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IT FLEXIBILITY, CAPABILITIES AND IT-BUSINESS ALIGNMENT: DO ORGANIZATIONAL CHARACTERISTICS AND CONTEXT MATTER?

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ABSTRACT

The relationship between IS flexibility, IT capability, and IT-Business alignment is well recognized in both theoretical and practitioner's literature. However, there is much less understanding upon what factors these relationships might be contingent. At the same time, there is growing evidence that both internal and external factors may be important and influential. Therefore, to enhance the existing IT-Business alignment research, this study presents and empirically tests a moderator framework of IS flexibility, IT capability, and IT-Business alignment. The influence of both endogenous (organizational size, strategic orientation) and exogenous (environmental uncertainty, industry environment) moderators is considered. The research confirmed the positive relationships between IT flexibility, IT capability, and IT-business alignment. System infrastructure, connectivity, and IT relationship to organizational tasks showed individual statistically significant influences. Environmental uncertainty and, to a lesser degree, firm's strategic orientation demonstrated significant moderating effects. Theoretical and practical implications of the findings are discussed

Keywords: *IT-Business Alignment, IT Flexibility, IT Capability, Environmental Uncertainty, Strategic Orientation*

1. INTRODUCTION

The importance of IT-business alignment has been recognized for several decades now [1], [2], [3], [4], [5], [6]. Studies identified a number of benefits of achieving such alignment, including better organizational performance, improved efficiencies, and competitive advantage [7], [8], [9], [10]. On the other hand, absence of IT-business alignment has been associated with poor organizational outcomes [11], [12], [13]. As such, IT-business alignment can be considered one of the major goals pursued by organizations today.

Information systems (IS) flexibility is often named as one of the major factors in achieving competitive advantage [14], [15], [16]. This is due to the increased pressures on organizations to be agile and act fast in response to the constantly changing external environments [17], [18], [19]. Flexible information systems in this regard enable swift technological actions that not only support ongoing operations but also help organizations adapt effectively to the various conditions in which they operate. The Dynamic Capabilities View (DCV) of the firm supports this notion by suggesting that in order to respond to the constantly changing, competitive external environments, organizations must "integrate, build, and reconfigure internal and external competencies" (p.512) [20].

Like IS flexibility, information technology capability is also considered one of the major factors contributing to IT-business alignment and, consequently, improved organizational performance [3], [15], [21]. From the strategic perspective, these capabilities represent a collection of IT-related aspects that enable coordination between information system assets and organizational strategies for a competitive advantage [21], [22]. Studies confirmed the positive impact of IT capabilities in organizations, including IT architecture and infrastructure, IT human resources, IT business experience, IT relationship resources, and IT learning [15], [22], [23].

While the link between IS flexibility, IT capabilities, and IT-business alignment has been established [15], [19], there is much less understanding upon what factors these relationships might be contingent. At the same time, there is growing evidence that both internal

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and external factors may be important and influential. To some extent, the moderating effects of organizational size and environmental uncertainty have been addressed in literature [10], [12], [16], [24], [25]. However, such effects are rarely assessed within the entire framework of the relationships between IT flexibility, dynamic capabilities, and IT-business alignment. At the same time, scholars have recently proposed that investigating moderators of these relationships could substantially enhance the existing strategic alignment research [15], [25], [26]. Accordingly, this study sought to answer this call.

2. LITERATURE REVIEW

IT-business alignment can be viewed as "applying information technology (IT) in an appropriate and timely way, in harmony with business strategies, goals and needs (p.3) [27]. Within the resource-based view (RBV) of the firm [28], IT can be seen as a collection of firm's resources and capabilities that can become a source of competitive advantage whenever the firm can "conceive, implement, and exploit valuable IT applications" (p. 491) [29]. In alignment research, the RBV was used to explain how knowledge sharing between senior managers and IT managers would lead to attain competitive advantage [30], [31]. However, the RBV has been criticized for being a static theory, not suitable for dynamic environment applications [32], [33]. Alignment theorists, in turn, view alignment as a process of continuous change and adaptation [34]. As a result, the RBV is supplemented with the Dynamic Capabilities Framework (DCF) to offer a more comprehensive view on IT-business alignment.

Teece et al. defined dynamic capabilities as the ability of an organization to "integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" [20] (p. 516). These capabilities help organizations adjust its strategy to maintain competitive advantage. The focus of the DCF is the analysis of how organizational positions in uncertain environments are supported and balanced by organizational resources. Within this perspective, IT-business alignment can be considered a dynamic capability [35], [36]. Schwarz et al., for example, proposed that business applications using global IT infrastructure are considered a dynamic organizational resource and defined IT-Business alignment as the degree to which "top management is committed to aligning IT and business strategy for competitive advantage" [36] (p. 67). Similarly, Tallon and Pinsonneault defined IT-Business alignment as the degree of fit between organizational business strategy and IT. They argued that alignment is related to organizational agility – the ability to react fast to changes to maintain competitive advantage [18]. These conceptualizations of IT-Business alignment suggest that it involves organizational ability to reconfigure itself to adapt to environmental changes, which is in line with dynamic capabilities definition introduced by Teece et al. [20].

The Dynamic Capabilities View of IT-Business alignment emphasizes the need to strategically formulate IT roles and objectives in context of business objectives of an organization. In this way, positive value from IT investment can be retrieved [35], [37]. However, this approach also considers differences in organizational needs and assumes that organizational context should matter in defining IT-Business alignment [38], [39]. As a process then, strategic IT-Business alignment would be contingent on a particular organization and its environment [10], [40]. Therefore, there is a need to explore which particular organizational and environmental characteristics matter in this process.

3. RESEARCH MODEL AND HYPOTHESES

3.1. General Model

Within the dynamic capabilities view, organizations are able to effectively respond to the environment if they can integrate, build, and reconfigure their competencies [20]. As literature review demonstrated, IT-Business alignment can be considered a dynamic capability and, therefore, enable effective strategic response. Empirical investigations confirmed that IT-Business alignment is largely influenced by two technology aspects: flexibility and capability.

IT Flexibility can be defined as "the degree of decomposition of an organization's IT portfolio into loosely coupled subsystems that communicate through standardized interfaces" (p. 1471) [19]. The concept emerged from the modular systems theory which argues that decomposed, i.e. flexible units evolve faster [41]. Modularity was identified as one of the antecedents of dynamic capabilities by [42]. In IT applications, modularity is used as one of the key

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flexibility elements, which in turn is considered an enabler of strategic alignment and competitiveness [18], [19], [43]. Past empirical work defined IT flexibility in terms of modularity, connectivity, compatibility, transparency, and scalability [15], [19]. Therefore, the following hypotheses are formulated:

H1: IT flexibility relates to IT-Business alignment
H1a: IT modularity relates to IT-Business alignment
H1b: IT connectivity relates to IT-Business alignment
H1c: IT compatibility relates to IT-Business alignment
H1d: IT transparency relates to IT-Business alignment
H1e: IT scalability relates to IT-Business alignment

IT capabilities can be defined as IT-related resources to coordinate organizational processes and support organizational strategies [21]. Organizations can extract value from IT capabilities by using them to improve revenues, reduce costs, and improve synergy [23]. Researchers identified a number of such resources, including IT infrastructure, IT architecture, IT human resources, and IT relationship to organizational tasks [19], [44], [45]. Jorfi et al. found that IT capabilities had a positive relationship with IT-Business alignment [15]. Therefore, the following hypotheses are formulated:

H2: IT capabilities relate to IT-Business alignment
H2a: IT infrastructure relates to IT-Business alignment
H2b: IT architecture relates to IT-Business alignment
H2c: IT human resources relate to IT-Business alignment
H2d: IT relationship to organizational tasks relates to IT-Business alignment

3.2. Moderating Factors

The Dynamic Capabilities View considers the capabilities contingent upon both organizational and external environment variables [20]. While the moderating effects of such variables were not yet investigated empirically, the possibility of such effects on the relationships between IT flexibility, capabilities, and IT-business alignment can be deduced from available literature. The role of exogenous variable in alignment literature, for example, is a well-established fact. Studies by [24] and [46] established that environmental uncertainty presents both opportunities and challenges for organizations to properly employ their dynamic capabilities for strategic purposes. Empirical studies by [10] and [25] found that environmental uncertainty moderates the processes leading to strategic alignment. In similar manner, the effect of industry was analyzed and confirmed. Xue et al. found that different industry environments moderate formation of organizational IT portfolios that contribute to business strategy [47]. Chae et al. found that industry environment moderates the relationship between technology capability and firm performance [23]. Therefore, the following hypotheses are formulated:

H3a: Environmental uncertainty will moderate the relationship between IS flexibility and IT-Business alignment

H3b: Environmental uncertainty will moderate the relationship between IT capabilities and IT-Business alignment

H3c: Industry environment will moderate the relationship between IS flexibility and IT-Business alignment

H3d: Industry environment will moderate the relationship between IT capabilities and IT-Business alignment

The possible moderating roles of organizational characteristics can also be deduced from the available literature. The role of organizational size is recognized, although it lacks certainty. Zhu and Kraemer, for example, argued that larger firms have more capabilities due to financial power, but they may lack flexibility to react fast technologically due to bureaucracy more levels of decision making [48]. Karimi et al., on the other hand, proposed that smaller firms would have stronger capabilities due to opportunity sense making [49]. Rashidirad et al. found that firm size matters in the process of alignment business value creation [25]. Finally, firm's strategic orientation may affect the relationship between flexibility, capabilities, and IT-business alignment. Firm strategic orientation is traditionally linked to strategic alignment and performance [50], [51]. Empirical literature supports the moderating role of strategic orientation in alignment process and organizational performance [10], [19]. Therefore, the following hypotheses are formulated:

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H4a: Organizational size will moderate the relationship between IS flexibility and IT-Business alignment

H4b: Organizational size will moderate the relationship between IT capabilities and IT-Business alignment

H4c: Strategic orientation will moderate the relationship between IS flexibility and IT-Business alignment

H4d: Strategic orientation will moderate the relationship between IT capabilities and IT-Business alignment

3.3. Final Model

Figure 1 presents the finalized research model for the study. The direct effects of IS flexibility and IT capabilities on IT-Business alignment are investigated along with the moderating effect of exogenous (environmental uncertainty, industry environment) and endogenous (organizational size, strategic orientation) variables

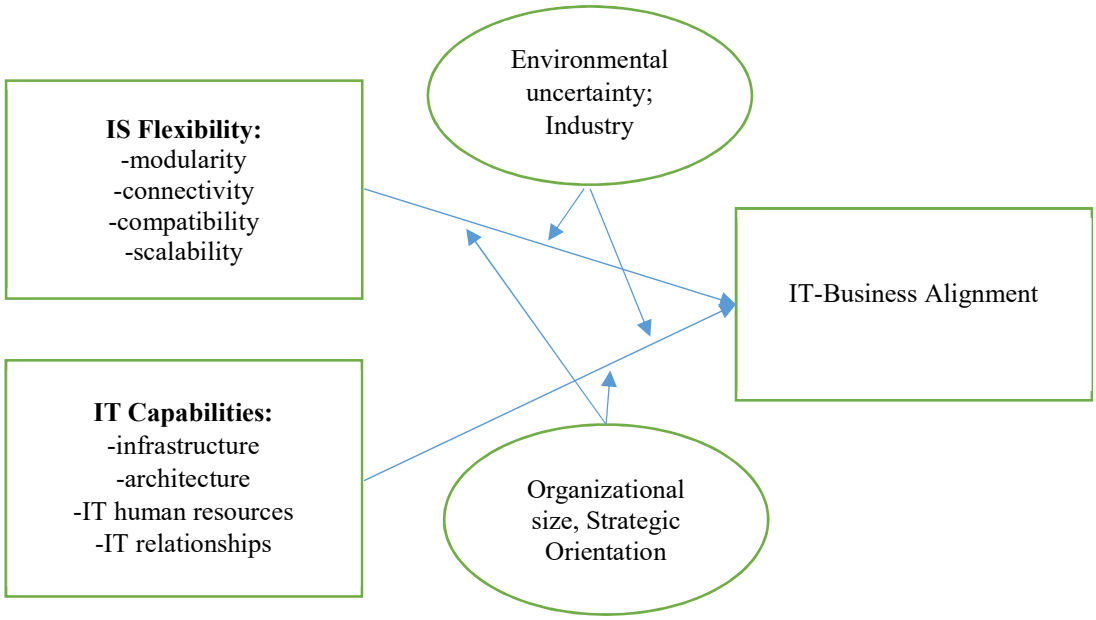

Figure 1. Research Model

4. METHODOLOGY

To test the hypotheses formulated in the study, a survey was conducted among the IT managers of Saudi business organizations. The Saudi Business Directory listing over 150,000 business records was used to select the study participants with a randomized number generator program. Survey invitations were sent by email with a link to the online questionnaire. The questionnaire was developed based on the previously validated items from [1], [10], [15] and [19]. The items were translated into Arabic using Brislin's technique of back translation [52]. A pilot test was conducted with six IT professionals to ensure the items' comprehensibility. The finalized 36-item questionnaire is presented in Appendix A. The collected data were analyzed using SPSS v.22 software.

5. RESULTS

5.1. Sample Characteristics

A total of 385 valid questionnaires were collected from 1000 distributed invitations. This gives a response rate of 38.5% and a 95% confidence level based on the population size. Table 1-3 below describe the sample in terms of company size, strategy type, and industry. In terms of size, the majority of the firms in the sample were medium (42.86%) and small (33.51%) size, with large firms representing the remaining 23.64%. The companies in the sample represented 13 industries, with the largest representation of retail

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(19.9%), IT (13.0%), and finance services (9.9%). In terms of strategic orientation, defender and prospector accounted for 34.8% and 34.5% respectively, with a smaller percentage of firms pursuing the analyzer strategy (30.6%).

Table 1: Sample Distribution by Company Size

Firm size	Frequency	Percent
Small (less than 50 employees)	129	33.5
Medium (50 to 100 employees)	165	42.9
Large (over 100 employees)	91	23.6
Total	385	100.0

Table 2: Sample Distribution by Strategic Orientation

Firm's Strategy	Frequency	Percent
Defender	134	34.8
Prospector	133	34.5
Analyzer	118	30.6
Total	385	100.0

Table 3: Sample Distribution by Industry

	Frequency	Percent
IT	50	13.0
Manufacturing	24	6.2
Retail	76	19.7
Sales	31	8.1
Education	27	7.0
Finance	38	9.9
Construction	28	7.3
Hospitality	15	3.9
Food & Beverage	15	3.9
Healthcare	24	6.2
Legal	16	4.2
Oil and Gas	16	4.2
Real Estate	25	6.5
Total	385	100.0

5.2. Preliminary Analysis

The unidemnsionality of the constructs was tested by performing an exploratory factor analysis (EFA). The R-matrix determinant was estimated at 0.0000196 which is above the recommended level of at least 0.00001 (Field, 2009). The fit for the data was confirmed with the Bartlett sphericity test ($p < .001$) and the Kaiser-Meyer-Olkin value (0.834). The scale level constructs of the study showed good factor loadings as is shown in Appendix B.

The analysis of the constructs' normality and reliability is presented in Table 4. All constructs demonstrated acceptable levels of reliability with the values above 0.7 [53]. The absolute values for skewedness and kurtosis were within the acceptable ranges of 2 and 7 respectively [54], [55] (Curran et al., 1996; Fabrigar et al., 1999). Therefore, the data did not have issues with either reliability or normality.

The constructs' discriminant and convergent validity were measured with the average variance extract (AVE) method. Generally, raw AVE construct scores above 0.5 are considered acceptable for construct validity [56]. Discriminant validity is achieved when the square roots of constructs' AVE are above cross-construct correlations [57]. As Table 5 demonstrates, all constructs' AVE were well above the 0.5 cutoff point, and no cross-construct correlations exceeded the AVE square roots. Therefore, the requirements for both construct and discriminant validity were met.

Finally, the data were checked for a common method bias. Following [58], Harman's single-factor analysis was performed by loading study constructs into an EFA with a cutoff point of 50%. The highest factor was 21.37% which means that the data did not suffer from the common method bias.

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Table 4: Constructs' Reliability, Skewness, and Kurtosis

Construct	Items	Cronbach's Alpha	Mean	St Dev	Skewness	Kurtosis
ITBA	5	0.769	31.75	2.971	-.876	.647
EU	4	0.769	25.83	2.309	-1.034	.603
ITCinf	3	0.774	18.21	2.302	-.688	.087
ITCarc	3	0.860	14.06	4.476	-.277	-.866
ITChr	3	0.852	15.80	4.116	-1.181	1.185
ITCrel	3	0.754	16.96	2.285	-.743	1.124
ITFmod	3	0.852	15.80	4.116	-1.181	1.185
ITFconn	3	0.726	16.38	3.256	-.708	.253
ITFcomp	3	0.953	14.21	4.317	-.269	-1.030
ITFscal	3	0.943	14.89	3.724	-.233	-.872

Table 5: AVE and Cross-Correlations of Constructs

	ITBA	EU	ITCinf	ITCarc	ITChr	ITCrel	ITFmod	ITFconn	ITFcomp	ITFscal
AVE	0.68	0.70	0.77	0.84	0.85	0.80	0.85	0.76	0.88	0.84
ITBA	**0.822**									
EU	.524	**0.834**								
ITCinf	.358	.485	**0.878**							
ITCarc	-0.065	-0.053	-0.052	**0.914**						
ITChr	.228	.208	.240	-.324	**0.920**					
ITCrel	.203	.139	.126	-0.021	.155	**0.893**				
ITFmod	.228	.208	.240	-.324	.765	.155	**0.920**			
ITFconn	.314	.258	.232	-0.060	.323	.319	.323	**0.872**		
ITFcomp	-0.070	-0.026	-0.045	.675	-.300	-0.004	-.308	-0.062	**0.936**	
ITFscal	-0.093	-0.082	-.104	.781	-.286	-0.025	-.286	-0.078	.687	**0.914**

NOTE: AVE square roots are given in diagonals

5.3. Regression Analyses

Ordinary least square (OLS) regression analysis was used to test the relationships between the IT flexibility and capability components and IT-business alignment. The normality, linearity, and heteroskedascisity assumptions were tested with residual analysis. To test the study hypotheses, three regression models were analyzed: one with the Index Flexibility and Capability variables, one including the components of each, and one including the moderator variables.

The direct effects of the considered variables on the IT-business alignment are presented in Table 6. The model was statistically significant ($p < .001$) with the adjusted R-squared = 0.093. Therefore, the results of the analysis supported hypotheses 1 and 2: both IT flexibility and IT capability have a statistically significant positive relationship with IT-business alignment. These factors accounted for 9.3% variation in the latter. A further analysis showed that capability had a stronger effect ($\beta = 0.410$; $t = 5.505$; $p < .001$) than flexibility ($\beta = 0.151$; $t = 2.030$; $p = .043$).

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Table 6: Regression Analysis: IT Flexibility and Capability on IT-Business Alignment

Model		Beta	t	Sig.
1	(Constant)		15.944	.000
	ISFlexibility	.151	2.030	.043
	ITCapability	.410	5.505	.000
Adj. R-squared = .093; p < .001				

The direct effect of the variable components on IT-business alignment were tested in Model 2 by including four sub-constructs comprising IT flexibility and capability constructs. The results of the analyses are presented in Table 7. While the model was statistically significant (adj. R-squared = .185; p < .001), not all sub-constructs demonstrated positive relationship with IT-business alignment. Statistically significant results were observed for IT infrastructure (β = 0.280; t = 5.776; p < .001), IT relationships (β = 0.134; t = 2.437; p = .034), and connectivity (β = 0.191; t = 3.713; p < .001). The relationships by other sub-constructs with IT-business alignment were not significant.

Table 7: Regression Analysis IT Flexibility and Capability Components on IT-Business Alignment

Model		Beta	t	Sig.
2	(Constant)		12.222	.000
	ITCinf	.280	5.776	.000
	ITCarc	.059	.531	.596
	ITCrel	.134	2.437	.034
	ITFmod	.078	1.496	.135
	ITFconn	.191	3.713	.000
	ITFcomp	-.046	-.480	.631
	ITFscal	-.039	-.526	.599
Adj. R-squared = .185; p < .001				

The final model tested for the effect of moderators in the relationship between IT flexibility, capability, and IT-business alignment. Among the four moderating factors tested, statistically significant observations were for environmental uncertainty and strategic orientation meaning that Hypotheses 3 and 4 were partially supported. The results are presented in Table 8. Note that environmental uncertainty had a negative moderation effect on the IT capability – alignment relationship and a positive moderating effect on the IT flexibility – alignment relationship. Overall, environmental uncertainty seemed to have a more pronounced effect that strategic orientation, which follows from the stronger improvements of adjusted R-square in comparison to the model with no moderators included.

Table 8. Effect of Moderators

Model		Beta	t	Sig.
1	(Constant)		4.374	.000
	ISFlexibility	.164	1.954	.001
	ITCapability	.197	2.830	.005
	StrOr	.475	9.855	.000
	ITCapabilityxStrOr	.104	1.152	.039
	ITFlexibilityxStrOr	.080	1.113	.041
Adj. R-squared = .106, p < .001				
Model		Beta	t	Sig.
2	(Constant)		6.489	.000
	ISFlexibility	.512	2.585	.010
	ITCapability	.824	3.972	.000
	EU	.102	2.110	.036
	ITFlexibilityxEU	.374	1.936	.038
	ITCapabilityxEU	-.433	-2.140	.033
Adj. R-squared = .286, p < .001				

6. DISCUSSION

The results of the study allow to draw some important insights into the nature of IT-business alignment and the factors that enable it. The study confirmed positive relationships between both IT capability, IT flexibility, and IT-business alignment. This aligns with the previous findings in the empirical IT management literature [15], [19]. It seems that the realities of the modern competitive business world dictate that forms develop both IT capabilities and IT flexibility to address environment changes and develop IT-business alignment. This view has been supported by both theoretical and practical literatures [59], [60], [61], [62].

An important contribution was the investigation of these variables as composite antecedents, consisting of a number of theoretically and practically justified sub-constructs. Some of these sub-constructs demonstrated statistically significant relationships with IT-business

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alignment. Specifically, connectivity, IT infrastructure, and IT relationship resources were identified as significant factors. These results are hardly surprising. Connectivity enables information sharing across an organization and externally with its business partners. This leads to a better alignment since organizations are able to establish strong links between IT and business strategy through better planning, coordination, and execution of tasks. Similarly, IT infrastructure, envisioned as a composite of firm's hardware, applications, and networks, should enhance IT-business alignment by creating a supportive IT structure for decision making processes and collaboration at different organizational levels. Finally, IT relationship resources encompass direct collaboration between IT and business departments. This ensures that IT is applied in harmony with business goals and objectives.

Nevertheless, the hypothesized influence of several sub-constructs was not confirmed, which requires further exploration. Contrary to predictions, IT architecture did not have a significant effect on IT-business alignment. One explanation could be the presence of two terms, infrastructure and architecture. Infrastructure is a more general concept that can be tied up with business goals. Architecture, in turn, is often used as a strategic weapon [15], whereas firms in the sample were more likely to envision it as operations support. Further, the absence of statistically significant effect of modularity could be explained by the fact that the majority organizations, especially smaller ones and not in IT sector, would use outsourced or purchased IT systems. Modularity component would be better applied to software and network components developed in house and scaled up as business expands. Proprietary systems require IT personnel and resources which is often quite costly for such companies to maintain. Similarly, compatibility of IT systems requires substantial resources and investments which are available to larger organizations. Midsize and small size firms are more likely to acquire IT modules catering to their specific business needs. The same can be assumed in relation to IT systems' scalability. Size and budget of a firm as well as its use of IT may determine the need for scalability; therefore, the absence of significant relationship with IT-business alignment may be explained by the presence of firms that prefer matching IT for business needs at present and investing in expansion of such systems with the growth of business if necessary. Overall, these results render further comparisons between smaller and larger firms that may, in fact, have different IT system tasks and scale.

7. CONCLUSIONS

This study aimed to test the contingency assumption regarding the relationship between IT flexibility, IT capability, and IT-business alignment. The results of the findings suggest that both internal and external factors may be in play to influence the aforementioned relationships. Whereas the link between IT flexibility, IT capability, and IT-business alignment was confirmed, environmental uncertainty and firm's strategic orientation demonstrated strong moderating effects on that link.

The effect of environmental uncertainty was more pronounced. Higher environmental uncertainty led to stronger relationship between IT flexibility and IT-business alignment, while less uncertainty would lead to stronger relationships between IT capability and IT-business alignment. These findings are logical. Highly uncertain, hostile, and competitive environments would prompt firms to employ highly flexible information systems that can easily adapt to changes. This could be as well one of the sources of competitive advantage. On the other hand, realizing the full potential of IT capability is possible in more stable environments, where the systems can be used in their original forms for a longer period of time and offer real value before changes become necessary. In stable business environments, it would make sense to invest in larger scale IT projects for IT-business alignment and improved performance as a result.

The moderating effect of strategic orientation was statistically significant, although not as strong as the effect of environmental uncertainty. It seems that the impact of IT flexibility and IT capability on IT-business alignment is only slightly affected by which competitive strategy a company uses. Moreover, neither size of the firm, nor industry seemed to affect those relationships. This may indicate that organizations in all industries and all sizes equally consider the importance of IT-business alignment and recognize the role of flexible, capable IT systems to achieve it. Information technology has truly become a required component for all businesses in the modern competitive world.

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From a practical standpoint, the results of the study can offer some valuable insights into managing IT in business organizations. Investments in IT systems should be organized in a way that creates both flexible and capable infrastructures leading to stronger IT-business alignment. More flexible systems are preferred in more competitive, fast-changing environments whereas more capable systems with more pronounced infrastructure and stronger relationship tasks may be preferred in stable environments. In either case, however, neither flexibility, nor capability of the systems should remain ignored.

The results of this study still have to be considered in light of several limitations. First, the study was conducted in a specific context of the Saudi business environment. For the countries with different legal, cultural, and economic systems, the findings may not be readily generalizable. Studies in different contexts may actually become very useful from a comparative perspective in this regard as they may demonstrate the points of convergence and divergence in IT-business alignments in different national environments.

Another limitation is the use of single respondents to represent organizations. This approach, although easier to implement, has been somewhat criticized earlier [63]. A more reliable collection of data would involve multiple informants for the organizational study constructs. As for the constructs themselves, there is still very limited literature splitting IT flexibility and IT capability into sub-constructs. More research in this direction may offer stronger conceptualizations of the sub-constructs and refining their representation in the IT flexibility and capability constructs. Further, investigating possible interrelationships between those sub-constructs could offer more insight into formation of IT-business alignment.

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REFERENCES

[1] J. Gerow, J. Thatcher and V. Grover, "Six types of IT-business strategic alignment: an investigation of the constructs and their measurement," *European Journal of Information Systems,* no. 24, pp. 465-491, 2015.

[2] C. Kahre, D. Hoffmann and F. Ahlemann, "Beyond business-IT alignment - digital business strategies as a paradigmatic shift: A review and research agenda," in *Proceedings of the 50th Hawaii International Conference on System Sciences*, Honolulu, 2017.

[3] J. Luftman, R. Papp and T. Brier, "Enablers and inhibitors of IT-business alignment," *Communications of the Association for Information Systems,* vol. 1, no. 1, pp. 1-33, 1999.

[4] J. Oroszo, A. Tarhini, R. Masa'deh and T. Tarhini, "A framework of IS/Business Alignment management practices to improve the design of IT governance architectures," *International Journal of Business and Management,* vol. 10, no. 4, pp. 1-12, 2015.

[5] R. Rathnam, J. Johnsen and H. Wen, "Alignment of business strategy and it strategy: a case study of a fortune 50 financial services company," *Journal of Computer Information Systems,* vol. 45, no. 2, pp. 1-8, 2005.

[6] C. Street, B. Gallupe and J. Baker, "Strategic alignment in SMEs: strengthening theoretical foundations," *Communications of the Association for Information Systems,* vol. 40, no. 20, pp. 420-442, 2017.

[7] D. &. D. Z. Almajali, "Applying the triangulation approach in IT – Business strategic alignment and sustainable competitive advantage.," *IBIMA Business Review Journal,* pp. 1-13, 2011.

[8] Y. Chan, R. Sabherwal and J. Thatcher, "Antecedents and outcomes of strategic IS alignment: an empirical investigation," *IEEE Transactions on Engineering*

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

Management, vol. 53, no. 1, pp. 27-47, 2006.

[9] J. Gerow, J. Thatcher, V. Grover and P. Roth, "Looking toward the future of it–business strategic alignment through the past: A meta-analysis.," *MIS Quarterly,* vol. 38, no. 4, pp. 1159-1185, 2014.

[10] A. Yayla and Q. Hu, "The impact of IT-business strategic alignment on firm performance in a developing country setting: exploring moderating roles of environmental uncertainty and strategic orientation," *European Journal of Information Systems,* vol. 21, no. 4, pp. 373-383, 2012.

[11] C. Alaceva and L. Rusu, "Barriers in achieving business/IT alignment in a large Swedish company: What we have learned?," *Computers in Human Behavior,* vol. 51, no. B, pp. 715-728, 2015.

[12] D. Chen, M. Mocker, D. Preston and A. Teubner, "Information systems strategy: Reconceptualization, measurement, and implications.," *MIS Quarterly,* vol. 34, no. 2, pp. 233-259, 2010.

[13] M. Ravishankar, S. Pan and D. Leidner, " (2011). Examining the strategic alignment and implementation success of a KMS: A subculture-based multilevel analysis.," *Information Systems Research,* vol. 22, no. 1, pp. 39-59, 2011.

[14] M. Furukawa, S. Hirobayashi and T. Misawa, "IT flexibility planning for IT/business strategy alignment via future-oriented POC analysis," *International Journal of Industrial and Systems Engineering,* vol. 7, no. 5, pp. 1302-1311, 2013.

[15] S. Jorfi, M. Khalil and L. Najjar, "An empirical study of the role of IT flexibility and IT capability in IT-business strategic alignment," *Journal of Systems and Information Technology,* vol. 19, no. 1-2, pp. 2-21, 2017.

[16] P. Mikalef, A. Pateli and R. Wetering, "IT flexibility and competitive performance: the mediating role of IT-enabled dynamic capabilities," in *Twenty-Fourth European Conference on Information Systems (ECIS)*, Istanbul, 2016.

[17] E. Overby, A. Bharadwaj and V. Sambamurthy, "Enterprise agility and the enabling role of information technology," *European Journal of Information Systems,* vol. 15, no. 2, pp. 120-131, 2006.

[18] P. Tallon and A. Pinsonneault, "Competing perspectives on the link between strategic information technology alignment and organizational agility: insights from a mediation model," *MIS Quarterly,* vol. 35, no. 2, pp. 463-486, 2011.

[19] R. Wetering, P. Mikalef and A. Pateli, "A strategic alignment model for IT flexibility and dynamic capabilities: toward an assessment tool," in *25th European Conference on Information Systems (ECIS)*, Guimarães, 2017.

[20] D. Teece, G. Pisano and A. Shuen, "Dynamic capabilities and strategic management," *Strategic Management Journal,* vol. 18, no. 7, pp. 509-533, 1997.

[21] S. Oh, H. Baek and S. Lee, "Revisiting the Relationship between Information Technology Capability and Firm Performance: Focusing on the Impact of the Adoption of Enterprise Resource Planning Systems," *Journal of Information Systems,* vol. 25, no. 1, pp. 49-73, 2016.

[22] G. Bhatt and V. Grover, "Types of information technology capabilities and their role in competitive advantage: an empirical study," *Journal of Management Information Systems,* vol. 22, no. 2, pp. 253-277, 2005.

[23] H.-C. Chae, C. Koh and K. Park, "Information systems capability and firm performance: role of industry," *Information & Management,* vol. 55, no. 5, pp. 525-546, 2018.

[24] P. Pavlou and O. El Sawy, "Understanding the elusive black box of dynamic capabilities," *Decision Sciences,* vol. 42, no. 1, pp. 239-273, 2011.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[25] M. Rashidirad, E. Soltani and H. Salimian, "Do contextual factors matter? A missing link between competitive strategies - dynamic capabilities alignment and e-business value," *Strategic Change,* no. 23, pp. 81-92, 2014.

[26] J. Luftman and K. Lyytinen, "Enhancing the measurement of information technology (IT) business alignment and its influence on company performance," *Journal of Information Technology,* vol. 32, no. 1, pp. 1-21, 2015.

[27] J. Luftman, "Assessing business-IT alignment maturity," *Communications of AIS,* vol. 14, no. 4, pp. 1-49, 2000.

[28] J. Barney, "Firm resources and sustained competitive advantage," *Journal of Management,* vol. 17, no. 1, pp. 99-120, 1991.

[29] F. Mata, W. Fuerst and J. Barney, "Information technology and sustained competitive advantage: a resource-based analysis," *MIS Quarterly,* vol. 19, no. 4, pp. 487-505, 1995.

[30] G. Kearns and A. Lederer, "A resource-based view of strategic IT Alignment: how knowledge sharing creates competitive advantage," *Decision Sciences,* vol. 34, no. 1, pp. 1-29, 2003.

[31] G. Kearns and R. Sabherwal, "Strategic alignment between business and information technology: a knowledge-based view of behaviors, outcome, and consequences," *Journal of Management Information Systems,* vol. 23, no. 3, pp. 129-162, 2006.

[32] J. Baker and D. Jones, "A theoretical framework for sustained strategic alignment and agenda for research," *Sprouts: Working Papers on Information Systems,* vol. 8, no. 16, pp. 1-30, 2008.

[33] M. Wade and J. Hulland, "The resource-based view and information systems research: review, extension, and suggestions for future research," *MIS Quarterly,* vol. 28, no. 1, pp. 107-142, 2004.

[34] J. Henderson and N. Venkatraman, "Strategic alignment: leveraging information technology for transforming organizations.," *IBM Systems Journal,* vol. 32, no. 1, pp. 4-16, 1993.

[35] C. Pelletier and L. Raymond, "The It strategic alignment process: a dynamic capabilities conceptualization," in *Twentieth Americas Conference on Information Systems*, Savannah, 2014.

[36] C. Schwarz, H. Kefi, A. Schwarz and M. Kalika, "A dynamic capabilities approach to understanding the impact of IT-enabled businesses processes and IT-business alignment on the strategic and operational performance of the firm," *Communications of the Association for Information Systems ,* no. 26, pp. 57-84, 2010.

[37] D. Avison, J. Jones, P. Powell and D. Wilson, "Using and validating the strategic alignment model," *Journal of Strategic Information Systems,* vol. 13, no. 3, pp. 223-246, 2004.

[38] J. Kuruzovich, G. Basselier and V. Sambamurthy, "IT governance process and IT alignment: viewpoints from the board of directors," in *45th Hawaii International Conference on System Sciences*, Maui, 2012.

[39] L. Raymond and A.-M. Croteau, "Manufacturing strategy and business strategy in mdeium-sized enterprises: performance effects of strategic alignment," *IEEE Transactions on Engineering Management,* vol. 56, no. 2, pp. 192-202, 2009.

[40] H. Newkirk and A. Lederer, "The effectiveness of strategic information systems planning under environmental uncertainty," *Information & Management,* vol. 43, no. 4, pp. 481-501, 2006.

[41] H. Simon, "The architecture of complexity," *PRoceedings of the American Philosophical Society,* vol. 106, no. 6, pp. 467-482, 1962.

[42] F. Pil and S. Cohen, "Modularity: implications for imitation, innovation, and

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

sustained advantage," *Academy of Management Review,* vol. 31, no. 4, pp. 995-1011, 2006.

[43] G. Ray, W. Muhanna and J. Barney, "Information technology and the performance of the customer service process: a resource-based analysis," *MIS Quarterly,* vol. 29, no. 4, pp. 625-652, 2005.

[44] J. Luftman, C. Bullen, D. Liao, E. Nash and C. Neumann, Managing the information technology resource: leadership in the information age, Upper Saddle River: Pearson Education, 2004.

[45] J. Coughlan, M. Lycett and R. Macredie, "Understanding the business-IT relationship," *International Journal of Information Management,* vol. 25, no. 4, pp. 303-319, 2005.

[46] P. Drnevich and A. Kriauciunas, "Clarifying the conditions and limits of the contributions of ordinary and dynamic capabilities to relative firm performance," *Strategic Management Journal,* vol. 32, no. 3, pp. 254-279, 2011.

[47] L. Xue, R. Gautam and V. Sambamurthy, "Efficiency or innovation: How do industry environments moderate the effects of firms' IT asset portfolios?," *MIS Quarterly,* vol. 36, no. 2, pp. 509-528, 2012.

[48] K. Zhu and K. Kraemer, "Post-adoption variations in usage and value of e-business by organizations: cross-country evidence of retail industry," *Information Systems Research,* vol. 16, no. 1, pp. 61-84, 2005.

[49] J. Karimi, T. Somers and A. Bhattacherjee, "The role of information systems resources in ERP capability building and business process outcomes," *Journal of Management Information Systems,* vol. 24, no. 2, pp. 221-260, 2007.

[50] F. Bergeron, L. Raymond and S. Rivard, "Ideal patterns of strategic alignment and business performance," *Information & Management,* vol. 41, no. 8, pp. 1003-1020, 2004.

[51] Y. Chan, S. Huff and D. Copeland, "Assessing realized information systems strategy," *The Journal of Strategic Information Systems,* vol. 6, no. 4, pp. 273-298, 1997.

[52] R. Brislin, "Back translation for the cross-cultural research.," *Journal of Cross Cultural Research,* no. 1, pp. 185-216, 1970.

[53] L. Cronbach and R. Shavelson, "My current thoughts on coefficient alpha and successor procedures.," *Educational and Psychological Measurement,* vol. 64, no. 3, pp. 391-418, 2004.

[54] P. Curran, S. West and J. & Finch, "The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis.," *Psychological Methods,* no. 1, pp. 16-29, 1996.

[55] L. Fabrigar, D. Wegener, R. MacCallum and E. Strahan, "Evaluating the use of exploratory factor analysis in psychological research.," *Psychological Methods,* vol. 4, no. 3, pp. 272-299, 1999.

[56] J. Hair, W. Black, B. Babin and R. Anderson, Multivariate data analysis (7th ed.), New York: Pearson, 2010.

[57] W. Chin and T. Frye, PLS graph, Calgary: University of Calgary Press, 1996.

[58] P. Podsakoff, S. MacKenzie and N. Podsakoff, "Sources of method bias in social science research and recommendations on how to control it.," *Annual Review Psychology,* no. 63, pp. 539-669, 2012.

[59] L. Fink and S. Neumann, "Exploring the perceived business value of the flexibility enabled by information technology infrastructure," *Information & Management,* vol. 46, no. 2, pp. 90-99, 2006.

[60] Q. Hu and C. Huang, "Using the balanced scorecard to achieve sustained IT-business alignment: a case study," *Communications of the Association for Information Systems,* vol. 17, pp. 181-204, 2006.

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

[61] A. Johnson and A. Lederer, "The effect of communication frequency and channel richness on the convergence between chief executive and chief information officers," *Journal of Management Information Systems,* vol. 22, no. 2, pp. 227-252, 2005.

[62] F. Tan and R. Gallupe, "Aligning business and information systems thinking: a cognitive approach," *IEEE Transactions on Engineering Management,* vol. 53, no. 2, pp. 223-237, 2006.

[63] H. Newkirk, A. Lederer and C. Srinivasan, "Strategic information systems planning," in *Planning for information systems*, New York , NY: Springer, 2009, pp. 209-231.

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APPENDIX A: QUESTIONNAIRE

What is the size of your company?

Less than 50	☐
Between 50 and 100	☐
Over 100	☐

In which industry does your company operate? _____

Please, indicate, what description fits your company best:

We focus on a market niche, offering limited range of products/services in it and competing on quality, price, and superior customer service (defender)	☐
We operate in a broad product/service market that changes often. We prefer to be one of the first in the new product/service offerings (prospector)	☐
We maintain a stable limited range of products/services and choose carefully which new market developments we should follow (analyser)	☐

Please, evaluate on a 7-point scale from Strongly Disagree (1) to Strongly Agree (7) the following statements in relation to your company

Item	Wording
ITBA1	Our firm aligns IT processes with business strategy
ITBA2	IT processes in our firm support business strategy
ITBA3	Our firm adjusts IT processes to business strategy changes
ITBA4	Our firm adjusts IT goals and objectives to business strategy
ITBA5	Our firm aligns IT infrastructure with our business strategy

Item	Wording
EU1	Our industry experiences radical changes often
EU2	Products/services in our industry become obsolete fast
EU3	Customer habits in our industry vary a lot
EU4	Our industry is defined by tough competition

Item	Wording
ITCinf1	Our firm has computer sufficient facilities to support IT projects
ITCinf2	Our firm has sufficient application infrastructure services
ITCinf3	Our firm has sufficient IT support and security services
ITCarc1	IT policies and their support for business are clear in our firm
ITCarc2	Our firm has a detailed description of IT processes and services critical for business strategy
ITCarc3	In our firm, there is a clear vision of how IT contributes to business value
ITChr1	Our firm has sufficient IT skill base
ITChr2	IT personnel in our firm knows business functions and processes
ITChr3	IT personnel is skilled in developing software and hardware for the firm's needs
ITCrel1	In our firm, IT and business departments maintain close relationship
ITCrel2	In our firm, there is a good relationship between IT and other departments
ITCrel3	We have teams that blend IT and business expertise

Item	Wording
ITFmod1	Organization and integration of our IT systems allows for quick changes
ITFmod2	New functionalities can be easily added to our IT systems if needed
ITFmod3	Changes to single component does not affect our entire IT infrastructure

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ITFconn1	Our IT systems can be easily connected/integrated with third parties (suppliers, partners etc)
ITFconn2	All IT systems in our firm are well interconnected
ITFconn3	Our IT department utilizes open systems for easier connectivity
ITFcomp1	Software applications in our firm can be easily used on different platforms
ITFcomp2	Software applications in our firm can be easily transferred across different platforms
ITFcomp3	Our IT department has sufficient entry points to share information with stakeholders
ITFscal1	Information systems in our firm are scalable
ITFscal2	Our IT infrastructure is sufficient for business needs
ITFscal3	Our IT infrastructure easily handles peaks in usage

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APPENDIX B: FACTOR LOADINGS

Rotated Component Matrix[a]

	Component									
	1	2	3	4	5	6	7	8	9	10
ITBA1			.732							
ITBA2			.615							
ITBA3			.740							
ITBA4			.674							
ITBA5			.615							
EU1				.440						
EU2				.777						
EU3				.834						
EU4				.732						
ITCinf1						.743				
ITCinf2						.767				
ITCinf3						.805				
ITCarc1										.842
ITCarc2										.841
ITCarc3										.822
ITChr1		.775								
ITChr2		.878								
ITChr3		.887								
ITCrel1					.684					
ITCrel2					.853					
ITCrel3					.855					
ITFmod1									.878	
ITFmod2									.887	
ITFmod3									.775	
ITFconn1							.775			
ITFconn2							.793			
ITFconn3							.714			
ITFcomp1	.850									
ITFcomp2	.882									
ITFcomp3	.896									
ITFscal1								.846		
ITFscal2								.838		
ITFscal3								.821		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.