Influence of Organizational Structure on Business-IT Alignment: What We Do (Not) Know

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Abstract. Despite the long list of cumulative research on business-IT alignment, researchers and practitioners argue that it remains to be evasive. On the other hand, business-IT alignment is found to be associated with improved overall organizational performance. As today's organizations continue to spend a significant amount of their resources on IT to improve the variety and quality of services, achieving and maintaining business-IT alignment is a timely issue that needs to be addressed. Studies indicate that organizational structure, among other factors, plays an important role on whether organizations succeed in achieving business-IT alignment. A systematic literature is conducted to provide an overview of previous studies as well as point out possible future research directions. Databases indexing reputable journals and conference proceedings in the information systems research domain were searched. A total of 21 articles were identified and included in the review. The findings indicate that there are few studies poised to address the lack of knowledge on how the formal/informal organizational structures influence business-IT alignment. Empirical studies are needed to settle the debate on which types of organizational structures contribute to achieving business-IT alignment in today's organizations. The study presents summary of previous findings and proposes potential future research directions.

Keywords: Business-IT Alignment, Organizational Structure, Formal Organization Structure, Informal Organization Structure, Literature Review.

1 Introduction

Business-IT alignment, the application of IT to further business strategies, goals and needs in appropriate, timely and harmonious manner [1], remains to be one of the evasive issues for both researchers and practitioners in the information systems research domain. The continuous attention rendered by scholars since the mid-1980s is justified given the empirical evidences that established the strong relationships between business-IT alignment and overall organizational performance [2,3,4]. Surveys carried out among IT executives in different countries across industries have also revealed that business-IT alignment was consistently ranked at the top of the list of concerns for many years in a row [5]. Studies have shown that achieving and maintaining business-IT alignment is still important for organizations as IT continues to change the way they

run their activities and organize business processes, communicate with customers and deliver their services [6].

The authors of [7] and [8] argue that the business-IT alignment literature remains to be too conceptual not reflecting the actual problems faced by today's organizations. However, there is a consensus among researchers that the success of organizations to achieve and maintain business-IT alignment is the function of how IT as well as the different organizational factors are coordinated and fit together. As [1] put it, it is on the best interest of organizations to spend their resources and focus on maximizing the enablers of business-IT alignment while minimizing the inhibitors. Among the different factors affecting business-IT alignment, several studies [9, 10, 11, 12] have confirmed the importance of both formal and informal organizational structures.

2   Organizational Structure

In organizational theory literature, organizational structure—also known as formal organizational structure sanctioned by the leaders of an organization—is described as an institutional configuration or arrangement outlining the division of labor in a rational and conscious manner [13]. This is in line with what Weber [14] referred as a form of bureaucracy which is necessary for organizations as their objective is to make sure that no functional division is overlapped with the help of hierarchical coordination and control. To make sure the organizational structure works properly and efficiency is warranted, rules and procedures, roles, positions as well as social relationships are formalized. Communication among members is impersonalized. In the IS literature, organizational structure is conceptualized in terms of centralization, and formalization [15, 8].

On the other hand, a different organizational structure is identified by many scholars in the management discipline. For instance, the work by [16, 17] indicate that a different organizational structure—described as informal organization—is prevalent in organizations. Diefenbach et al. [18] characterize the informal organization structure as a mechanism that is made possible through social and interpersonal guidelines. This structure differs from the formal organizational structure not only because it is a diversion from the official system rule, but also as it emerges and develops through times from social interaction that is repeated for extended period of time. Authors within the information systems domain also defined the informal organizational structure as arrangements deviating from the formal organizational structure such as social networks, communities of practice, cross department relationships, interpersonal relationships, unofficial agreed-on processes, and flexible division of work [9]. In some studies, a culture of an organization is also considered to constitute an informal organizational structure [19, 20].

2.1 The Role of Organizational Structure on Business-IT Alignment

The role of organizational structure on the efficient use of information systems in general, and how it affects the alignment between business and IT has long been the focus of research [9, 21, 22, 15]. Empirical evidences suggest that organizations with appropriate organizational structure are more apt to implement the strategies which makes it possible to benefit from business-IT aligned position. However, there is still little known about how different organizational structures influence business-IT alignment [9, 23, 3]. The continuously changing business environment and the organizations attempt to respond by continuously improving the complexity of their structure has been citing as one of the source of the problem [9]. On the other hand, the extant literature presents contradictory findings on which types of organizational structure have the greatest favorable impact on business IT-alignment, for instance [9, 24, 25]. Given the significance of business-IT alignment for both practice and research, the aim of this study is to determine what we currently know about the role that organizational structures play on business-IT alignment as well as propose potential future research directions.

In the next section, the detailed research method is presented. In the subsequent section, the results of the review will be discussed according to the research questions. The last section presents the conclusions that provide a summary of the main findings and suggestions for future research.

3 Research Method

This study is conducted through a systematic literature review [26, 27], a research method which is used to collect, appraise, categorize and analyze previous studies. Systematic reviews are invaluable in presenting extant knowledge as well as pointing to the potential future research directions [28]. The research questions that are used to guide in the selection of articles as well as the literature search procedure and the method of analysis of the selected articles are presented in the following sub-sections.

3.1 Research Questions

The following two research questions are used to help the structuring of the analysis and the presentation of the findings of the literature review.

RQ1: What are the research goals of the business-IT alignment studies focusing on organizational structure?
RQ2: Which research designs are used?
RQ3: What are the main findings?

3.2 The Literature Search Process

The literature search was carried out following the structured methodology guidelines as suggested by [26, 27, 29]. Only peer-reviewed journal as well as conference proceedings of reputable quality were targeted.

The search for literature started with all databases known to index the eight IS Senior Scholars' basket of journals. Direct phrase search with the help of combination of different keywords was done to identify relevant articles published in these journals. A study [29] argues that articles published in reputable journals of specific area of specialization are most likely to contribute significantly to the field of a particular study. Apart from these reputable journals in the Information Systems research area, databases indexing reputable conference proceedings (AMCIS, ECIS, HICCS, ICIS, PACIS) were also searched as they are known to publish reputable quality of articles. Even though there might be relevant studies published in book chapters as well as practitioner journals, the review is limited only to the journals and proceedings mentioned above. Recent literature review articles [3, 4, 10, 30] on business-IT alignment were read to identify studies that might be relevant but not caught in the search [7]. In order to identify relevant studies published elsewhere, a backward search was conducted—by manually scanning the list of references [29]. A forward search was also carried out using Google Scholar to determine whether the articles that cite the previously identified articles are relevant for the literature review.

Since the conceptualization and definitions of business-IT alignment has been different in the academic literature [3], the use of a combination of different keywords was deemed necessary to capture all relevant literature for review. Table 1 shows the combinations of keywords used.

Table 1. combinations of keywords used in the search of literature

"business-IT	"alignment"	"organizational"	
"business-information technology"		"organizational"	"structure"
"business-IS"		"organization"	
"business-information systems"		"organization"	
"IT alignment"			
"business-technology alignment"			

The screen for relevant articles was done in three steps. There were a total of 298 articles that were retrieved using the combination of keywords. After duplicates were removed, all the titles and keywords of the remaining 163 articles were manually scanned. The second evaluation of the relevance of the articles was made by reading the abstract of the articles using the inclusion and exclusion criteria indicated in Table 2.

Table 2. Inclusion and exclusion criteria used to evaluate the articles selected for the review

Inclusion Criteria	Exclusion Criteria
Complete research articles focusing on organizational structure in relation to business-IT alignment	Research-in-progress articles
	Not peer-reviewed articles
	Book chapters
	Duplicate articles
	Literature reviews

The second evaluation reduced the number of articles to 37. The articles that were found to be within the scope of the research topic were selected for the third-round of evaluation. In this stage, the full texts of the identified articles were scanned in order to determine if there are inconsistencies between the abstract and the articles 'full content.

Table 3. List of Journals and Conference Proceedings

Journal/Conference Proceeding	Articles
Business Process Management Journal	[33]
Communications of the Association for Information Systems	[19]
Decision Sciences	[35]
European Conference on Information Systems	[8, 25, 36]
European Journal of Information Systems	[15]
Hawaii International Conference on System Sciences	[38]
IBM Systems Journal	[39]
Information and Management	[31]
Information Systems Research	[20, 24]
International Journal of Information Management	[21]
Journal of Enterprise Information Management	[40]
Journal of Information Technology	[2]
Journal of Management Information Systems	[34, 41]
Journal of Systems and Information Technology	[37]
MIS Quarterly	[22, 32]
MIS Quarterly Executive	[9]

The final list of articles contains 21 studies that are confirmed to meet the objective of the research. The final evaluation of the full content of the articles was done according to the same inclusion/exclusion criteria. Table 3 presents the list of journals and conference proceedings that published the articles included in the review.

3.3　Data Extraction and Analysis Method

Despite the large volume of studies on business-IT alignment, the search for literature has resulted in the identification of only 21 relevant articles for this review. The data for analysis is extracted manually and exported to an excel file. From each of the articles selected, the following data was extracted: publication (journal, conference proceeding), authors, research strategy and research method (data collection, participants, and data analysis), theories and frameworks used, main research concepts, research questions/hypotheses/objectives, findings, and conclusions. A thematic analysis was made according to the research questions.

4　Results

This section presents the results of the analysis of the reviewed articles according to the research questions formulated for the review.

4.1　What are the research goals of the business-IT alignment studies on organizational structure?

Previous studies have shown that the business-IT alignment literature is dominated by theoretical debates rather than empirical investigations of antecedents of business-IT alignment [3, 7, 30]. A closer look into the goals of the identified studies reveal that the main objectives of the studies fall under two categories. The first set of studies explored the relationship between organizational structure and business-IT alignment together with various determinants that need to be taken into consideration when decisions on organizational structure are made. The rest of studies attempted to propose models/frameworks to be used to better understand organizational structures and how they influence business-IT alignment (see Table 4).

Table 4. Articles categorized according to research goals

Research Goals	Count	Articles
Exploratory/understanding	16	[3, 8, 15, 19, 21, 22, 24-25, 31-38]
Models/frameworks	5	[2, 20, 39-41]

Exploratory Studies
Exploratory studies on organizational structures and business-IT alignment have attempted to identify which of the available structures are appropriate to achieve and maintain business-IT alignment. Few empirical studies have attempted to find out if leaders are moving toward specific organizational types within their industries in an attempt to propose if the most preferred structure improves business-IT alignment [21]. Others introduced variables to look deeper on the role of organizational structures. For instance, studies by [9, 33] investigated not only how different organizational structures

resulted in business-IT alignment but also whether the observed business-IT alignments have improved the performance of organizations. There are also authors which focused on business-IT alignment at specific levels and how it could be influenced by organizational structure. For instance, the work by [24] attempted to find out whether informal organizational structure has more influence on business-IT alignment at the strategic level.

Models/Frameworks
The analysis of the articles reviewed shows that 5 out of the 21 studies proposed different models that could help organizations design organizational structure to achieve business-IT alignment. Both formal organizational structure [39] and informal organizational structure [40] have been included in the model. However, authors [2], on the other hand, argue that the emphasis given to the importance of the formal organizational structure on business-IT alignment did not benefit today's organizations and propose a coevolution framework that put equal weight on both formal and informal organizational structure. Another study [20] proposed a model depicting business-IT in organizations based on unit analysis of sub-cultures within the same organization. Another model by [32] attempted to show patterns of antecedents which explain various organizational structure design decisions. On the other hand, [38] explored different components to propose set of guidelines on how circular organisational structure could be designed to accomplish sustainable business-IT alignment.

4.2 Which research designs are used?

Literature has indicated that there is a lack of business-IT alignment research that are grounded with empirical evidences to produce descriptive/prescriptive steps which may contribute to the practice [30]. One of the reasons for the disproportionate attention to conceptualization of business-IT alignment in the information systems literature [7] is the fact that the debate within the discipline relied on models/frameworks that do not reflect the 'real world experience'.

Table 5. Articles categorized according to research design

Research Design		Count	Articles
Conceptual studies		3	[2, 22, 41]
Empirical studies	Case studies	8	[9, 19-20, 25, 36-39]
	Survey	7	[8, 15, 21, 24, 31, 33-34]
	Grounded theory	1	[40]
	Mixed	2	[32, 35]

In order to have an overview of the research methods used, the analysis of the research design of the studies included in the review are categorized according to the scheme suggested by [42]. The articles under the conceptual category used findings of previous

studies as well as theoretical frameworks to draw theories or propose models and frameworks. The remaining articles articles are placed under the category of empirical studies. These studies are the ones conducted using case study, survey, grounded theory and mixed research strategies. In order to have an overview of conceptual and empirical studies, no research design restriction was while searching for articles for the review.

A closer look into the research design of the identified articles shows that 18 of the 21 studies are empirical studies. Case studies and surveys are by far the most widely used research strategies. On the other hand, grounded theory research and mixed research method strategies are not preferred by business-IT alignment studies investigating organizational structure.

4.3 What are the findings of the reviewed articles?

The findings of the study reveal that business-IT alignment remains to be one of the most critical and chronic problems for organizations. The volume of the relevant articles identified in comparison with the cumulative studies on business-IT alignment indicates that organizational structure and its role on business-IT alignment has not attracted the attention of researchers. According to [2], one possible argument is that previous studies have focused on aligning business- and IT strategies while giving little weight for conducive organizational structure that is necessary to achieve overall business-IT alignment at the strategic, operational and tactical levels. In the next paragraphs, the summary of the main findings of the studies reviewed is discussed.

Organizational structure may result in different levels of business-IT alignment within the same organization
A study by [24] found that the type of organizational structure in a firm influences the level of shared language, CIO's business knowledge, top level business leaders' IT knowledge which directly affects business-IT alignment at strategic level. The presence of different levels of business-IT alignment within the same organization is also observed when different units are assessed depending on how the organization is configured. [22] argues that the appropriate level of analysis of studies on business-IT alignment, therefore, needs to be on a department/unit level. Another study by [40] found that organizational structures that put IT functions detached from the rest of the organization risks the creation of various sets of groups that eventually develop different unique organizational cultures. According to the authors, different cultures create varying norms and acceptable ways of work that could affect, for instance, the credibility of the IT unit (trust) which ultimately can affect business-IT alignment. Several studies [20, 22, 41] also acknowledge the importance of maintaining a fit between organizational structure and organizational culture. On the other hand, a study based on multi-dimensional view of business-IT alignment—strategic alignment and social alignment—has found the importance of informal organizational structure, particularly on social alignment [25].

Informal organizational is found to affect business-IT alignment more than formal organizational structure

The relationship between organizational structure and business-IT alignment has been confirmed by several studies, for instance, [31, 33]. However, there are studies arguing for more efforts to be allocated for facilitating and cultivating the creation of informal organizational structures in order to improve business-IT alignment. For instance, [9, p. 99] argue that informal organizational structures are becoming the norm in many organizations as "boundaryless organizations" in the 21st century organizations are undermining the role of formal organizational structure. In the same vein, Lee and Leifer [41] argue that many organizations are experimenting with different forms of new arrangements that facilitate coordination and information sharing which in turn could improve business-IT alignment. Among these types of informal organizational structures, the authors point out the prevalence of what is referred as 'self-directed teams' which is a different arrangement than a contemporary formal organizational structure. However, there are also contradictory findings that challenged the significance of informal organizational structure. For instance, [8, 24] argue that formal organizational structures are more efficient in improving shared understanding that is associated with business-IT alignment at the strategic level. However, studies have also shown that the relatively transient aspect of business-IT alignment—formal organizational structure—is less challenging for organizations [9, 20].

Organizational structures influence on business-IT alignment is not explored in some sectors/industries

Analysis of the findings of the reviewed articles also reveals few studies that focused on specific organization types to propose practices that could help design appropriate organizational structure which leads to business-IT alignment. This is consistent with findings of previous studies. For instance, the study by [43] found only few studies that have investigated the role of informal organizational structure on business-IT alignment in the public sector. Among the reviewed articles, there are studies investigating small and medium enterprises [15, 37]; multinational companies [35]; insurance, manufacturing [32]; as well as organizations in the healthcare sector [25]. Most of the studies attempted to investigate whether a generic 'ideal' organization structure exists to support business-IT alignment. For instance, [21] found that, even though contextual differences need to be investigated, public and private organizations across industries fail to consider complex environmental as well as internal variables when they restructure their organizations.

Designing appropriate organizational structure which favorably influences alignment is the function of inter-organizational- and external environmental factors

The authors of [35] proposed both internal organizational- as well as external factors that need to be considered to decide which organizational structure are suitable for multinational companies. There are other studies identifying different factors that should determine the type of organizational structure to help in the realization of business-IT alignment. For instance, firms' overall strategy [32, 41] decision making arrangements [3, 20, 32], organization culture [3, 20, 22, 40], firm size [3, 32, 37], human resource practices [15], as well as geographical proximity of different units of the organization [3, 19, 35-36] constitute inter-organizational factors.

5   Concluding Remarks and Future Research Directions

This study has attempted to shed light on the role of organizational structure on business-IT alignment based on the findings of extant research. The analysis of the findings of the reviewed studies confirms the importance of appropriate organizational structure on business-IT alignment. However, the studies fall short of identifying the types of organizational structures that are more appropriate for organizations to achieve and maintain alignment. The studies also present contradictory findings on the significance of informal organizational structure on IT alignment. Even though most of the articles did not explicitly stated the theories used, the review has uncovered few studies that attempted to propose organizational structures in order to achieve and maintain business-IT alignment based on different theories. However, unless the findings are corroborated empirically reflecting the configurations of today's organizations, the addition of knowledge of the findings for research and practice will be limited. Various combinations of organizational structures (formal/informal) in different sectors and across industries need to be examined to understand the role they play on business-IT alignment. Most of the findings of empirical studies are derived from small number of organization which limited the scope of generalization.

Caution should be taken while interpreting the findings of this study due to the following limitations. To start with, the selection of the articles is limited to peer-reviewed journals and conference proceedings in the information systems domain. Since business-IT alignment is a phenomenon transcending different research areas—information systems, business administration, management—studies that are published in other outlets might not be identified and included in this review. The fact that there is a lack of consensus on the terminologies and description of business-IT alignment makes it difficult to search for studies using keywords which might have resulted in relevant studies not to be caught by the search for this review. The generalizability of this study could have been improved by undertaking a broader search of literature including in the cognate research domains.

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