

Antecedent of Business - IT alignment: Role of Managing IT Investment

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Abstract: Although, since long the multifaceted effects of managing or governing IT have been taken into consideration in both practice and theoretical debate, how these bring firm performance yet unclear and limited. Drawing on the resource-based theory and the process theory, this study aims to systematically review the antecedents of business-IT alignment. The findings of this study shows that the business-IT alignment is derived from IT governance practices and managing IT investment. This study contributes to IS theory and literature with the richer insights on IT governance, management of IT, and business-IT alignment.

Keywords: Antecedents, IT governance, management of IT, business-IT alignment

1. Introduction

An enormous growing body of IS literature has examined the relationship such as IT investment - firm performance ([Ali, Green, & Robb, 2015](#); [Kim, Xiang, & Lee, 2009](#); [Peppard, Ward, & Daniel, 2007](#)), IT spending - firm performance (e.g., [Melville, Kraemer, & Gurbaxani, 2004](#); [Tallon, 2007](#)), and business-IT alignment - firm performance ([Bergeron, Raymond, & Rivard, 2004](#); [Cragg, King, & Hussin, 2002](#); [Preston & Karahanna, 2009](#); [Sabherwal & Chan, 2001](#)), leading to a key conclusion that firms with superior IT management and alignment commonly achieve greater firm performance. Drawing on the above studies, researchers cogitate to understand that the unavoidability of management of IT investment and IT governance to attain superior firm performance. Nevertheless, the examination of how the management of IT investment and IT governance derive firm performance is still inadequate.

The IT governance has a direct impact on how IT is managed within the organization and includes the implementation of IT management techniques and procedures in conformity with well-known IT strategies and policies ([Bowen, Cheung, & Rohde, 2007](#)). It is obvious that IT-enabled investments can bring enormous rewards, but only with the right governance and management

processes and full commitment from all management levels. In particular, how the various management levels like board members, executive management, and operational management will be involved in this process. the effective IT governance helps to ensure that IT supports business goals, optimizes business investment in IT, and manage IT-related risks and opportunities ([Williams, 2012](#)). The limited views on IT governance no longer resemble with what is happening in the real world, where firms are executing a portfolio of different governance mechanisms ([Boh & Yellin, 2006](#)).

In prior studies, the notion how the performance outcomes and the significance of managing IT's impact on firm performance have been called for further studies in numerous ways ([Ilmudeen & Yukun, 2018](#); [Turel, Liu, & Bart, 2017](#); [S. P.-J. Wu, Straub, & Liang, 2015](#)). Example, it warrants empirical studies with either mediation or moderator model to elucidate whether IT generates business value directly or indirectly with firm factors ([Cao, Wiengarten, & Humphreys, 2011](#)). Likewise, the managing IT and business-IT alignment can be understood as complementary and deeply embedded concepts ([Tiwana & Konsynski, 2010](#); [S. P.-J. Wu et al., 2015](#)). However, realizing and fostering business-IT alignment has continued a pervasive management concern ([Luftman, Lyytinen, & ben Zvi, 2015](#)); that warrants researchers to consider alignment in a fresh approach ([Coltman, Tallon, Sharma, & Queiroz, 2015](#)). The prior studies evidence that the business-IT alignment is crucial to allow firms to maximize the benefit of IS investments and derive the value to the firm performance ([Chan, Huff, Barclay, & Copeland, 1997](#); [Papp, 1999](#); [Sabherwal & Chan, 2001](#)). Despite of its significance, the business-IT alignment has stayed elusive for many firms ([Luftman et al., 2015](#); [Preston & Karahanna, 2009](#); [Tallon, 2007](#)). Nevertheless, it is not well understood if and how some contextual factors shape to drive business – IT alignment on firm performance context.

2. Background and Literature Review

2.1 Managing IT and firm performance

It is quite true that IT investment can increase firm performance ([Turel et al., 2017](#)). However, investments in IT are not adequate by themselves to improve firm performance ([Y. Wang, Shi, Nevo, Li, & Chen, 2015](#)). Hence, it necessitates the practice of managing IT to generate its superior performance outcomes. The managing IT involves the activities e.g., planning, organizing, controlling, and directing the use of IT within an organization ([Boynton & Zmud, 1987](#); [J. Van Der Zee & De Jong, 1999](#); [Y. Wang et al., 2015](#)); that reached a significant concern among IS scholars, and executives ([Ilmudeen & Yukun, 2018](#); [Lowry & Wilson, 2016](#); [Mithas, Tafti, Bardhan, & Goh, 2012](#); [Tallon, Kraemer, & Gurbaxani, 2000](#); [Xu, Zhang, & Li, 2016](#)). The managing IT investment include processes like

developing, operating, implementing and maintaining financial controls over IT investments and expenses in line with IT strategic plans ([Centre, 2005](#)). The effective use of IT significantly depends on managing IT and governance practices which are highly important to its value creation from IT investment ([Ali et al., 2015](#); [Prasad, Heales, & Green, 2010](#); [S. P.-J. Wu et al., 2015](#)). In this belief, IT can have a positive effect, no effect, or even a negative effect on performance, in relation to how well IT is managed and governed ([Turel et al., 2017](#)). Firms can contribute to its performance having strong managing IT by orchestrating various business units activities, streamlining operation processes, reducing production cost, synchronizing IT and business units, regular checking of IT priorities, and timely allocation of IT assets ([Y. Wang et al., 2015](#)).

The traditional performance measures like ROI, net present value, internal rate of return, and payback method require monetary values. When they applied to IS the problem arises as IS regularly create intangible outcomes for IT investment like improved customer service, technical and managerial skills, unique or competitive advantage, knowledge-based assets that are challenging to quantify ([Wilkin & Chenhall, 2010](#)). Besides, the value of IT is perceived differently by various levels of management and users ([De Haes & Van Grembergen, 2015](#)). Accordingly, identifying how IT delivers value can be challenging as the benefits become absorbed into business processes, hard to measure IT at the business unit level, and less obvious at the level of financial reporting ([Wilkin & Chenhall, 2010](#)).

2.2 IT governance practices in the context of managing IT investment

IT governance is defined as “the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT” ([Van Grembergen & De Haes, 2009](#)). IT governance is a subset of overall governance responsibilities of the Boards and denotes the decisions about key IT activities and investments in the organizations ([Parent & Reich, 2009](#)). The effective IT governance is an active means to decrease risk, lessen the impact of IT-related failures, reduce the cost of capital, and make lasting shareholder value ([Parent & Reich, 2009](#)). With the effective IT governance framework, IT-enabled business investments are well managed and generate value, whereas the weak IT governance provides the same chance to destroy the value ([Centre, 2005](#)). The industry cases make shock stories for value destruction example, Nike lost over US\$ 200m failure in implementing its supply chain software, failures in IT-enabled logistics systems at MFI and Sainsbury vanished to multi-million pound ([Centre, 2005](#)). Today, IT serve a vital function, and almost all organizations depend on IT. This IT dependency causes executives to use IT governance practices in the decision-making process. There are reasons why IT governance has evolved as a field and exists on its own. Because, most of the organizations' IT investment

account for a larger portion of their budget, IT always referred to as a technical field which cannot easily be understood, and investment in IT and its value generation not visible for non- technical executives. Furthermore, IT investments are not able to create the apparent value unlike the business case, and IT itself is a complex, and it require governance to make transparency. Figure 1 illustrates IT governance frameworks and standard with their primary IT-related functions.

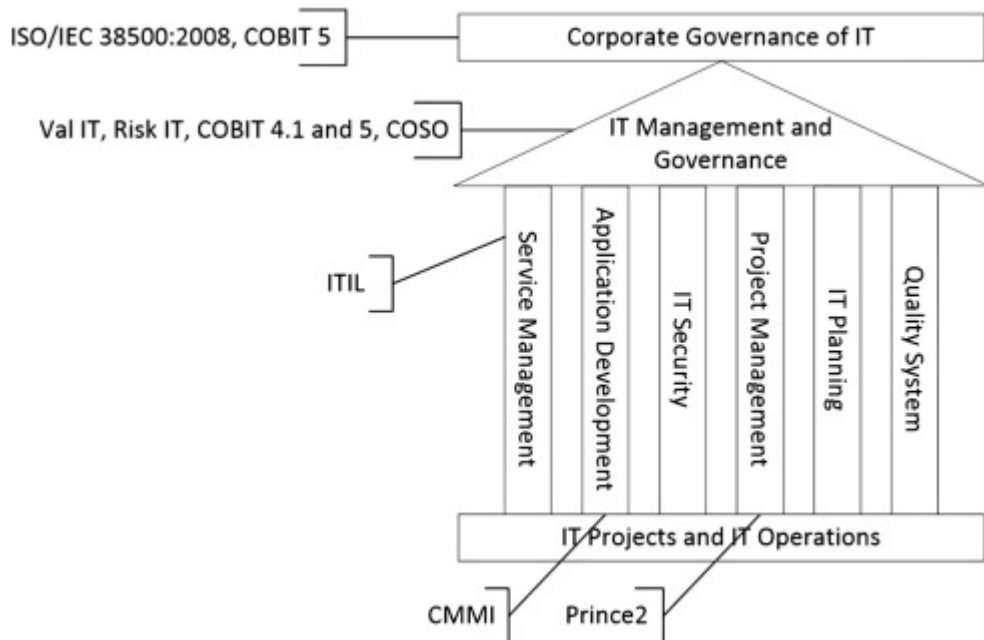


Figure 1: Frameworks and standard and their primary IT-related functions

2.3 Underlying theories

2.3.1 Resource-based view (RBV) of managing IT and firm performance

The Resource-Based Theory is broadly accepted as one of the foremost leading theories for describing, explaining, and predicting IT-firm relationship ([J. B. Barney, Ketchen, & Wright, 2011](#); [Rivard, Raymond, & Verreault, 2006](#); [Son, Lee, Lee, & Chang, 2014](#)). The RBV specifies that firm has a bundle of heterogeneous resources that are rare, immobile and hard to replicate, and these resources have the potential to offer a foundation for superior firm performance ([J. B. Barney et al., 2011](#); [Kearns & Lederer, 2003](#); [Tallon, 2007](#); [Turel et al., 2017](#)). Firm resources consist of all assets, capabilities, firm processes, firm attributes, knowledge, information, etc. ([J. Barney, 1991, p.101](#); [Rivard et al., 2006](#)). Similarly, a firm's resources and capabilities contain tangible and intangible factors, such as physical assets, human capital, and organizational routines and procedures ([Hwang, Yang, & Hong, 2015](#)). In IS literature, scholars have identified different

types of resources that are valuable for firm performance such as human, technological, and relationship resources ([Ravichandran, Lertwongsatien, & LERTWONGSATIEN, 2005](#)); IT-related resources such as infrastructure, human-IT resources, and IT-enabled intangibles ([Huang, Ou, Chen, & Lin, 2006](#)). Controlling over these limited resources, firms can become more profitable than their competitors and gain a competitive advantage ([J. B. Barney et al., 2011](#); [Ravichandran et al., 2005](#); [Seddon, 2014](#); [Turel et al., 2017](#); [N. Wang, Liang, Zhong, Xue, & Xiao, 2012](#); [Xu et al., 2016](#)). The growing body of IS literature is used RBV as the main theoretical background to elucidate why IT can be a source of competitive advantage ([Kearns & Lederer, 2003](#); [Melville et al., 2004](#); [Rivard et al., 2006](#); [Wade & Hulland, 2004](#); [F. Wu, Yenyurt, Kim, & Cavusgil, 2006](#)).

Under RBV, the notion of managing IT has articulated in numerous lens, For example; effective IT governance ([Wilkin, Couchman, Sohal, & Zutshi, 2016](#); [S. P.-J. Wu et al., 2015](#)), IT capabilities (e.g., IT management and IT technical skills)([Y. Chen, Wang, Nevo, Benitez, & Kou, 2017](#)), IT practices ([Turel et al., 2017](#)) and IS resources (e.g., IS planning and change management, and IS-business partnerships) ([Wade & Hulland, 2004](#)). In this belief, IT is presumed as a crucial part of business processes, and IT covers all business functions consequently, firm designs and recombines IT resources in the direction of alignment between business and IT functions that allows internal fit under RBV ([Turel et al., 2017](#)). Therefore, RBV emphasizes the managing IT empowers effective execution of IT and business strategies to grasp superior alignment that subsequently offers firm performance. Under RBV, the notion of managing IT investment has been articulated in various lenses such as effective IT governance ([Wilkin et al., 2016](#); [S. P.-J. Wu et al., 2015](#)), IT capabilities (e.g., IT management and IT technical skills)([Y. Chen et al., 2017](#)), IT practices ([Turel et al., 2017](#)) and IS resources (e.g., IS planning and change management, and IS-business partnerships) ([Wade & Hulland, 2004](#)).

2.3.2 Process theory supports IT business value and alignment

Despite the current theoretical models that highlight some common aspects especially cause-effect argument, [Soh and Markus \(1995\)](#) demonstrated how IT creates value in view of process theory (Figure 2). The process-based view renowned as one of the most common theories to explain how business value of IT contributes to realize firm performance ([Peng, Quan, Zhang, & Dubinsky, 2016](#); [Soh & Markus, 1995](#); [Tallon, 2007](#)). In this way, the process view of IT value cogitates IT investments as a necessary but not necessary condition for superior firm performance ([Hu, 2005](#)). Hence, the main idea suggested in process theory is that the IT investment improve firm performance subject to interaction among three processes. These processes are a) *IT conversion process* - IT expenditure becomes IT assets, b) *IT use process* - IT assets generate IT impacts, and c) *the*

competitive process - IT impacts are transformed into firm performance ([Soh & Markus, 1995](#)). Prior studies on the process-based theory advocate that IT investment creates a positive impact on performance by enhancing operational efficiency, facilitating intermediary business processes, and creating new business capabilities ([Hu, 2005](#); [Peng et al., 2016](#)). In addition, the process based view claims that IT creates value by enlightening individual business processes, or inter-process relations, or both for the organization ([Tallon et al., 2000](#)).

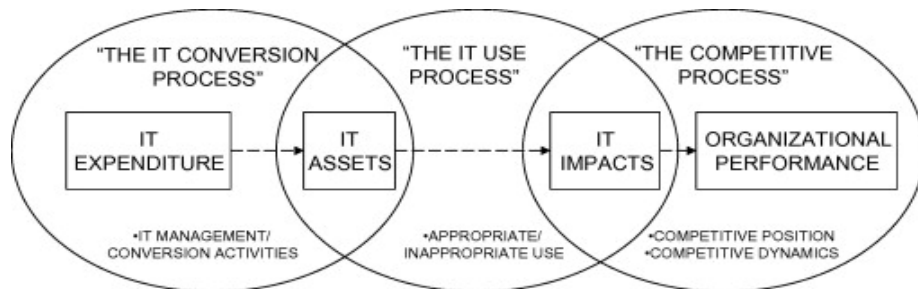


Figure 2 : How IT creates value model
Adopted from [Soh and Markus \(1995, p. 37\)](#)

The process theory is abstracted in two aspects in prior studies. (1) *alignment* – is the fit between business activities and IT strategy that in turn enhance IT business value, and that could support a deeper and meaningful understanding of how alignment affects firm performance ([Tallon, 2007](#)). (2) *Intermediate business processes* - firms derive business value from IT when IT and firm processes support each other. Thereby, greater synergy will be created; that in turn have a positive effect on intermediate process performance and firm performance ([Cao et al., 2011](#); [Mooney, Gurbaxani, & Kraemer, 1996](#)). For example in prior study, the intermediate capabilities such as business process management capability and supply-chain management capability fully mediate the impact of IT on company performance ([Peng et al., 2016](#)). In this study 1, researchers theorize and adapt the process-based view for two reasons. First, it allows IT investment to create superior value through managing IT practices to effect alignment, and its subsequent impact will influence on firm performance. Second, it facilitates the business and IT strategies to create an alignment that seems to be the intermediate process to transform the effect of management of IT investment on firm performance.

3. Results and Findings

Table 1 : Summary of prior studies for the effect of managing IT and business-IT alignment on firm performance

No	Authors	Theme of the study / Research objective / Research question	Findings
Managing IT			
01	Ilmudeen and Yukun (2018)	Examine the application of Val-IT 2.0 practice in managing IT (MIT) investment, and its mediating role between – Val-IT domains and firm performance.	Value governance, portfolio management, and investment management of Val-IT domains are significantly linked with MIT, and MIT found as a significant mediator.
02	Ali et al. (2015)	Examines the association of IT investment governance (ITIG) and corporate performance.	There is a significant and positive relationship exist between the ITIG and corporate performance.
03	Y. Wang et al. (2015)	How IT assets and IT management, interact to jointly impact on organizational performance	IT management capability can directly improve competitive advantage and firm performance whereas, IT assets do not.
04	Peng et al. (2016)	How information technology affects firm performance	firm's business-process management capability and supply-chain management capability to manage both its internal and external business processes. These two capabilities fully mediate the impact of IT on firm performance.
05	Lombardi, Del Giudice, Caputo, Evangelista, and Russo (2016)	Investigate the relationship between information technology and value creation	Val-IT framework combined with a decentralized model of IT governance lets companies to increase the possibility of selecting investments.
06	Mithas and Rust (2016)	How IT strategy and IT investments together effect on the firm's profitability and market value	Dual IT strategic emphasis firms have a superior market value than firms with either revenue or a cost emphasis. However they have similar levels of profitability.

No	Authors	Theme of the study / Research objective / Research question	Findings
07	Masli, Richardson, Watson, and Zmud (2016)	Examined the effect of IT-related absences on CEO/CFO turnover and CEO/CFO IT management responsibilities are identified.	CEOs believed to be responsible for global IT management duties, whereas CFOs believed to be accountable for demand-side IT management duties
08	Rahimi, Møller, and Hvam (2016)	Examine the under-explored link between business process management and IT management.	Propose that it require horizontal integration between business process management and IT management to enable strategic and operational business-IT alignment.
09	Boh and Yellin (2006)	The application of enterprise architecture (EA) standards affects management of IT infrastructure, data resources & applications across business unit	Results reveal that the use of EA standards are effective in helping firms to better manage their IT resources.
10	Boynton, Zmud, and Jacobs (1994)	Examine the key factors affecting IT use in large, complex organization.	Managerial IT knowledge is a dominant factor in explaining high levels of IT use; both managerial IT knowledge and IT-management-process effectiveness influenced by IT management climate.
11	Peppard et al. (2007)	How firms can increase the pay-off on IT investments, thus it offer an approach for planning, identifying, and managing the delivery of benefits.	Demonstrates that the better investment decisions and benefits-driven execution plans, lead to realize more benefits from IT investments.
12	J. T. M. Van Der Zee and De Jong (2015)	Examine the need to incorporate business and IT strategy for the IT value management.	Shows the balanced business scorecard as a valuable facilitator to implement an incorporated business and IT planning and evaluation process.
Business-IT alignment			
13	Liang, Wang, Xue, and Ge (2017)	Investigates how intellectual and social dimensions influence agility in reverse directions through distinct mechanisms.	Intellectual alignment hinders agility by increasing organizational inertia, whereas social alignment enables agility by improving

No	Authors	Theme of the study / Research objective / Research question	Findings
			emergent business-IT coordination.
14	Gerow, Grover, and Thatcher (2016)	Examine the unproven alignment's nomological network and why the tighter alignment may or may not lead to greater levels of firm performance.	Demonstrates that intellectual alignment influences operational alignment, and provide insight on how governance structure and social alignment effect intellectual and operational alignment.
15	Luftman et al. (2015)	Addresses the issues in alignment using a capability-based lens.	All alignment dimensions contribute significantly to alignment and demonstrate statistically significant impact on firm performance.
16	Gerow, Grover, Thatcher, and Roth (2014)	examine alignment paradox, conducted a meta-analysis to investigate the interrelationships between alignment, performance, and context constructs.	Alignment dimensions (intellectual, operational, and cross-domain) show unique relationships with financial performance, productivity, and customer benefit and with other constructs in alignment's nomological network.
17	Coltman et al. (2015)	Provides a historical review of the strategic IT alignment works over the past 25 years.	Focused on the theory, conceptualization, and the measurement of strategic alignment.
18	Yayla and Hu (2012)	Investigating alignment-performance relationship with the moderating roles of environmental uncertainty.	Positive significant effect exist alignment-performance in highly uncertain environments and varies across performance measures.
19	Ravishankar, Pan, and Leidner (2011)	Address gaps in IS alignment research-testing the influence of firm subcultures on alignment of KMS with firm strategy.	Shows the vital roles of three different subcultures such as enhancing, countercultural, and chameleon in the alignment of the KMS.

No	Authors	Theme of the study / Research objective / Research question	Findings
20	Preston and Karahanna (2009)	Developed nomological network to understand the antecedents of IS strategic alignment.	Shared domain knowledge, shared language, and structural systems of knowing effect the advancement of shared understanding, and it found as a major precursor of IS strategic alignment between the CIO &TMT
21	L. Chen (2010)	Assess the current state of business–IT alignment of companies in China.	Found link between alignment maturity dimensions and IS strategic alignment. Compared between 11 Chinese domestic & 11 multinational companies operating in China.
22	Tallon (2007)	A process-level perspective used to deeper understand how alignment affects firm performance.	Found a positive connection between alignment and perceived IT business value in the value chain each primary processes.
23	Bergeron et al. (2004)	Examine the ideal pattern of strategic alignment on business performance	Revealed that less performance firms shown a multifaceted coalignment pattern of business strategy, business structure, IT strategy, and IT structure that differentiated them from other firms
24	Byrd, Lewis, and Bryan (2006)	Investigated the influence of strategic alignment (between IS strategy and business strategy) on the return on IT investment.	Found that the synergistic link between strategic alignment and IT investment with regard to firm performance.
25	Kearns and Lederer (2003)	Investigates how strategic IT alignment can create superior firm strategies that generate competitive advantage.	Alignment between the IT plan and business plan was significantly linked to the practice of IT for competitive advantage.
26	Cragg et al. (2002)	Measured business strategy and IT strategy alignment among small UK manufacturing firms. Then examined the connection between alignment and performance.	Found significant amount of small firms had realized high IT alignment, it subsequently attained superior firm performance than the lower

No	Authors	Theme of the study / Research objective / Research question	Findings
			IT alignment firms
27	Sabherwal and Chan (2001)	Studied the influence of alignment on perceived business performance using defender, analyzer, and prospector business strategy classifications.	Alignment seems to affect overall business success in Prospectors and Analyzers but not in Defenders. Alignment affects perceived business performance only in some firms.
28	Tallon et al. (2000)	Developed a process-oriented model to measure the effects of IT on critical business activities inside the value chain.	Firms with more focused goals for IT identify better payoffs from IT across the value chain. Strategic alignment and IT investment assessment bring higher IT business value.

4. Discussion

Businesses have invested a massive amount of money in IT; however, the payoff from IT is always a major concern for managers and executives. In spite of the growing amount of IT investment, managing IT and IT governance decisions have ever more become complicated due to vague cost relationships, uncertain payoffs, rapid technological changes, and uncertain business environments. Business-IT alignment is higher when firms are applying a mix of mature IT governance practices ([De Haes & Van Grembergen, 2009](#)), and adopting IT management practices that ensure the closer alignment between IT and firm's business goals ([Tallon et al., 2000](#)). The IT investment cannot realize its desired outcomes if a firm does not manage its IT assets thoroughly and the effect of IT on firm performance is subject to relations between IT and business processes ([Soh & Markus, 1995](#)). Hence, researchers posited in this study that management of IT investment is the firm's management capability that enable to align the firm's business and IT strategies to achieve superior firm performance.

The business-IT alignment drives firm performance when realizing the alignment ([Preston & Karahanna, 2009](#); [Sabherwal & Chan, 2001](#); [Tallon et al., 2000](#)), and fit between IT and business strategies ([Bergeron et al., 2004](#); [L. Chen, 2010](#); [Cragg et al., 2002](#)). Further, a firm with well aligned IT and business strategies can invest in extra IT resources with the guarantee that they will be leveraged significantly ([Byrd et al., 2006](#)). Moreover, the study of [Tallon et al. \(2000\)](#) found

that firms whose IT was closely aligned with the business strategy had higher perceived payoffs from IT, in contrary when firms' strategic alignment is weak the perceived IT payoffs were significantly lower. Over time, prior studies have also documented numerous antecedents that impact alignment, for example, shared understanding between business and IT ([Preston & Karahanna, 2009](#)), strategic direction ([Sabherwal & Chan, 2001](#)), and IT governance mechanisms ([S. P.-J. Wu et al., 2015](#)). Likewise, this study proves that management of IT investment is the antecedents of business-IT alignment, that in turn directs to achieve firm performance.

5. Conclusion

Regardless of the increasing amount of IT investment, through what mechanisms the impact of IT governance and management of IT investment drives firm performance is still not clear. This study systematically reviews the antecedents of business-IT alignment on the firm performance context. This review study shows that the business-IT alignment is derived by the IT governance and managing IT investment practices to achieve firm performance. This study suggests that firms cannot simply attain performance by merely investing in IT instead firms should focus on effective management of IT practices and strategically align their business and IT strategies. This study contributes to IS literature with the richer view on the IT governance, management of IT investment, business-IT alignment, and firm performance.

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