Strategic Alignment between business unit and IT (Information Technology) in companies: A systematic mapping

Alinhamento Estratégico entre Unidades de Negócios e TI (Tecnologia da Informação) nas organizações: Um mapeamento sistemático

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Abstract: The strategic alignment between business units (BU) with information and communication technology (IT) has been widely discussed in corporate organizations as a key issue by directors and managers in organizations that operate in various segments to support processes and optimize organizational performance. However, there still few organizations that benefit from all the benefits of this alignment. Although there are several models of strategic alignment between the BU and IT that have validated best practices and proven results internationally by various organizations, this is still a challenge faced by several CIO (Chief Information Officer) and by science. This article proposed to carry out a systematic study of the literature with a literature mapping study to determine the critical factors influencing the context of strategic alignment between the BU and IT.

Resumo:O alinhamento estratégico das unidades de negócios (BU) com a tecnologia da informação e comunicação (TI) tem sido amplamente discutido nas organizações corporativas como uma questão fundamental por diretores e gerentes em organizações que atuam em diversos segmentos para apoiar processos e otimizar o desempenho organizacional. No entanto, ainda são poucas as organizações que se beneficiam de todos os benefícios desse alinhamento. Embora existam diversos modelos de alinhamento estratégico entre BU e TI que têm validado as melhores práticas e resultados comprovados internacionalmente por diversas organizações, este ainda é um desafio enfrentado por vários CIOs (Chief Information Officer) e pela ciência. Este artigo se propôs a realizar um estudo sistemático da literatura com um estudo de mapeamento da literatura para determinar os fatores críticos que influenciam o contexto de alinhamento estratégico entre a UN e a TI.

Keywords: Strategic alignment. IT governance. Strategic alignment model. Information technology. Business unit.

1 Introduction

Organizations have understood the need to apply IT as a critical success factor in their strategic planning. Seeking to ensure optimization of its internal and external processes, improving sustainability and productivity, creating services and products, and increasing the quality of service and product delivery to its customers. This challenge has become exponentially complex due to the digital nowadays. To ensure Return of Investments (ROI) that are made in IT in accordance with the objectives established in the strategic plans, organizations want there to be an alignment between the BU and IT. This concern of organizations is old, given the publication of the strategic alignment model (SAM) of Henderson and Venkatraman (HENDERSON; VENKATRAMAN, 1993) describing how the organization can carry out this alignment to have governance over business assets and technology, generating efficiency before the organization's strategic planning.

However, there is still a concern at the academic and industry level about how to implement a model that meets the needs in the context of the organization, mainly due to the complexity in a digital market. Where IT has become a critical success path for organizations and even many organizations only exits because of IT, as is the case with purely digital companies. This problem is addressed through information technology governance (ITG), which aims to manage IT risks and how to generate value for the business. In a world with increasingly digital consumers, strategic agility, and governance with the application of the correct strategic alignment model between the BU and IT is essential to build the organization's competitive capacity and generate value in the market in which it operates.

The overall research questions we aim to answer are the following:

RQ1: What is there about strategic business alignment model in the context of information technology?

RQ2: What are the main reported benefits of strategic business alignment model in the context of information technology?

RQ3: What are issues related to strategic business alignment model in context of information technology?

We answered the research questions by conducting a mapping study in the research literature of strategic alignment between BU and IT in organizations. This article is structured as follows: Section II presents a theoretical framework on the definition of business unit (BU), fundamentals of information and communication technology (IT), fundamentals of strategic alignment (SA), alignment model strategic (SAM) and information technology governance (ITG). Section III presents the final considerations with lessons learned.

2 Theorethical background

2.1 Business unit definition

To better understand the organizational context and its structures, it is important to conceptualize what the business units (BU) are, or also called the business area (BA). Basically, it can be seen as a “planning unit” defined according to organizational strategic needs and opportunities. Some authors extend this concept to the operational level, conceptualizing the BU in the conception of the term, with all the resulting implications, such as autonomy of strategic operational management of directed operations and others (SLACK, 1993).

Also in the concept of the BU adopted by GE - General Electric (BUZZELL; GALE, 1991) "A business unit is a division, product line or other profit center of a company.", which in turn has as its main objective to generate a product, service or value aligned with the organizational strategic plan. We can define that a BU represents an elementary business unit of a company or organization and that it’s part of an organizational ecosystem.

2.2 Fundamental of Information and communication technology (IT)

Given the various evolutions that humanity has been going through, we can highlight the current revolution regarding information technology, processing, and communication. We’re living in the information age, and this is easy to see when we see quick access to any type of information. We can define that IT is directly related to the components of software, hardware, people, and processes that any physical or legal organization needs to achieve its organizational goals (LAUDON, K.; LAUDON, J., 2014). The context of these components is defined as Information Systems (IS).

2.3 Fundamentals of strategic alignment

The strategic alignment between the BUs is one of the main challenges faced by all organizations and for science nowadays (ITGI, 2003). This’s how the integration of the organizational ecosystem is carried out so that the business value expected by strategic planning is generated. The challenges are how to find the best alignment model that will serve the organization, considering three dimensions: architecture, governance, and communication.

2.4 Strategic alignment model (SAM)

Technology in organizations has undergone profound transformation in recent decades. Its role has gone from being a mere provider of systems and software to actively

participating in organizational strategic management. With the role of leveraging technological innovation and generating new business, the technology area needed to remodel itself to meet this new demand, mainly by implementing a model of integration and communication with the entire organization. So that its role was aligned with the organizational strategic plan [1].

In order to overcome this challenge of integration, communication and relationship between IT and the BU, Henderson and Venkatraman developed a model of strategic alignment knowledge as SAM, which is based on two fundamental pillars: strategic fit and integration functional and in four perspectives: business strategy, IT strategy, organizational infrastructure and business processes and infrastructure, and finally IT process [1].

Henderson and Venkatraman's SAM model has two basic premises, they are: economic performance that is directly linked to the ability to manage resources and strategic adequacy understood as a continuous process of adaptation and change [1].

2.5 Information technology governance (ITG)

According to the IT Governance Institute (ITGI), IT Governance (ITG) is the responsibility of the members of management and senior management. ITG is part of the organization's management process and basically consists of the management of all components, process and structures to ensure effective IT results, supporting the organization's strategic initiatives. These processes are mature and internationally established, through the international standard ISO/IEC 38500:2015, which provides principles and processes that directors and those responsible for governance should be guided and followed. These principles set out: responsibilities, strategies, IT acquisitions, performance, compliance and human conduct (CALDER, 2008).

3 Methods and procedures

This systematic literature review (SLR) has been conducted by following the guidelines of Barbara Kitchenham (KITCHENHAM; DYBA; JORGENSEN, 2004) to find the objectives were identified and their corresponding research questions were formulated.

3.1 Data sources

To find relevant literature to answer the research questions four databases and indexing systems were selected and used for this study as follows:

- **SCOPUS (scopus.com)**
- **Web Of Science (webofscience.com)**

- **Science Direct (sciencedirect.com)**
- **ACM Digital Library (dl.acm.org)**

These online databases and indexing systems were chosen by authors, given that they are among the most relevant sources of articles within the broad field of computing science and because they are accessible using institutional accounts.

3.2 Search strategy

The SLR is a systematic and auditable scientific method that allows secondary studies to be carried out for a variety of research questions using the concepts of evidence-based software engineering [7]. When conducting a literature search it is imperative to establish a search strategy to find relevant search results. After defining the information and research criteria based on research questions, the keywords for the research questions were extracted and then the search query was formulated as follows:

("strategic alignment model" OR "strategic alignment" OR "strategic model" OR "alignment model") AND ("information technology" OR "IT")

This search string was adapted and applied in the several databases listed in the previous section and the date range between 2016 and 2021 (five years) was defined to find the actual relevant research. We also tried different synonyms providing same results. Table 1 summarizes the search strategy and criteria:

Table 1. Research strategy and criteria

Search string	Digital Libraries	Results
("strategic alignment model" OR "strategic alignment" OR "strategic model" OR "alignment model") AND ("information technology" OR "IT")	Scopus	659
("strategic alignment model" OR "strategic alignment" OR "strategic model" OR "alignment model") AND ("information technology" OR "IT")	ACM	12
("strategic alignment model" OR "strategic alignment" OR "strategic model" OR "alignment model") AND ("information technology" OR "IT")	Science Direct	8
("strategic alignment model" OR "strategic alignment" OR "strategic model" OR "alignment model") AND ("information technology" OR "IT")	Web of Science	378

Source: author himself

3.3 Selection criteria

After conducting the research on each platform, the results of different research were consolidated, and 1057 articles were submitted for an initial quality screening in line with the research context. Starting by sorting by the titles of the articles and then title and abstract the articles to the level that adherent to the research context. The Cadima Software was used to execute the SRL ("CADIMA", [s.d.]). The process of selecting relevant primary studies began with the definition of the final search query which was executed in the selected academic databases. The resulting articles were then read and filtered according to the inclusion and exclusion criteria. The approved articles were checked for duplicates and their references were analyzed to identify studies that could have been overlooked in the initial search. The following criteria defined for this stage of screening the articles that will be considered according to the next steps:

A. Inclusion criteria:

- **QI1:** Papers that discussed the benefits of IT-Business strategic alignment model.
- **QI2:** Papers that discussed IT-Business strategic.
- **QI3:** Papers that are focused on the challenges of adopting IT-Business alignment models.
- **QI4:** Papers that are accessible.
- **QI5:** Papers that are published between 2016 and 2021.
- **QI6:** Papers that are published in english.

B. Exclusion criteria:

- **QE1:** Papers that do not contextually discuss IT-Business strategic alignment.
- **QE2:** Papers that do not capture relevant keywords of IT, Business Alignment, Strategic Alignment and Alignment Model.
- **QE3:** Papers that yours full text are inaccessible.
- **QE4:** Papers that are published before 2016.

3.4 Quality assessment

After selecting relevant papers, we performed the quality assessment using the same criteria of the Original Study. Since some criteria apply only to empirical studies, while others apply to theorical study, the final score was normalized by recording only the percentage of the maximum possible score for that paper to enable comparison. In table 2 we defined the structure to help answering the quality criteria.

Table 2. Quality Criteria

Assessment Criteria	Response Options for Score
Is there a clear title and abstract?	Yes = 1/ No = 0
Is there a clear keyword?	Yes = 1/ No = 0
Is there a clear statement of the aims of the research?	Yes = 1/ No = 0
Is the context in which the research was carried out adequately described?	Yes = 1/ No = 0
Was the research design appropriate to the aims of the research?	Yes = 1/ No = 0
Was the data collected in a way that addressed the research issue?	Yes = 1/ No = 0
Was the data analysis sufficiently rigorous?	Yes = 1/ No = 0
Is there a clear statement of findings?	Yes = 1/ No = 0
Were the limitation of the study reported?	Yes = 1/ No = 0

Source: author himself

3.5Analysis and synthesis

Retrieved papers were collected which academic database and imported in Zotero reference manager tool. After we exported the BibTex file to import in Cadima Software to execute the SRL. The Cadima Software was a valid mean to classify qualitative and quantitative data needed to answer the three research questions defined earlier in this study.

3.6Validity Threats

The main threats to the validity of this study include the inclusion and exclusion criteria and limited keywords used in the query design. The Research String (RS) was formulated with the research questions in mind. That way there are chances of losing some relevant part. To mitigate this threat, we use snowballing so as not to miss any relevant studies that the query may not have previously identified.

4 Results

4.1 Overview of the selected literature

Applying the Search String selected to carry out this work, without applying the search criteria, we reach the following results as shown in Table 3 with potentially relevant articles.

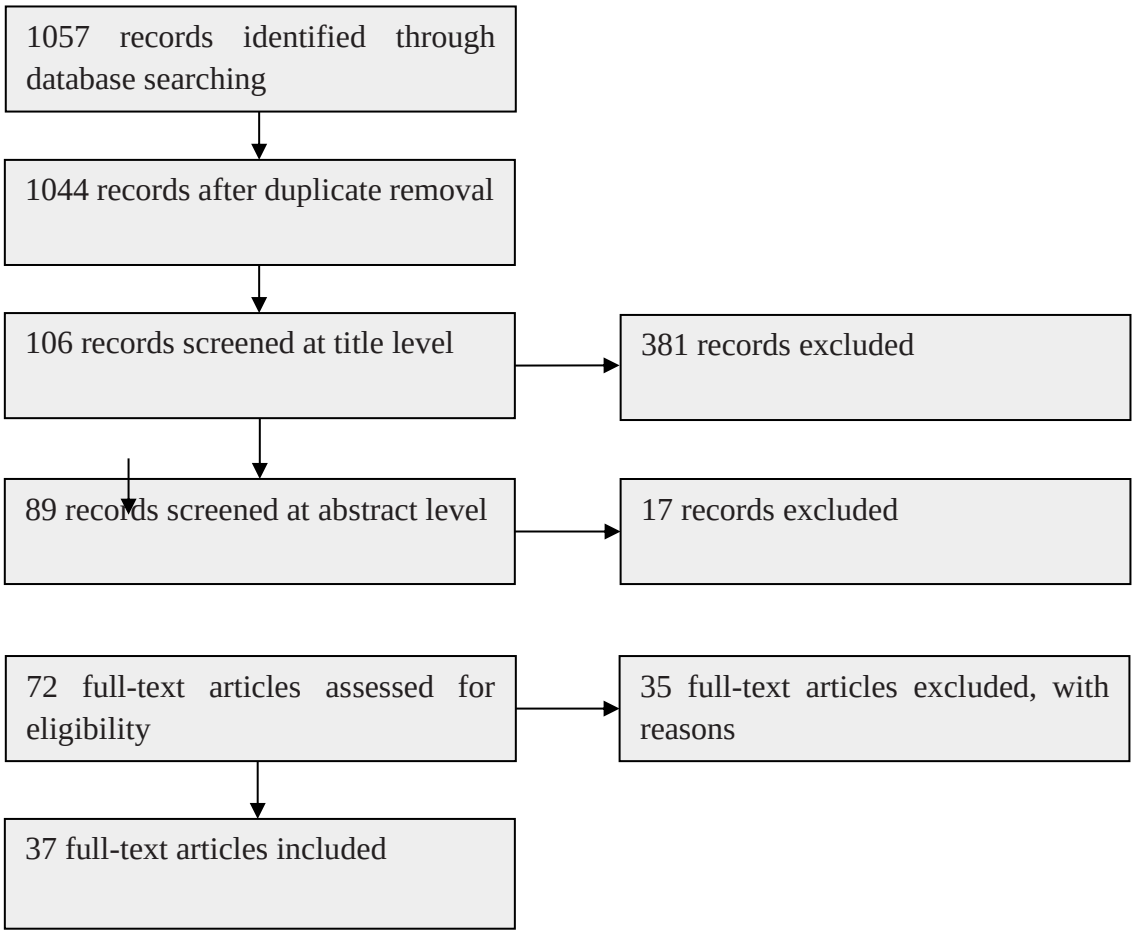
Table 3. Potentially Relevant Papers

Database	Articles	Potentially Relevant	Selected
Scopus	**659**	**655**	**32**
ACM DL	**12**	**10**	**2**
Science Direct	**8**	**1**	**1**
Web of Science	**378**	**378**	**2**
Total	**1057**	**1044**	**37**
Search precision	**(100%)**	**(98,77%)**	**(3,50%)**

Source: author himself

In order, to plan and execute this research review, we took a subgroup of steps of the original study. A comprehensive exhaustive search for primary studies was carried out, based on automated and manual search; the selected studies were assessed regarding the quality of their evidence; data needed to answer the research question(s) were extracted and classified. The results were finally summarized and synthetized. Figure 1 illustrates the review steps, and further details are given in the following sections.

Figure 1: Review steps



Source: author himself

To assure efficacy for the search string, as well as compatibility to the original study search, we adopted three strategies: first, since our string brought all result all years founded, we looked in our result for the papers published that was relevant. All four papers were retrieved; second, we previously selected a set of six papers, published and considered that these papers should be returned from our searches. Third, we run our string again, with no time restrictions, and we investigated our results for a primary study from the original study. This strategy was applied which digital libraries described in (Table 1).

4.2Research question 1: What is there about strategic business alignment model in the context of information technology?

It is possible to observe in our research there are several models have been proposed to explain how alignment between business unit and IT can be achieved and sustained. Faced with complex scenarios and markets, there are a variety of business contexts, for this there

are many alignments model, but there is on that stands out. Strategic Alignment Model (SAM) (HENDERSON; VENKATRAMAN, 1993) presented earlier. This main model applied in many business contexts. This model relies on four different strategic domains: the business strategy, organizational infrastructure and process, IT strategy, and IT infrastructure and process. It is also based on two building blocks: strategic fit and functional integration and within each block, there're the external and internal domains [13]

4.3Research question 2: What are the main reported benefits of strategic business alignment model in the context of information technology?

In what follows, the main benefits of strategic business alignment model in the context of information technology are reported.

Collaboration and Cooperation: collaboration and cooperation refer to the teamwork and shared domain knowledge and common understating between the business and IT always about a specific business process and how IT can be used to improve the performance of that process and beyond how IT can do a digital transformation. In short words, shared IT-Business understanding enables the organization to conceive, implement, and use innovative IT applications to improve enterprise process performance.

Competitive Advantage: the competitive advantage refers to an edge a company has over its competitors. Apply an alignment of IT and business strategy is very important to achieve company goals. It is clear that business and IT performance are tightly coupled, and company cannot be competitive if their business and IT strategies aren't aligned. In this scenery the Level C have a great role in the alignment of IT and Business strategy.

Higher return on strategic investment: Apply an alignment of IT and business strategy has shown to improve return on investment, time efficiency, cost saving, and a lot of things.

4.4Research question 3: What are issues related to strategic business alignment model in context of information technology?

In what follows, the main issues related to failure in applying strategic alignment model in context of information technology.

The failure of IT to provide benefits to the organization: even in the digital age it's still possible to see many organizations that have a problematic IT department and misaligned the organization's strategy. Expensive and delayed projects, misaligned strategies. Frustration and loss of performance.

Thinking that IT is an expense and not an investment: Many business executives still think that IT is an expense rather than an investment that can enhance an organization's competitive ability. This thought is due to the absence or error in the application of a correct strategic alignment model between IT and business unit.

5 Conclusions

Nowadays, it's possible to observe a complex business environment. Variables such as economics, politics, pandemics, global challenges, and the digital world made companies depend on digital solutions. IT is the provider of solutions that will enable organizations to become more competitive and sustainable. You can no longer think about reactive IT. IT is strategic and as such it needs to be aligned side by side with the business unit. Apply the correct alignment strategic model between IT and business unit it's a critical success factor for any organization.

6 Final Considerations

It was possible to observe in several research that research motivations and questions are always limited to specific points of view with a business view and there is no care in deepening with a view of engineering and software processes. Access to reputable repositories that bring together cutting-edge research and high scientific quality was extremely effective in carrying out this work.

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