BUSINESS AND IT ALIGNMENT IN HIGHER EDUCATION SECTOR

HASSAN ALGHAMDI [1*], LILY SUN [2]

[1] College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia

[2] School of Systems Engineering, University of Reading, Reading, UK

Keywords:
Alignment
Business
Information Technology
Higher Education

Abstract. Business and IT alignment has been and continues to be a major challenge for researchers and practitioners. Although it has been studied for almost five decades, the complexity of this issue seems to be steadily increasing along with the rapid changes in the business and IT environments. This paper, through a critical review of the literature, aims first to provide an overview of business and IT alignment as a serious and challenging issue that faces business and IT managers in many public and private organisations today. It then discusses the importance of addressing this challenging issue in the higher education sector, which has received the lowest attention in business and IT alignment research compared with other public and private sectors. Finally, suggestions for possible future business and IT alignment research in the higher education sector are offered.

INTRODUCTION

Business and IT alignment is an important research topic [1], [2] that impacts on the strategic values of IT in organisations through an alignment between business and IT in practice [3]. The concept of alignment between business and IT has been deliberately discussed by researchers and practitioners under various terminologies, as shown in Table 1.

TABLE 1
VARIOUS EXISTING TERMS OF ALIGNMENT

Terminology	Authors
Balance	[1]
Fit	[4], [1]; [5]; [6]
Linkage	[7]
Fusion	[8]
Coordination	[9]
Integration	[10], [1]
Harmony	[11]
Bridge	[12]

[13] state that subtle differences may exist between different alignment terminologies. Nevertheless, the use of different terminologies to address IT alignment, along with a lack of coherent conceptualisation and measurement tools, has contributed to the growing family of alignment constructs [14]. This might have significantly contributed to the increased complexity involved in effectively addressing the phenomenon. Business and IT alignment can be defined from both a strategic and an operational perspective [1]. [15] consider strategic alignment as "the degree to which the IT mission, objectives, and plans support and are supported by the business mission, objectives, and plans". [14] state that this broad definition is one of the earliest sought in the field of alignment research and forms the basis for many alignment studies. Organisations that are able to strategically align their business and IT have been shown to perform better than their counterparts [16].

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*Corresponding author: Hassan Alghamdi

†Email: haalghamdi@bu.edu.sa

On the other hand, [17] define alignment at the operational level as "the degree to which IT applications, infrastructure and organisation enable and support the business strategy and processes". Operational alignment also known as functional alignment specifies how IT resources, including physical IT infrastructure capabilities and human IT skills, can leverage and support business needs [18]. Obtaining a holistic alignment at both levels is always advised if organisations are to be competitive and successful. It can also lead to potential benefits such as business agility improvement towards changes, greater operational efficiency and considerable savings in IT costs [19].

Over five decades, the alignment between business and IT has been an issue of considerable interest in both academic and practitioner literature [3]. The issue of achieving alignment between business and IT was first documented in the 1970s [20]. It has been continuously observed as a major concern to business and IT executives [11], [21]. Just a few years after its initial documentation, it was usually in the top ten IT management concerns from 1980 through 1994 [20]. This concern has been continuously revealed by a number of surveys conducted by the Society for Information Management (SIM) to determine the importance of multiple IT issues concerning IT managers in organisations. During the last decade, the alignment between business and IT was ranked most frequently as the number one concern among several IT issues [22]. In years when alignment was not considered as the first concern, it was ranked second three times in 2007, 2009 and 2012 and in third place just once, in 2010 [22]. The alignment between business requirements and IT capabilities therefore remains a noticeable area of concern.

The Focus of Existing Business and IT Alignment Research

The focus of the early research into business and IT alignment was mainly on the upper level of the alignment, including the planning level, the strategic level, relationship alignment among executive levels and so on [23], [24], . This can be observed by the continuous call for studies of functional fit between the business and IT structures, which can be defined as the operational alignment between business and IT [25], [17], [19].

Moreover, in terms of the assessment of alignment, many attempts have also been made to assess the alignment between business and IT at the strategic level [26], [27] with little focus on assessment at the operational level [17]. [28] argue that the operational level of an organisation has direct impacts on the organisation's overall performance, as the organisation's strategies and IT activities are all performed at this

level. There is thus a need for more research to investigate and evaluate the alignment between business and IT at the operational level.

The Impact of Business and IT Alignment on Organisational Performance

Although some research e.g. [27], [29], [30] indicates that there is no relationship between organisations alignment and business performance improvement, there is a general consensus amongst researchers and practitioners that alignment between business and IT has positive impacts on business performance [14], [19], [31], [32], [33], [34]. These studies revolve around the concept that organisations will perform better when their IT resources, including physical IT infrastructure, knowledge assets and both technical and managerial IT skills, are properly aligned with business strategy.

It is more critical now than ever to properly bridge the gaps between business requirements and IT capabilities due to the increased competiveness in the business environment [35]. [14], in a recent review of the business and IT alignment research, emphasise that in recent years, maintaining IT alignment is becoming more important than ever before, as misalignment could lead not only to a drop in organisations' performance, but also to an erosion in their agility and market competitiveness.

Business and IT Alignment Remains an Open Challenge

Serious efforts have been proposed by business and IT executives, consultants and researchers to address the alignment concern between business and IT since the 1970s [36], [37]. However, obtaining a proper alignment proves to be difficult, complex, challenging and sometimes chaotic [14], [38], [39]; [40]. It also remains an open challenge for the IS community [28]. Several reasons have contributed to its increasing complexity, including insufficient top management awareness of IT and its significant role in the organisation [41], [42] isolation in strategic and IS planning processes [41], [43] weak power of IT departments, and also some political, technical and financial constraints that hinder the implementation and use of new technologies [41]. The fast changes in both business and IT environments have also contributed to the increased difficulty of obtaining alignment between business and IT [24].

[20] argue that there are three main reasons that explain why attaining the alignment between business and IT has been so elusive. The exclusive focus on how the IT side should be aligned with the business side is the first reason, whereas the alignment should address how business and IT are aligned with each other, so that IT can drive as well as enable business

change. The second reason is that organisations have usually looked for answers from one angle to effectively align business with IT. These individual angles include: the right technology, effective communications between the business and IT, partnership, value measurements, governance and skills. All of these angles must be addressed simultaneously to improve the alignment between business and IT. The third reason why alignment has been so elusive is the absence of a prescriptive and descriptive tool that can not only help to gauge the maturity level of business and IT alignment, but also provide a road map on how to improve this alignment. Although these reasons have been published for almost a decade, they still seem to be relevant today.

[24] argue that although the concept of alignment in both academic and industry sectors is one of the most frequently studied concepts in the IS discipline, many organisations are still misaligned and fail to take full advantage of IT resources. As a result, these organisations, including higher education institutions, have adopted IT only as a back office supporter or on some occasions consider it as an expenditure instead of an enabler of business value [1], [44], [45].

Information Technology Alignment with Higher Education Institutions' Needs

Information Technology (IT) has the capacity to affect all aspects of academic and business needs in higher education institutions [46]. It has become obvious in recent years that reliance on information technology in the education sector has increased [47], [48], [49], with greater expansion of the IT role in teaching and learning activities during the last two decades [50]. Before that time, however, information systems in the higher education sector were mainly used for administration and communication activities [51]. The rapid technological advancements associated with the Internet, social networks and mobile computing have become crucial to boost and promote education [52].

This advancement of IT and its adoption in higher education continue to evolve [53]. For instance, the new Microsoft Hololens augmented reality technology is predicted to create new opportunities for education [54]. According to a recent study conducted by [55], augmented reality technology has proved its significance in assisting medical training and has already helped in actual medical procedures. Other opportunities and possibilities for adopting this technology and other recently developed technologies in education are constantly revealed.

This brings the need for universities to invest heavily in new advanced technologies to boost higher education teaching and learning processes [56]. According to a recent survey conducted by [57], 99% of 151 higher education institutions in the U.S. have invested in learning management systems (LMS). The survey shows that almost 75% of faculties consider these LMS as a very useful tool to enhance teaching. Students also show high levels of satisfaction towards the enhancement of their learning experience through the use of these systems. Such perceptions of students, staff and faculties can be considered as an important social factor that should be taken into consideration to assess the value of the alignment between business operations and IT systems in higher education institutions.

Today, the failure in such learning management systems and student management systems in higher education institutions might have significant negative impacts on students' satisfaction, institutions' reputation and future revenues [58]. Therefore, if these technologies are to add value to educational activities, they have to be continuously evaluated and aligned with the needs of students and academic staff. Likewise, technologies used by employees in different departments and schools at higher education institutions have to be aligned with the institutional objectives to add business value.

What Makes Business and IT Alignment Different in the Higher Education Sector?

The idiosyncratic nature of higher education, represented in shared decision-making, different organisational culture among colleges and universities and the independence of academic courses and research activities, presents a unique IT alignment challenge with institutional objectives and priorities [59]. [20], through the adoption of the Strategic Alignment Maturity Model that was developed by [60], find the education sector to be the least mature sector in terms of strategic business and IT alignment compared with many other industry sectors such as transportation, insurance and health. Therefore, more focus has to be given to the higher education sector to explore the challenges and obstacles that prevent higher education institutions from achieving a more mature level of alignment between business and IT.

In recent years, the evolution of digital technology has motivated much of the calling for integration of information technology and business strategy in the field of education. This has led many higher education institutions to quickly adopt advanced technologies, often even prior to the time when their value to education is proven. According to [61], the expected benefits from information technology adoption in higher education institutions are not usually delivered. In fact, systematic technological enhancement planning is harder when certain

rapid and unpredictable changes occur in technology. Academic planners are thus continually playing catch-up to implement advanced applications of technology which appear more rapidly. According to [62], the planning of IT in a higher education environment is a difficult task, as a technology can become obsolete within three years. In higher education settings, a number of technology options have been underutilised or totally unused due to limited user acceptance [63], [64]. Therefore, a robust evaluation mechanism that can be used to determine when and whether these technology options can become obsolete, taking into consideration the intangible social perceptions of users from an alignment point of view, is still missing. According to [61], the assessment of technology opportunities within educational institutions must be conducted against the needs of the various associated stakeholders. However, different key stakeholders in higher education institutions, including academic staff and students, may have different perceptions about technology, which makes the management of technology resources in the higher education context more complex. Regardless of this complexity, understanding the key stakeholders' expectations and needs is essential to ensure the successful management of technology resources in higher education.

According to a report published by the U.S. Department of Education in 2006, the mission to align technology in higher education institutions is one of the most challenging issues facing this sector [65], [74]. Nevertheless, there is a scarcity of IT alignment research that takes the higher education context into consideration, as discussed next.

The Lack of Rigorous Practical IT Alignment Research in Higher Education Sector

The majority of strategic alignment studies identified in the IT alignment literature were developed and evaluated within private institutions [66], although the issue of alignment is a concern for both private and public institutions. For instance, [67] investigated the banking industry in order to evaluate the strategic alignment between business and IT. [68] have studied the health sector and found that conflicting priorities and challenging budgetary pressures are among the major dilemmas that are experienced by many health information systems. [69] studied the automobile sector to generate system requirements by modelling business processes. However, they argue [24] that the higher education sector has not been given proper consideration. In another recent review study, [3] reviewed different sectors that were covered by alignment cases and found that educational institutions have received the lowest attention compared to any other public sector.

The complexity of managing IT technologies in the higher education context might appear to be one of the reasons behind the lack of IT alignment research in the higher education sector. According to [61], managing IT technology in higher education institutions is not an easy initiative due to the fact that this IT management process in such an idiosyncratic environment is under-researched. [59] state that although the value added by IT to business in higher education has been realised, it has not been effectively assessed. One of the main reasons is that return on IT investments in higher education institutions is largely unmeasured [70]. However, the main challenge in assessing the alignment between business operations and IT resources can be ascribed to the absence of a comprehensive and reliable mechanism that can be used for the evaluation process.

[71] argues that a better way to describe and measure the alignment between business and IT is still required and that the focus should not be on performance indicators, which usually lack practicality, but on measurable goals such as customer satisfaction and business value. [72] argue that although many practical methodologies for assessing the business and IT alignment can be found in the IT alignment literature, they have different approaches to assessment, which makes it difficult to agree on a universal methodological approach for assessing the alignment of the business and IT. [24] similarly argue that although there are numerous alignment methodologies, they are mostly ad hoc, and new alignment methodologies are still required that define a proper link between business and IT to ensure sustainable strong alignment.

In recent years, the higher education sector is similar to many other industrial sectors in that it operates under enormous pressure to reduce costs and improve outcomes [73]. Improving outcomes and being financially efficient can be attained via information technology capabilities if they are properly utilised to do so [73]. However, there is high demand for business and IT alignment research that specifically takes the higher education sector into account because of its idiosyncratic nature. This would provide in-depth understanding of this alignment challenge in this important sector. A conclusion to this brief review paper is drawn next, along with suggestions for some possible business and IT alignment research in higher education context.

CONCLUSION AND FUTURE RESEARCH

Business and IT alignment has been intensively studied for almost five decades as a major concern that faces the Information Systems community. As a result, a variety of definitions, challenges and phases of alignment have been highli-

ghted and discussed. Different sectors have also been examined to address this phenomenon, including public and private organisations. However, the educational sector has received the lowest attention, although it is considered as a front-line partner to all other industrial sectors. An overview of the issue of business and IT alignment is provided in this paper, with particular emphasis on the importance of addressing this phenomenon in the higher education sector. Future business and IT alignment research that takes the higher education context into consideration is still required.

First, there is a need for a strategic alignment model that can be used by decision-makers in higher education institutions to assist in integrating and aligning IT with institutional objectives. The maturity of strategic business and IT alignment in higher education institutions can also be re-assessed by using [60] Strategic Alignment Maturity model to determine the current maturity level of the alignment between business and IT and compare it with the findings published by [20]. This maturity evaluation would highlight those areas in the higher education sector that still require more attention to increase the level of strategic alignment maturity between business and IT.

In addition, a measurement tool that can be used to assess the alignment at the operational level between existing IT capabilities and business needs is also required in the higher education sector. This measurement tool should consider both tangible and intangible factors of the business and IT elements, such as staff and students' perceptions towards IT systems, to ensure more reliable outcomes regarding the value of the alignment between business and IT. This could then illustrate

whether a satisfactory level of support is being provided by existing IT capabilities in the institution or on the other hand allow for significant recommendations of changes to be drawn to optimise the business value of IT capabilities. The development of such a comprehensive methodological approach to assess the alignment between business operations and IT capabilities at the operational level of higher education institutions is under investigation by the authors of this paper at the present time.

Finally, extant business and IT alignment research focuses on the alignment issues within individual organisations. [14] point out that future research on business and IT alignment will need to move away from a singular organisation point of view to focus more on how IT platforms support or might on some occasions hinder the co-creation of business value in innovation ecosystems. Taking into account this transformation in the business environment, new IT alignment research should begin to place more emphasis on how to enhance operational competencies to enable effective participation in such ecosystems. The educational ecosystem is an example, as hundreds of colleges and universities worldwide are now jointly offering courses on the Internet [47]. Therefore, more IT alignment research has to be devoted to this area to help higher education institutions to effectively engage in an integrated, distributed and pervasive network of local and global educational ecosystems to enable them to mutually co-operate with different customers and partners by exchanging competencies such as services and knowledge to co-create value.

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