree of architectural integration. The components of our IT infrastructure are:
Mark only one oval.

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

4. Degree of architectural transparency, agility, flexibility: the level of disruption caused by business and IT changes (e.g., implementation of a new technology, business process, merger/acquisition). Most of the time, a business or IT change is:

Mark only one oval.

- Not readily transparent (very disruptive).
- Transparent at the functional level only.
- Transparent at the functional level and emerging across all remote, branch, and mobile locations.
- Transparent across the entire organization.
- Transparent across the organization and to our business partners/alliances; across the infrastructure.

F. Skills
The level of innovation, change readiness, hiring and retaining, and how they are contributing to the overall organizational effectiveness.

1. Degree of an innovation culture: When you come up with innovative ideas that you believe may enhance the business

Mark only one oval.

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

2. Locus of power: The important IT decisions are made by

Mark only one oval.

- In the hands of business executives at head office.
- Functional organization / Extended to the managers of subsidiaries / sites.
- Emerging across the organization / Extended to lower management.
- Across the organization / Dependent on the personality of staff.
All executives, including CIO and partners / Extended to all staff including IT.

3. Management style: My manager cares most about

*Mark only one oval.*

- Executing his/her instructions
- Consensus among our team
- Result
- Profit or value creation
- Maintaining our relationships internally and externally

4. Please rate the organization’s capability of change: How easy is it to do your daily tasks in a new way if you get the proper training?

*Mark only one oval.*

- Resistant to change / Very difficult
- Dependent on functional organization / Difficult
- Recognized need for change / Neutral
- High, focused / Easy
- High, focused / Very easy

5. Career crossover opportunities among IT and business personnel: In our company, staff has the flexibility to change their career path and get the needed training

*Mark only one oval.*

- None
- Minimum; To a certain level
- Dependent on functional organization; It varies among sites / subsidiaries
- Across the functional organization; within the same site / subsidiary
- Across the enterprise; across sites / subsidiaries

6. How education and cross training is facilitated in the organization:

*Mark only one oval.*

- None
- Minimum; Opportunities are dependent on the functional unit.
- Formal programs are practiced by all functional units.
- Formal programs are practiced by all functional units and across the enterprise.
- Opportunities are formally available across the enterprise and with business partners/alliances.
7. Social, political, trusting environment: The level in which the work environment is safe and reliable (The interpersonal interaction that exists across IT and business units).

*Mark only one oval.*

- There is minimum interaction between IT and business units.
- The association is primarily transactional style of relationship.
- Trust and confidence among IT and business is emerging.
- Trust and confidence among IT and business is achieved.
- Trust and confidence is extended to external customers and partners.