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Review of Information Technology (IT) in Business Matrix

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ABSTRACT Significant research has been conducted to elaborate on Information Technology Governance (ITG). However, less has been covered to assess the empirical role of ITG concerning the business matrix, mainly consisting of two integral parts, that is, its description and effective measurements. In order to prescribe ITG and its effectiveness for organizations, the current study conducted systematic literature-based research to identify strategic methods and structures. These methods and structures may be helpful in understanding the combined comprehensive role of ITG for corporate effectiveness. To classify the role of IGT governance and international business in shaping a firm's digital capital and asset strategies, this study highlights the necessity of IT-governed decisions for achieving positive returns. This study also demonstrates the connection between ITG and stakeholders dependence on the digital market.

INDEX TERMS digital capital, effective measurements, information technology governance (ITG), strategic methods

I. INTRODUCTION

Indeed, to ensure that IT-governed organizations are properly governed by Information Technology Governance (ITG), information technology (IT) and strategy governance (SG) were introduced as a collective transforming strategy to meet the recent changing demands of businesses. ITG has emerged as a challenge for the effective implementation of business strategies with technological and internet governance for more international businesses (IB). Van Akkeren [1] in his study, indicated ITG as "the leadership and the organizational structures, processes, and relational mechanisms, which ensure that an organization's IT sustains and extends its strategy and objectives". However, the current study utilized two prior definitions of previous scholars to define ITG:

Scholars	IT-Governance Defined
Board Briefing	The oversight of ITG falls under the purview of the Board of Directors and executive management. It forms an essential component of the overall enterprise governance, encompassing leadership, organizational frameworks, and procedural measures. These elements collectively ensure that the organizations IT functions align with and further its strategic goals and objectives.

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Scholars	IT-Governance Defined
Van Grembergen	ITG denotes the collective organizational capability of the Board, executive management, and IT leadership to regulate the development and execution of IT strategy, thereby facilitating the integration of business and IT operations.

Even though, these definitions are contextually different, however, in some aspects, they focus on similar key issues. These key issues include association between IT and governance, prime responsibility and key roles, and strategy and effective IT management. The basic objectives of ITG are stated below:

- Aligning IT strategy with business goals

- IT decision-making

- IT risk management

- IT performance management

- IT as a strategic/financial resource

Similar to Van Akkeren [1] definition that draws attention to IT management and governed mechanism, the current research concentrated on IT demands and future scope of IT-G and strategy. Additionally, need to adopt a governed approach in any organization which would involve dealings as [2]:

- Discipline

- Transparency

- Accountability
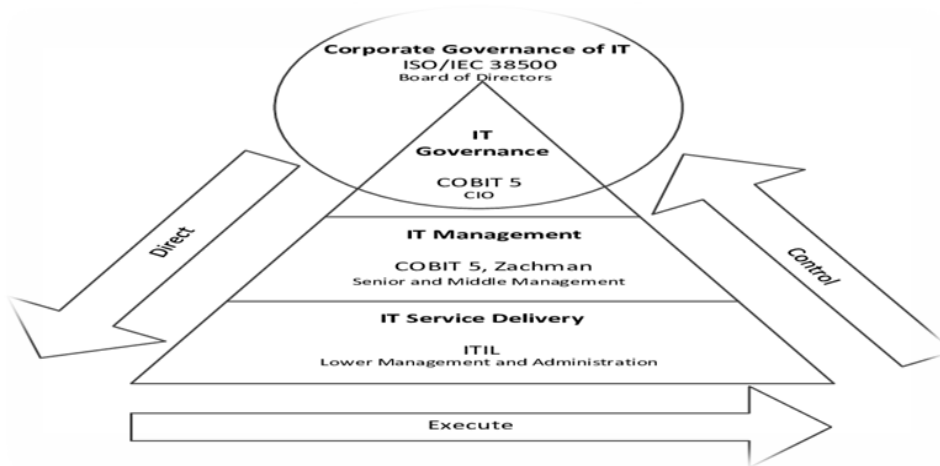
- Fairness

- Responsibility

FIGURE 1. Corporate Governance of IT

Figure 1 indicates corporate governance in IT-based organizations. The above Figure clearly designates that there are three steps that are directly linked to corporate governance of IT. It refers to a set of processes, strategies, and their alignment in an organization. These steps include execution and control which would deliver direct outcomes in any corporate-governed IT business model. It primarily focuses on

how a company is directed, controlled, and is accountable for its stakeholders.

II. LITERATURE REVIEW

A. CONCEPTUALIZATION OF IT IN RESEARCH: TRACING HISTORICAL FOUNDATIONS OF IT IN BUSINESS MATRIX

For several years, a rich body of information systems (IS) literature has explored transformations, such as "a process that engenders a qualitatively different organization" [3]. IT scholars have argued pertaining to the significance of IT-transformed organizations and functional strategies in order to have an aligned business model [4]–[6]. Moreover, recently, scholars have challenged this "alignment view" [7], stating that digital technologies shape business strategies. Henderson and Venkatraman [7] further highlighted the strategic role of IT in the existing business models [8]. Likewise, [5] were of the view that IT, as a tool, can be leveraged to align organizations with their specific strategic roles and objectives. The recent development has indicated a positive effect on IT-based business models.

The conceptualization of IT, as indicated by scholars, has substantially shaped IT as a business process reengineering. The term further indicated that when managers implement IT strategies for business "revolutionization", deep structures and core values can be achieved with the existing control mechanisms in any organization which leads towards IT-business alignment. Figure 2 below illustrates the role of IS in business trajectory, indicating how IS supports business strategies for effective IT-based performance.

FIGURE 2. Fundamental Roles of Information Systems (IS) in Business

The existing body of literature on digital technologies (DT) parallels the prior literature on IT that conceptualizes the recent changes which align with business outcomes. Hence, the question that remained unanswered is how DT and IT are associated with each other in terms of revolutions. Vial [9], in his study, argued that DT is a revolutionary step for any business model. However, Hart and Hess [10] highlighted a blurry boundary that exists between both DT and IT which makes it hard for managerial decisions to align with the organizational trends. Whereas, much of the literature highlighted the strategic significance of DT and IT. Organizational identity offers a wide conceptualization of digital technologies

having different propositional values [11]. Several examples have highlighted as to how an organization can transform itself into a leading business model. For instance, Netflix changed its identity from a rental movie provider into a streaming website, indicating an organizational identity.

TABLE I

KEY CONSTRUCTS OF IT-BASED CONCEPTUALIZATIONS

Construct/Indicator	Conceptualization	Source
IT-Process of Decision Making	It embodies the boards accountability in matters related to IT, chiefly encompassing the authority to determine the level of investment in IT and the prioritization of IT initiatives.	[12]
Process of IT Planning	It pertains to the actions aimed at achieving IT objectives, encompassing the delineation of IT planning, processes, and goals, assessment of the existing IT landscape and strategic alternatives, identification of the optimal IT strategy, and subsequent planning and execution of IT strategy implementation.	[13]
Process of IT Infrastructure Modernization	It entails the process of modernizing the IT infrastructure to support shared IT services, serving as the backbone of its IT capabilities. This involves determining the critical infrastructure services essential to achieve business goals, deciding whether to implement them across the entire organization or outsource them along with ensuring the continuous updating of these foundational technologies.	[14]
Process of IT Service Delivery	It involves the process of providing IT value and services, with a focus on maximizing cost efficiency.	[15]
Process of IT Monitoring	It refers to the activities responsible for assessing and monitoring IT initiatives and IT resource investments. It involves establishing key performance indicators, IT metrics, and business metrics.	[11]
Goals of Internal IT	It encompasses the tasks of evaluating and overseeing the IT initiatives and investments in IT resources. This entails setting up key performance indicators, IT metrics, and business metrics for measurement and monitoring purposes.	[9]

Construct/Indicator	Conceptualization	Source
IT Goals of Learning and Growth	They denote the motivation of IT personnel and their readiness to embrace innovation.	[13]
IT Goals for Customers	They relate to the companys performance from the customers viewpoint and encompass the IT resources that provide value directly to customers.	[16]
IT Goals (Financial)	They pertain to the alignment of IT with business strategy, managerial involvement in IT decision-making, and the management of IT risks and benefits.	[17]

Significantly, after reviewing the prior studies, some essential key IT-enabled capabilities were identified, including ability, design, implementation, and leverage that can improve IT performance, ultimately expanding business performance. The factors highlighted in Table I were originally indicated as outcome data collected from 881 companies. It suggests that ITG and IT performance are associated with each other and have a positive relationship. Moreover, the implementation of IT strategies ensures better ITG performance.

B. UNDERSTANDING IT-GOVERNANCE (ITG) AND ITS STRUCTURES

Effective ITG can only be achieved through effective IT-based decisions. The firm's IT resources can only be represented if it invests a significant amount of capital in these resources. It is evident that if a firm's capital percentage is half of the total firm's budget, the firm is expected to compete in the digitalized world, adopting transformative strategies [18]. Pragmatically, while implementing IGT in an organization, organizations must consider its internal and external factors. Therefore, understanding the right structural framework for any organization is important, as it is not necessary that any framework would equally work for any organization. This indicates that organizations must consider their key internal and external factors to choose the right framework for ITG. Significantly, Figure 3 indicates Peterson's framework for ITG.

TABLE II

Structures, Processes and Relational Mechanisms for IT Governance

Integration Strategy	Structures	Processes	Relational Mechanisms	
Tactics	IT Executive and accounts Committee and councils	Strategic IT decision-Making Strategic IT Monitoring	Stakeholder Participation Business IT-Partnerships	Strategic Dialogue Shared Learning

Integration Strategy	Structures	Processes	Relational Mechanisms
Mechanisms	• E-Business Task Force • E-Business Advisory Board • Project steering committee • CIO on board • IT Organization Structure • IT Strategy Committee	• IT governance maturity models • Business IT alignment models • Strategic alignment models • Information economics • Service level agreements • Information System Planning	• Partnership rewards and incentives • Business IT colocation • Collaboration between principal stakeholders • Active participation by stakeholders	Cross-functional business IT Job rotation Cross-functional business IT Training Active conflict resolution Shared understanding of business/IT objectives.

The above figure depicts the structures and responsibilities for the IT-based executives. The process discusses the importance of decision-making and monitoring which includes IT participation, IT committee, strategic dialogue, efficient working environment, and effective communication.
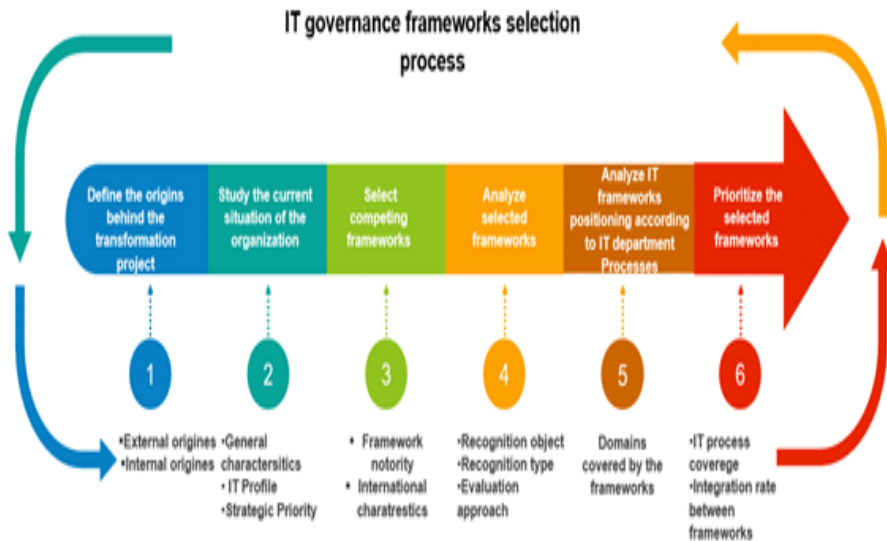

FIGURE 3. IT Governance (ITG) Framework Selection Process

C. IT-GOVERNED ORGANIZATIONS

IT-governed organizations depict the effective function of organizational values where the sole authority to make IT decisions lies within an organization or firm. Several past models and frameworks have indicated a centralized and decentralized federal structure that can be a hybrid model to achieve both efficiency and standardization for effective ITG. IT-governed businesses ensure that they efficiently utilize executive management and IT management to ensure IT governance. Thus, the implementation of a well-defined and clear IT decision-making process engages and commits the board members to allocate the right amount of budget and invest in IT. Similarly, making the right IT strategic choice would enable IT businesses to align with IT-governed strategies, thus, prevailing ITG performance [19], [20].
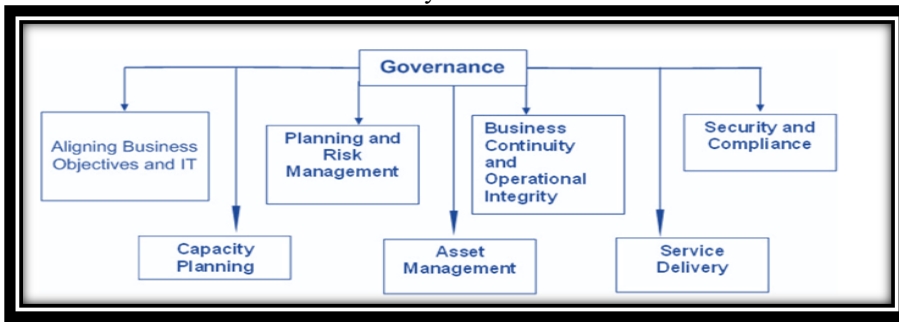

FIGURE 4. Roles of Information Technology Governance (ITG)

[21] elaborated on ITG capacity as a firms ability to identify and implement IT resources concerning IT-business metrics, namely IT decisions, which indicate the decision right and authority of how much an organization invests in an IT-based model. Figure 5 indicates how governance and IT performance tend to enhance businesses through defined strategy. Similarly, the internal and external business factors are crucially important in determining higher IT performance which solely lies on IT workforce, skills, expertise, and abilities to achieve IT-business strategic decisions, thus, prevailing effectiveness in organizational performance.

D. IT-GOVERNANCE (ITG) FRAMEWORKS

There are five ITG frameworks that can be used, namely COBIT, ITIL, CMMI, PMBOK, and TOGAF. However, only the first one and the most recent frameworks have been focused upon to indicate the best IT practices for organizations.

1) STRATEGIC ALIGNMENT MODEL (SAM)

Previous literature has indicated that firms cannot compete in market if their businesses and IT strategies are not aligned. Conversely, it is argued that strategic alignment (SA) positively influences IT effectiveness and its hamper can seriously affect a firm's performance and its viability [12], [21], [22], developed their SAM based on strategic management of IT in any organization. Furthermore, the interrelation of business and IT strategies was also described which must be coherent in any business's internal and external domains. Two major functional integration were also highlighted that coexists with each other,

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namely strategy and IT strategy where operational is the internal domain and strategic advantages are the external domains of any organization. For them "Historically, the notion of "linkage" has often been evoked as a metaphor advocating for the integration of business and information technology strategies, lacking sufficient articulation or clarification of its defining characteristics" [23].
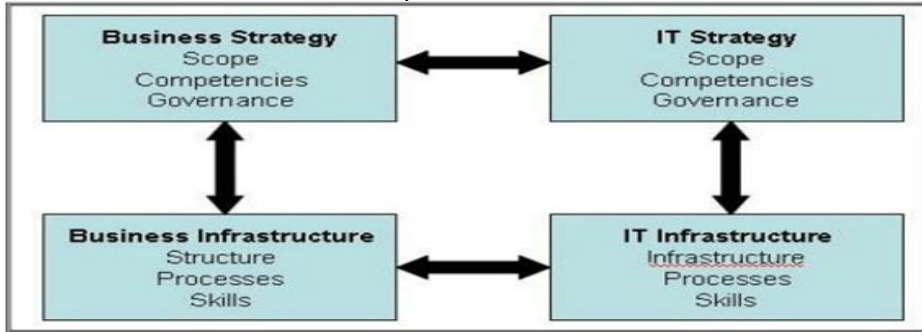

FIGURE 5. Strategic Alignment Model (SAM)

Though, SAM was continually aligned, however, it failed to deliver a practical framework mechanism for business system planning and critical success factors. Two strains of thoughts were identified in previous literature, firstly, by Ramlaoui [24] who defined and reviewed the original model, and Secondly, by Maes [23] which together enhanced the framework to reflect upon the recent information. However, this proposed framework was further refined and separated from information and communication to stress the significance of information delivery. See Figure 7 below:
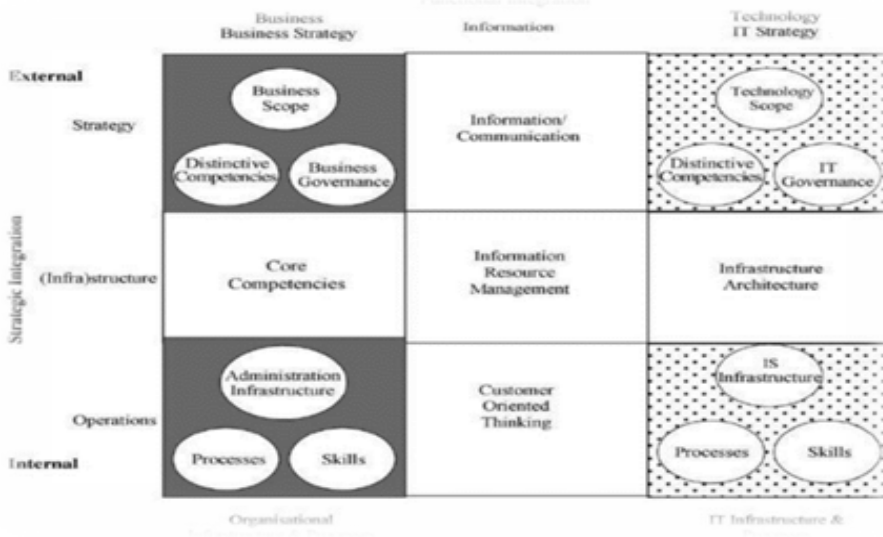

FIGURE 6. A Generic Framework for IM [24]

This model is solely based on two building blocks, that is, strategic fit and integration. It is evident that strategic integration is directly linked with IT strategy which reflects the external components of operational strategies. Additionally, operational integration is the association between organizational infrastructure and the process of IT-based frameworks. This model was intuitively attractive, however, the committee had reservations regarding the potential implementation of this model on a firm and its outcomes [25].

2) EFFECTIVENESS OF COBIT AND ITIL

IT utilization and business model together work for the foundation of any organization's effective ITG. ITGI can be used to achieve the desired business outcomes, COBIT is the highest level of ITG that provides an overall control framework based on IT model. This standardized process helps organizations in managing their progress ensuring ITG [26]. COBIT and ITIL both play an essential role in terms of ITG. COBIT provides an overall governance framework to most organizations, whereas ITIL is more focused on service delivery and management in any organization that deals with suitable solutions for effective ITG strategies. ITIL only covers specific areas, however, COBIT is used as an overall mapped framework to enhance the hierarchy procedure. Additionally, research has indicated that when both are used together, they can amplify the ITG goals of any organization or firm. Figure 8 below shows a graphical comparison of both frameworks.
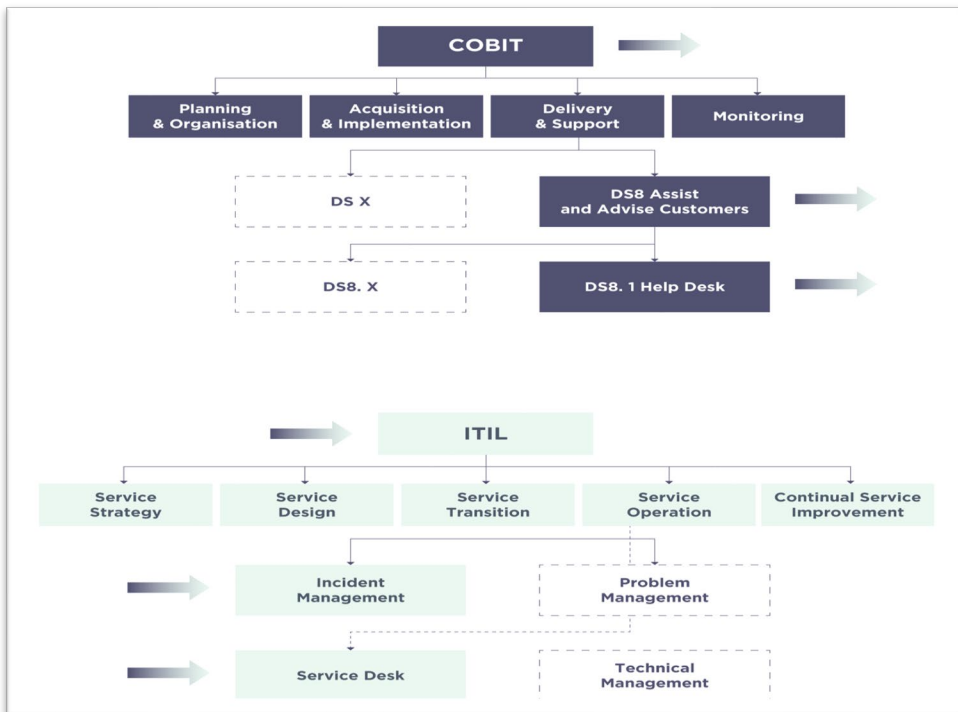

FIGURE 7. COBIT and ITIL Framework

3) STRATEGY AND GOVERNANCE MATURED MODEL

Governance refers to the framework, structures, and principles that lead and monitor a set of directions to perform and align with the overall objectives of an enterprise. ITG is a subset of corporate governance which requires board levels/committees for the implementation and alignment of IT with business goals. To measure the alignment between strategy and governance, organizations opted for a matured model. Significantly, organizations/firms utilized this method to grade or assess the level of their maturity in order to optimize their business performance. To effectively measure the alignment of governance and IT, organizations can use the maturity model to set the benchmark and to optimize their organizational performance. Furthermore, framework guidelines can be followed according to the ITG framework being applied to any organization. Figure 9 below clearly indicates the abiding connection between ITG capability and IT performance which solely lies in the size of an organization and its budget.
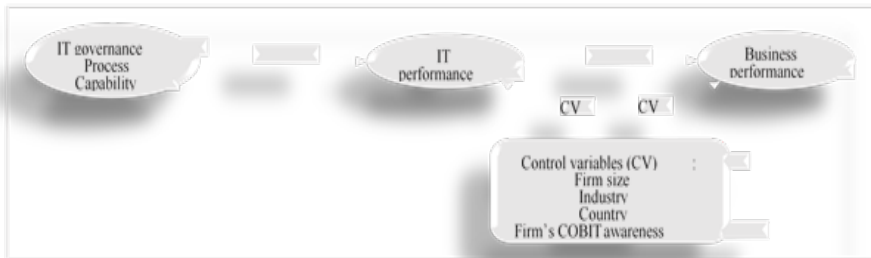

FIGURE 8. ITG Variables

Moreover, maturity levels are applied in advanced stages and are not applicable to firms struggling with budget and other operational tasks. However, other firms can follow the IT governance maturity model indicated by IT Governance (ITG) Institute in Figure 10.
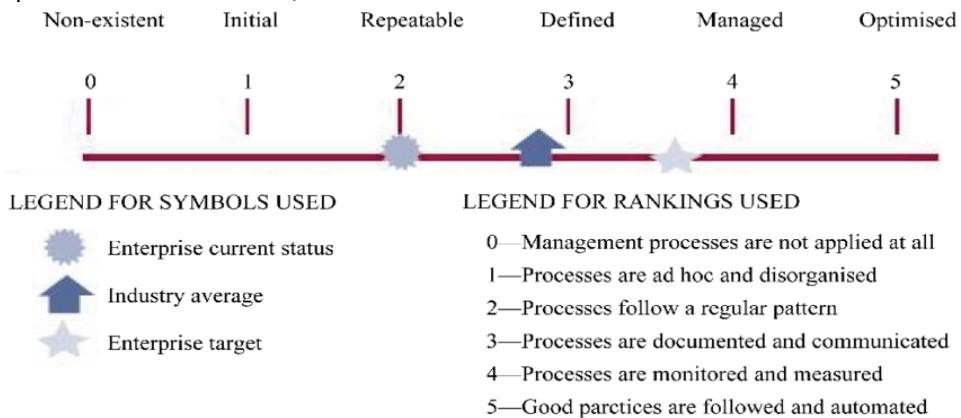

FIGURE 9. IT-Governance (ITG) Maturity Model

III. CONCLUSION

The current study concluded that IT and strategy governance play a pivotal role which enables the organizations to harness their potential while effectively managing various risk factors. ITG is the constructive alignment of IT with business to achieve business values. Therefore, the current study introduced IT and strategy governance as crucial parts of any enterprise. Additionally, this study also reviewed previous literature, concerning various business establishments to understand the IT-based frameworks that opted for ITG. Moreover, it was also identified that ITG plays a critical role for any business that assures IT framework as a mature technique and which may help the organizations outperform their competitors [13]. Additionally, prior literature has indicated that quite less has been researched on IGT, however, it encompasses a heterogeneous mixture of structure, frameworks, and processes that are key governance mechanisms.

The aforementioned mechanisms, such as, understanding the structural process, implementing ITG, decision-making, and risk management can help collectively to contribute towards achieving an IT-based governance strategy. This strategy would significantly empower the organizations to achieve their corporate governance goals. Moreover, with the successful implementation of these mechanisms, organizations would be able to compete in the digitalized world with efficacious strategy governance that is aligned with their business objectives and would provide them with the desired outcomes. Hence, utilizing established frameworks, namely COBIT and ITIL would provide a more structured approach for organizations to achieve their professional goals.

CONFLICT OF INTEREST

The author of the manuscript has no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

DATA AVALIABILITY STATEMENT

The data associated with this study will be provided by the corresponding author upon request.

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