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BUSINESS PROCESS PERFORMANCE: BREAKING SILOS THROUGH STRATEGIC ORGANIZATIONAL CONVERSATION

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To: Dean William G. Hardin
College of Business

This dissertation, written by Hope Euginia Greene, and entitled Business Process Performance: Breaking Silos through Strategic Organizational Conversation, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

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Florida International University, 2024

DEDICATION

This is for my two beautiful premature kids who have grown into adults, Kir-kia D. A. Davila (Love) and Brexton T. Belus (Brave) as well as my grandchildren Malachi McKale Lewis and Senai Hope Lewis. You are evidence that a teen parent could survive and thrive. Thank you for the love, support, and motivation your presence and voices provide. EVERYTHING I do and have done… was with you in mind. Love isn't a strong enough word for how much you mean to me. To my mother Eliza A. Scott Greene (widow and the original teen mom of ten), I did not understand the decisions you made and how much a mother would give up for her children until I had my own but know your life is a lesson well taught and received. To my father Richard "Shug" Green, everyone knows I'll always be Lil Shug. I cannot express enough... that God is strategic in how he gave you and me time together for the first 5 years of my life and the last five years of yours. Daddy, I miss you with EVERY FIBER of my being. To my brothers Roscoe, Percy, and Alphonzo Greene, don't give up because even your mistakes in life are lessons learned for those who come after you. To my sisters Gloria Greene Calloway, Roveania J. Greene, and Kawai I. Greene, thanks for sharing with me when you could and becoming women for whom your children can depend. Although gone, you are not forgotten, Lula A. Greene (sister), you taught me to stand up and speak up. Richardeen Greene (Sister), you gave me laughter. James A. Greene (brother), what can I say… you taught me strategy. Y'all this was a herculean effort to take on and complete, but our family can say, "We got one!". And lastly, I dedicate this research to the Almighty God, thank you for protection, guidance, strength, power of mind, and for giving and sparing my life. All of this I offer to you.

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To all my Florida International University professors, thanks for leading me through this process. I am proud to say that this is my third degree from FIU and every time was the charm. God bless you all!

ABSTRACT OF THE DISSERTATION

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This study investigated the factors that impact business process performance and whether or to what extent constructs like organizational agility, process modularity, knowledge absorptive capacity, top management mindfulness, and internal controls effect process performance. Despite the considerable importance of a comprehensive and holistic approach to business process performance, little is known regarding the state of the research on alternative performance indicators and their operationalization with respect to evaluating the performance of an organization's work routines. This research collected survey data from a sample of 339 US workers at small, medium, and large US companies. Results from partial least squares structural equation modeling show that the organizational agility, process modularity, knowledge absorptive capacity, top management mindfulness, and internal controls had a positive relationship with business process performance. Our findings have implications and point to directions for further research in this area. Based on this research, organizations will understand the need to exercise a high degree of attentiveness when exploring resolves for the affecting factors when establishing their baseline business process design and performance

measures. The paper contributes to the growing empirical literature on business processes, business process performance, modularity, and internal controls.

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CHAPTER 1: INTRODUCTION

Setting & Problem

The business processes of the Covid-19 period that occurred in early 2020 experienced a collapse (Widarti et al., 2020). As a consequence, business processes and its performance has reemerged as one of the most important topics since the Covid-19 disruption. Much of this disruption was due to process stalling and/or the inability of human resources to execute and manage processes under a mandate to be remote. Chan (2003) states that the success of a business process in a company is the employee who will carry out the business process (Widarti et al., 2020). Due to this fact, no matter the size, industry, or country, all businesses can fail when processes are disrupted for an extended amount of time hindering successful process performance.

Because of organizational processes freezing or not being accessible for execution, businesses began taking a strategic deep dive into the fundamental elements of business processes and potential framework that could support or increase process performance. Because of large interest in business processes, there is a great deal of variety concerning the definitions of processes and process redesign (Tinnila, M. (1995); Davenport, (1993); Davenport & Short, n.d.; Hammer & Champy, (2009); Johansson et al., (1993); Pall, (1987); Scherr, (1993). This interest can create an opportunity for stabilized processes and increased process performance if company principals have a process-oriented mindset. Process orientation is fundamental to the identification of core processes and looking at their end-to-end as well as cross-departmental functionality in a strategic manner. A process lifecycle is usually integrated to provide structure and as a strategic tool to support process identification, defining, designing and modularizing, and

configuring of business processes. Leaders without a process-oriented mindset and those who do not implement process lifecycle responsibilities may see performance suffer as well as company goal achievement of effectiveness and efficiency of operations. The business process lifecycle activities roles and responsibilities support process orientation including the strategic initiative to define, design, configure, and deploy modularized processes to increase process performance. Process modularization is a form of organizational design that creates a high degree of independence or "loose coupling" among business processes (Sanchez and Mahoney 1996). If businesses desire continuity, business process lifecycle documentation of every phase is imperative to the attainment of consistent business process performance. Good and thorough process documentation is the basis for process performance measurement, analysis and improvement (Willaert et al., 2007).

Micro, small and medium enterprises were the sectors most vulnerable to the impact of the corona virus pandemic (Widarti et al., 2020). According to Hertati and Safkaur (2020) these sectors can no longer be a buffer for the economy like during the 1998 and 2008 economic and financial crises. Thus, all organizations had to sure-up their processes, innerworkings (internal controls), and address process performance for achievement of objectives in effectiveness and efficiency of operations prior to the next crises. To ensure that all stakeholders' interests are protected, various mechanisms are put in place by corporate executives one of which is the internal control system (Tetteh et al., 2022). Companies find it a responsibility to prepare, inform and sensitize their workers on how to use internal control mechanisms as their success relies on the expertise and efficiency of the individuals who use them (Abiodun, 2020). These human resources are

the part of companies lifeline to stabilized processes and continuous performance during market disruptions, environmental uncertainty, pandemics, picketing, walk-outs, etc.

Disruption pushed company senior management to reassess the value and agility of its resources and two of the most important ingredients in their competitive advantage recipe, its workforce, and operational processes continuously performing. If either of these ingredients fails or disbands during disruption due to lack of agility, company performance (financial, organizational, operational processes, etc.) dissipates. An agile competitive environment is where the people skills, knowledge and experience are the main differentiators between companies (Goldman, 1995). Therefore, the skillset and flexibility of tangible and intangible resources can make the difference during difficult times. Before the next phenomenon, management will need to evaluate and consider knowledge acquisition and absorption. What human resources understand internally and externally and how they assimilate information is critical to process performance steadiness and analysis. According to Ferraris (2018) and Scuotto, Del Giudice, Bresciani, & Meissner (2017), organizations may need to invest in knowledge acquisition from sources internal or external to the firm to lead to an improvement in innovation performance and the way in which value is created and captured.

Significance of the Problem

In the world of environmental uncertainty, there are outer lying efforts (protests, pandemics, market crash, etc.) that interrupt operational processes and process performance throughout the US and beyond. So, it is inherent that business process performance is affected due to disruption (Alfaadhel et al., 2023). Business process performance is operational efficiency of inter- and intra- organizational processes which

can measure the financial and non-financial flexibility, reliability, responsiveness, and costs/assets of organizational and operational capabilities (Aydiner et al. (2019); Kim, Gimun, Bongski Shin, and Varun Grover (2010); (Bernhard, Peter, Zoltan, & Maria-Luise (2006). When most operational processes either cannot be executed, nor managed, or have limited management leaving demand for the majority of services and goods unanswerable and unable to be provided, process performance deficiency is the result. Processes are at the center of today's and tomorrow's competition (Willaert et al., 2007). According to Porter (1985, 1966), business processes are the transformation processes that an organization uses to create value, and strategy rests on these unique and coordinated activities (Porter, 1985, 1996). They are a set of interrelated resources and activities which transform inputs into outputs with the objective of adding value (Melao & Pidd, 2000). Because there will always be a phenomena or crises to test an organization's agility and disrupt a business's communication channels and internal controls, value creating processes need to be identified and stabilized for better process performance and business continuity. Al-Matari, Al-Swidi, Faudziah and Al-Matari (2012) noted there was a noticeable lack of research into the direct integration of internal control systems and firm performance in both developed and developing countries.

In calm or chaos, when carrying out a good business process, reliable employees are needed so that the business processes can be carried out properly (Braz et al. (2011). According to Willaert et al. (2007), people are a company's most important asset and should be required to train and to think in terms of processes. The knowledge, experience, and skillset possessed and brought to work daily by resources who work in essential functions to keep daily operational processes continuous is immeasurable,

probably imperfectly imitable, and rare. Marr et al. (2003), defines: "Human Capital contains knowledge assets provided by employees in forms of skills, competence, commitment, motivation and loyalty as well as in form of advice or tips." The amount of agility and knowledge it takes for the workforce to manage organizational processes during turbulent times is insurmountable and vast. In preparation for future environmental disturbances that could disrupt process performance, organizations may need to consider alternative process workflows and accountable resources. Therefore, processes owned by various organizations or functional areas may need to be modularized to have the most operational effectiveness and efficiency. Process modularization is the extent to which the production process is separated into standardized modules that can be easily re-sequenced into new processes that fulfill the requirements of producing new product features (Feitzinger and Lee, 1997). This design technique can be crucial for organization survival during environmental uncertainty. A modular process can help a firm to increase flexibility through re-sequencing and postponement, and reduce costs through standardization (Feitzinger and Lee, 1997, Gualandris and Kalchschmidt, 2013; Van Hoek and Weken, 1998).

During turbulent times, process' operational efficiency and performance can be nil. According to (Kim et al., 2010), business process performance is the operational efficiency of inter- and intra- organizational processes. As witnessed in the last global disruption, executives in every industry became frantic looking for agile solutions to process management in the aftermath of disruption. Clearly, business process performance was not at top of mind. Mindful leaders and persons respond to changes in his/her environment and creates new or improved processes (Langer & Moldoveanu,

2000) to support operational efficiency. Good leaders understand and knows who (critical personnel) in the organization are essential and carries out business activities (i.e., accessing, reviewing, completing, or managing functional business processes); knows the essential processes that has to be completed by departments; and knows the critical, value-based processes automated and manual to be completed.

When there is a crises afront stemming from a local, national, or global disruption, many organizations lose access to processes (coordinated activities) and this means value cannot be added and operational strategy rests on these unique chains of events. These 'chains of events, activities and decisions' are called processes" (Dumas et al. (2013); Van Looy & Shafagatova (2016). Top management spearheads, discusses, and provides the leading business strategy and goals to be attained utilizing these coordinated activities that they cascade throughout the organization. Hence, organization leaders need to openly discuss, outline, and come to terms with worker activities, internal controls efforts, and agility, as well as internal and external knowledge sources so much so that they are able to establish and modularize chains of events whose performance may be diminished during disruption. Whether yesterday, tomorrow, or in this moment, leaders will need to realize that they need to holistically understand their inner workings and solidify internal control mechanisms in order to prepare before the next crisis. Internal controls can lend itself to manual executive supervision for small firms alone, but the more sophisticated the companies and the more personnel and procedures it has, the more features the system needs to provide that can allow management to ensure the internal controls are in place and operate as expected (Abiodun, 2020). The business' internal control system is an important mechanism for proper and responsible management in all

types of companies (Abiodun, 2020). Now more than ever, leaders need the ability to focus tightly on short-term issues while simultaneously envisioning their long-term strategy (*2023 AlixPartners Disruption Index | Growth Leaders*, n.d.). They need to develop a bi-focal mindset as it relates to disruption. A critical part of a bifocal (short-term vs long-term) capability is understanding what the major disruptive forces are, which will affect our company most, and what the effect on industry dynamics is likely to be in both the short and long run (*2023 AlixPartners Disruption Index | Growth Leaders*, n.d.)

Research Gap

While there has been reporting on business process performance measures, there is still a gap. Despite the considerable importance of a comprehensive and holistic approach to business process performance, little is known regarding the state of the research on alternative performance indicators and their operationalization with respect to evaluating the performance of an organization's work routines (Van Looy, Amy & Shafagatova, Aygun, 2016). This begins with the organization breaking the functional silos of daily operations by understanding human resource process involvement, roles, origination of processes, identifying, and defining all critical processes, and orientation and engineering of cross-functional operational processes so that process performance criteria can be established. Although the selection of appropriate performance indicators is challenging for practitioners due to the lack of best practices, it is also highly relevant for performance measurement (Van Looy, Amy & Shafagatova, Aygun, 2016).

From top management down to individual contributors, functional workshops must be conducted about the possible factors that could affect process performance at any

time. Without management mindfully and intentionally supporting organizational and process restructuring, action will not take place. To begin the design of business processes, leaders must be mindful of the changing environment, internal control systems, absorptive capacity and organizational agility. Mindfulness plays a critical role in improving innovative performance through the recognition of organizational situations that demand an innovative response and the execution of the actual response (Swanson & Ramiller, 2004). Regardless of the recent attention from researchers, the links between mindfulness and performance have scarcely been studied (King & Haar, 2017). Even still today, organizations need to address the factors that may have hindered and/or is still hampering their business process performance prior to the next phenomena. This brings me to my research question.

Research Question

"What are the factors that affect business process performance for US enterprises during disruption?"

Research Objectives

This study aims to investigate how business process performance will be affected by internal controls, organizational agility, business process modularity, top management mindfulness, and knowledge absorptive capacity constructs respectively. Additionally, the paper's objectives are:

- To offer additional factors for organizations to consider when evaluating business process performance efficiency and effectiveness and their importance for continuous operations.

- To disclose how an internal controls framework can impact business process performance.
- To kickstart internal conversation between leaders and amongst departments and teams about the innerworkings of their functional areas, roles and responsibilities for process support, and important factors that may need to be addressed to maintain or increase business process performance.
- To initiate an understanding of organizational processes based on procedures, policies, laws etc. for strategic process initiatives for identification, design, and improvement.
- Determine resources who are a part of processes, their contribution, authority, and roles from strategy planning to execution and support.

This research paper is structured as follows with the research question, objectives and contributions completing this chapter. The next chapter has a discussion of theoretical frameworks and provides a review of literature to support the aforementioned constructs and their relationship to business process performance. In addition, chapter three of the study allows me to introduce the methodology, hypotheses, model, research design, informed pilot, and field study pilot. The final two chapter will house the main field study for this research followed immediately with discussion and implications, limitations, and conclusion. Lastly, the subsequent sections present references, and appendices and vita.

Research Contribution

It is my intent to offer practitioners and academics clear factors that affect business process performance based on literature and empirical evidence. It is my goal to

provide organizational leaders, departments, and functional teams a way to discuss process stability, modularity, functional agility, internal control mechanisms, absorptive capacity, and preparedness for disruption as an opportunity to head off business process performance interruption. Ultimately, at the end of this study, my goal is to contribute a starting point for organizations to develop an effective business process lifecycle that includes strategic planning for process discovery, defining, and documentation that leads to establishing solid business process performance measures for their critical processes.

CHAPTER 2: LITERATURE REVIEW AND THEORY

Business Process Orientation (BPO) Framework

Processes are the core of organizations (Willaert et al., 2007). Business Process Management (BPM) argues organizations can gain competitive advantage by improving and innovating their processes through a holistic process-oriented view (Willaert et al., 2007). Business Process Orientation (BPO) of an organization is the level at which an organization pays attention to its relevant (core) processes (end-to-end view across the borders of departments, organizations, countries, etc.) (Willaert et al., 2007). Additionally, organizational focus on relevant processes end-to-end incorporates the design of process performance measures. The process-oriented view begins at the top of the company with management (chief executive officer, presidents, executive vice presidents, etc.) leading the way. It is the top management's responsibility to direct the organization towards process orientation (Willaert et al., 2007). Process-orientation examines internal organization processes as well as processes outside of organizational boundaries that support different external entities like regulatory bodies, partner organizations, suppliers, etc. Leaders must drive their workforce toward understanding

the business and who it serves to be able to adapt its internal processes to support downstream of the process. When process stakeholders understand expectations, they will seek process improvements in advance to help the business stay ahead of the competition. Business process orientation means supporting a cross-functional view of the organization; however, it can look within and beyond other departments. Through conversation and collaboration, senior management has an opportunity to expand the internal knowledge of the workforce by demonstrating how stakeholders can recognize the value of new, external information, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990). Principals mindfully strengthening the absorptive capacity of the company so that everyone has a clear view and understanding of the companies objectives, priorities, and processes are important for process orientation, improvement, and management. Dialogue builds relationships amongst stakeholders and aids knowledge absorption and adaptation to organizational processes.

Through collaboration, top management can facilitate strategic initiatives for the implementation of a process-oriented structure that enforces process identification, process definitions, process design and measurement and when reevaluated, process improvements. It is critical that processes are well identified, defined and mapped in order to select and improve the right process (Willaert et al., 2007). The innovative process initiatives directed by leaders needs documentation for configuration, testing, posterity, lessons-learned, and analysis. According to Willaert et al. (2007), a process-oriented view requires the presence of sufficient process documentation and process modelling or visualization. Process documentation and visualizations can provide new knowledge and alternative views of complex processes, participant roles, key

performance indicators and people management. Process-oriented initiatives lead to aligned process performance measures and accountability for process outcome.

Process-oriented organizations break through vertical silos and departmental boundaries by integrating multidisciplinary or cross-functional horizontal matrixed teams with a process owner to oversee and take responsibility for process outcome and performance. The cross-functional teams could become a business process center of excellence or business process office who has the skills and knowledge to establish hierarchical structures, process architectures, set performance criteria, monitors process performance, addresses process performance issues, and manages process improvement initiatives. Process owners are responsible for processes whether it is a high-level parent process or subprocess of a high-level process. Processes needs to be continuously analyzed, measured, and managed by process managers for improvement. Key performance indicators (KPI) also known as metrics or measures must be defined and implemented to allow executives (process owners) to monitor processes. KPIs does not always align to processes because they are born out of the company's strategy and cascaded down vertically and horizontally only to be translated into department objectives for the KPIs they support. Process performance measurement can be a vital tool for strategy execution by signaling what is really important, providing ways to measure what is important, fixing accountability for behaviour and results, and helping to improve performance (Javadian (2020); (Willaert et al. 2007).

Process-oriented companies have a change supportive environment and buy-in from employees who are accountable for their roles, participates in workflows, and promotes and accepts performance improvements efforts. In a process-oriented

organization, people will be identified, evaluated and rewarded based on their competences in understanding and improving processes (Willaert et al., 2007). Process performance relies on the roles and responsibilities of 'human' resources owning and conducting process activities efficiently and effectively. Indicative measures for process performance effectiveness and efficiency cannot be established without leadership's clear understanding and formal/informal strategic discussions with resulting consensus on (1) company objectives; (2) the laws, policies, and procedures that processes stand on; (3) critical process identification and definitions; (4) intellectual capital (process owners and stakeholders knowledge); (5) scalability and agility of organizations; and (6) the orientation and modularization of processes. The formal conversations can be very lucrative professionally and relationally setting the scene to break the silos that organizations seem to work within.

Resource-based View Theory

Business process performance cannot be established nor measures created without company resources, human and organization capital. Company resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a company that enable the business to conceive of and implement strategies that improve its efficiency and effectiveness (Daft, 1983; Barney, 1991). The event of determining a strategy can be a process of informal or formal strategic planning. To the extent that these processes suggest valuable strategies for the company, processes can be thought of as company resources (Barney, J. 1991). Business processes and its performance is one of the best leadership tools and visual displays of organizational objectives and strategies at work and organizational resources of competitive advantage

as well as significant measures of internal efficiency and effectiveness. In the language of traditional strategic analysis, company resources are strengths that companies can use to conceive of and implement their strategies (Learned, Christensen, Andres, & Guth, 1969; Porter, 1981)

In order to implement streamlined processes using value-creating strategies, organizations must have the right human capital resources who have insights on policies, procedures, laws, etc. at the executive and manager level and include those individual contributors who execute those processes and implement strategic organizational objectives. Human capital resources include training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm. (Barney, 1991) Critical business process identification, definition, design, configuration, testing, deployment, execution, management, reporting and assessing of metrics on BP performance relies heavily on an organization's human resource knowledge. Establishing business processes and its performance indicators needs human resources' understanding of structure, strategic planning capability, and their ability to build, align, and strengthen relationships within the organization. For discovery and dialogue about processes and performance to ensue, there has to be collaboration between leaders and their teams. This is a top-down approach but BP performance strategy cannot survive without bottom-up support. Business processes and its performance measures will not have effective and efficient engineering and indicator formation without human and organizational capital resources. Organizational capital resources include a firm's formal reporting structure, its formal and informal planning, controlling, and coordinating systems, as well as informal

relations among groups within an organization and between an organization and those in its environment. (Barney, 1991)

Business Process Management

Equally important for measuring an organization's performance is business process management (BPM), which is about managing entire chains of events, activities and decisions that ultimately add value to the organization and its customers (Van Looy & Shafagatova, 2016). Business process management is dedicated to analyzing, designing, implementing, and continuously improving organizational processes (Brocke & Rosemann, 2015). For companies to establish true process measurement, they must increase their understanding of who they are and how they operate so a process management life cycle or process strategic initiative to determine processes has to commence. The company business process lifecycle is part of an important decision-making tool in most companies in the developed world (Price and Sun 2017).

BPM has evolved into a comprehensive management discipline focusing on organizational processes at the center of interest (Rosemann, Vom Brocke 2010). Research has shown that in order to successfully implement BPM in an organization it is necessary to incorporate capabilities like strategic alignment, methods, people, and culture (Brocke & Rosemann, 2015).

- **Strategic Alignment:** BPM needs to contribute to superordinate, strategic goals of the organization. Related capabilities include process improvement planning, strategy and process capability linkage, enterprise process architecture, process measures, process customers and stakeholders, the assessment of both processes

and process management initiatives according to their fit with the overall corporate strategy (Brocke & Rosemann, 2015).

- **Methods:** BPM needs to be supported by methods for process design, analysis, implementation, execution, and monitoring. Related capabilities include process design and modeling, process implementation and execution, process monitoring and control, process improvement and innovation, process program and project management, as well as adapting and combining them according to the specific requirements of the organization (Brocke & Rosemann, 2015).
- **People:** BPM needs to consider the employees' qualifications in the discipline of business process management as well as expertise with relevant business processes. Related capabilities include process skills & expertise, process management knowledge, process education, process collaboration and process management leaders as well as programs facilitating the development of process related skills throughout the organization (Brocke & Rosemann, 2015).
- **Culture**: BPM needs a common value system supportive of process improvement and innovation. Related capabilities include responsiveness to change (organizational agility), process values and beliefs (process-oriented thinking), process attitudes & behaviors, leadership attention to process, and process management social networks as well as the ability to derive measures to further develop these values accordingly (Brocke & Rosemann, 2015).

In the past and still today, business process management is perceived as a permanent responsibility providing capabilities needed in order to sustain competitiveness and performance in organizations (e. g. Harmon 2007, Spanyi 2008).

Business Continuity Theory

The theoretical framework of this study is based on the business continuity management (BCM) theory. Business Continuity emerged in response to the increased corporate realization that any disruption in the continuity of the business for an extended period of time will seriously affect the overall practicality of an organization (Foster & Dye 2005). Thus, business processes cannot cease nor sit idle during a crisis without seriously affecting the organization and its business process performance.

Business continuity management (BCM) is a framework that helps organizations prepare for and respond to disruptions or unexpected events that can impact their ability to conduct business as usual. BCM theory provides a framework for organizations to identify and assess risks to their critical business processes, business process performance, and develop strategies and plans to maintain or restore these processes in the event of a disruption (*Government Sector | Resilience Guard GmbH*, n.d.). Risks to critical processes will inherently effect business process performance. BCM theory principles can serve as a framework to conduct the organization's business process performance strategic conversations. The BCM theory is based on the following principles:

1. **Business impact analysis:** Identify critical business processes and assess the potential impact of disruptions to these processes. This analysis helps organizations prioritize their response efforts and allocate resources accordingly.
2. **Risk assessment:** Identify and evaluate potential risks that could disrupt these processes and inherently their performance. This includes natural disasters, cyber-attacks, power outages, and other threats.

3. **Business continuity strategy development:** Develop a strategy that outlines the steps to be taken to maintain or quickly restore critical business processes in the event of a disruption.
4. **Plan development and testing:** Document and test regularly various scenarios to identify any gaps or weaknesses in process flows to ensure that the strategy is effective and up to date.
5. **Training and awareness:** Employees should be trained and made aware of the business process plan, including their roles and responsibilities in executing the plan.
6. **Continuous improvement:** Continuous monitoring and improvement to ensure that the business process plan remains effective in the face of changing threats and business environments.

Organizations can consider enhancing their resilience and impact reduction of unexpected events on their operations when evaluating BCM process.

Internal Controls (IC) Framework

In the United States (US) there are three sectors of the economy private, public, and non-profit. US publicly traded companies are bound by the 'Sarbanes-Oxley" (SOX) Act a law addressing internal controls. The significance of upholding effective internal control system (ICS) in organizations have been persistently and immensely emphasized, due to its positive effects on financial performance (Eniola & Akinselure, (2016); Ibrahim, S., Diibuzie, G., & Abubakari, M. (2017). Organizations must adhere to SOX to be in compliance with government regulations as well as have a way to show evidence of its internal control system (ICSs) at any point in time. According to Tetteh et al. (2022),

ICS refers to all the policies and procedures adopted by the directors and management of an entity to assist them in achieving their objectives of ensuring, as far as practicable, the orderly and efficient conduct of a business, including adherence to internal policies, the safeguarding of assets, the prevention and detection of fraud and error, the accuracy and completeness of the accounting records, and the timely preparation of reliable financial information (Wamukota, M. et al. (2022); Kotey & Ashelby, 2002; Mwindi, 2008; Committee of Sponsoring Organizations of the Treadway Commission, 1992).

A number of empirical studies have been carried out in determining the impact of internal controls on performance variables. Tetteh et al., (2022), Muraleetharan (2010), and Amony (2016) in determining the impact of internal control on financial performance found a very significant relationship. Eko and Hariyanto (2011) found out that internal control system, internal audit, as well as organization commitment have positive significant relationship with good governance. Nilniyom and Chanthinok (2011) found that internal control effectiveness has a positive correlation with stakeholder acceptance. Feng, Li, and McVay (2009) also carried out a study on internal control and management guidance and concluded that internal control quality has an economically significant effect on the accuracy of management guidance (Tetteh et al., 2022).

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) (1992) defines internal controls as a process designed to provide reasonable assurance regarding the achievement of objectives in effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations (Kurniawati, 2011). In order to avoid penalties for lack of SOX compliance, businesses incorporated internal controls into its infrastructure more specifically, their

business processes structure. The realization and effectiveness of the internal controls involves different areas of company structure: Management, internal auditing consultants and compliance experts, external regulation bodies, business process experts (including system developers and technical consultants) and employees (Namiri, 2008).

COSO92 and COSO13 designed a framework to assess internal controls (Tetteh et al., 2022; Eniola & Akinselure, 2016; Sahabi et al., 2017). COSO believes that this framework must be intermingled with an organizations infrastructure. Additionally, COSO has five components of internal control with 17 measures (see Appendix B survey instrument) to determine if organizations have a solid perception of their infrastructure and how they line up when considering how their internal controls meet their business objectives for efficiency and effectiveness. In this case, the objective is to identify and define business processes in their quest to establish efficient and effective process performance.

1. **Control Environment:** COSO (2013) defines control environment as a set of policies and procedures that must be followed in the implementation of internal controls within an institution. The control environment refers to the overall tone set by an organization's top management and the importance placed on internal control. Control environment is established and recognizable through leadership. According to COSO 2013, management will demonstrate commitment to integrity and ethical values; exercise oversight responsibilities; establish structure, authority, and responsibility; demonstrate commitment to competence; and enforce accountability. The control environment begins with directors and management who implement organizational policies, behaviors, and effective governance (Bruwer, Coetzee, & Meiring, 2018; Koutoupis & Pappa, 2018).

2. **Risk Assessment:** Organizations must assess the risks they face and determine how best to manage those risks through the implementation of appropriate controls. Internal control as such becomes an instrument and means of risk control, which helps the enterprise to achieve its goals and to perform its tasks. Identification, assessment, and supervision are embodiment of the risk assessment element of internal control (Tetteh et al., 2022). Proper process design including maintenance, management and process audits are important elements of internal controls. This ensures that organizations do not have the same worker initiating and approving their own workflows exposing the business to unnecessary and avoidable legal risk.

3. **Control Activities:** Control activities are the policies and procedures that organizations implement to mitigate risks and achieve their objectives. Visser and Erasmus (2002) posit that an ICS contains certain control activities, including policies and procedures with regard to approval, authorization, verification, reconciliation, review of operational activities, safeguarding of assets, and segregation of duties. Control activities are the actions defined by the policies and procedures to help ensure that management guidelines are followed to minimize risks for achieving goals (Tetteh et al., 2022). Control activities ensures leadership mandates and objectives are carried out. According to Tetteh et al. (2022), control activities basically comprise; performance reviews (comparing actual performance with budgets, forecasts, and prior period performance), information processing (necessary to check accuracy, completeness, and authorization of transactions), physical controls (necessary to provide security over both records and other assets), and segregation of duties (where no one person should handle all aspects of

a transaction from the beginning to the end).

4. **Information and Communication:** Information and communication systems must be in place to ensure that employees have the necessary information to carry out their responsibilities, generate compliance and operational reports to help manage processes and business activities, and guarantee that communication flows effectively throughout the organization. Furthermore, information can be used to analyze process performance metrics, financial performance, monitor performance, allocate resources, and decision-making. Communication is defined as "the continual, iterative process of providing, sharing and obtaining necessary information (Committee of Sponsoring Organizations of the Treadway Commission (COSO), 2014:105). The communication aspect of this component deals with providing an understanding of individual roles and responsibilities pertaining to internal controls. People should understand how their activities relate to the work of others and how exceptions should be reported to higher levels of management.

5. **Monitoring:** Internal control systems must be monitored to ensure they are operating effectively and to identify and address any weaknesses or deficiencies. Regular monitoring is imminent due to changing conditions, hence management seek to determine if current internal control mechanisms continue to be relevant and can address new risks (Adegboyegun, Ben-Caleb, Ademola, Oladutire, & Sodeinde, 2020; Wali & Masmoudi, 2020). Monitoring is the evaluation of an organizations events and transactions to gauge the quality of performance throughout the period and to decide whether controls are effective (Dowdell, Klamm, & Andersen, 2020; Gamage, Lock, & Fernando, 2014).

Deriving an IC strategy for identifying specific processes that support efficiency and effectiveness are critical for SOX compliance, reporting out to other external regulatory agencies, and competitive advantage. Management's grasp of internal controls, how to uphold laws, and embed checks and balances of operational activities into their fabric is paramount for compliance and proper process performance metrics creation. At the end of the day, to establish and analyze process performance, leaders must lead efforts by holding strategic planning conversations to answer an overabundance of questions around the resources needed for operational continuity through disruption; the stakeholders supporting critical activities and processes; the orientation of tasks that need to be executed and completed by cross-functional teams; and processes that originate from a regulating body, internal policy or procedure or mere practices, etc. Organization requires having in place the systems and practices that allow human resource characteristics to bear the fruit of their potential (Barney & Wright, 1998).

In this thesis, we focus on the relationship between internal controls for process effectiveness and efficiency and the business process lifecycle. As it relates to internal controls and business process performance, the relationship can be described as follows:

- **Process Planning:** Strategic planning that incorporates all significant transactions, accounts, laws, policies, procedures, etc. externally and internally for major functional areas or departments (i.e. finance, sales and marketing, human resources, purchasing, legal, information technology, and C-suite executive) that aligns to company objectives and supports operations.
- **Process Identification:** Identify critical business processes that affect those transactions, accounts, laws, policies, procedures, etc.

- **Process Definition:** Define new processes or redefine current processes documenting process control objectives. Performance measurement involves defining the concept, selecting components and deciding on how to measure them (Willaert et al., 2007).
- **Process Design:** Design process workflows based on laws, policies, procedures, etc. making certain to include who is a part, what roles are a part, and the vertical or horizontal departments that are a part of process flows as well as, who initiates, who reviews, who approves, etc. workflows that were established and set by managers. The process designs can be instituted at the company level or specific to a department.
- **Process Risk Controls:** Establish controls for risk detection, risk mitigation and continuous risk assessment criteria for each relevant business process.
- **Process Performance Metrics:** Set performance measures for each business process's completion.
- **Process Configuration:** building workflows based on design requirements
- **Process Test**: The business process design and configuration must be tested and proven to meet process performance measures and preestablished requirements that should support a policy, procedure, or law like SOX's internal controls.
- **Performance Analysis**: Ultimately, once deployed the process metrics will be used for statistical analysis and reporting out to leaders and regulators.

CHAPTER 3: METHODOLOGY

3.1 Conceptual Model & Hypothesis

The conceptual framework (Figure 1) pinpoints factors that contribute to the foundation of business process performance at the organizational level. Business process performance is the dependent variable being measured by five independent variables that will impact its proper preliminary measurement design (1) internal controls, (2) top management mindfulness, (3) organizational agility, (4) business process modularity, and (5) knowledge absorptive capacity. There are six variables being controlled for that impacts both dependent and independent variables which includes company age, company US location, business process involvement (life cycle participation), functional department, functional department tenure, and employee level.

Figure 1: Conceptual Model & Hypothesis

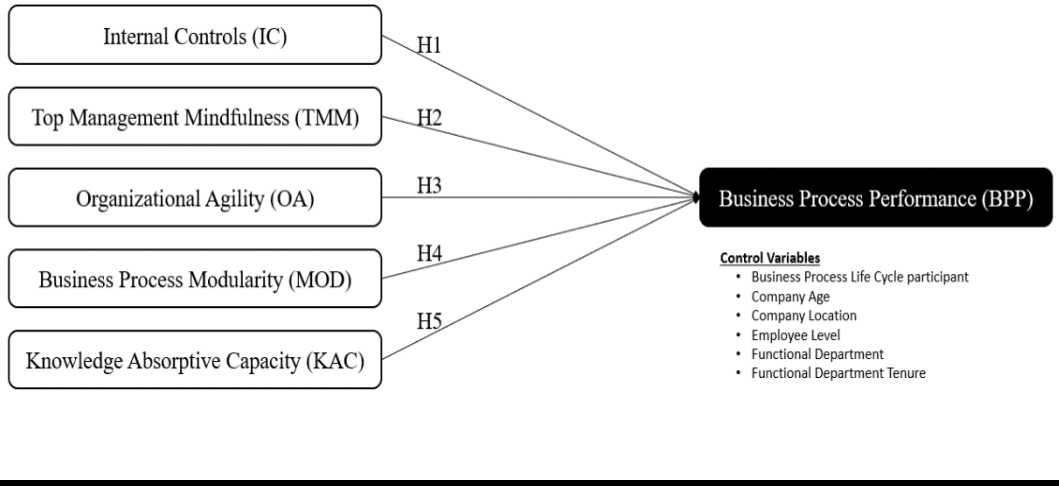


Figure 1 The Conceptual Research Model

3.1.1 Internal Controls (IC)

In the public, private and non-profit sectors, the market is constantly changing, and this requires changing the attitude towards internal controls from only increasing financial performance to examining its effect on process performance. Many companies no longer develop an internal control structure as a regulatory requirement, as it helps to ensure that all administrative operations are carried out properly (Abiodun, 2020). Companies incorporate an internal control system to uncover, define, assess risk, communicate, monitor, and report out on processes to management, regulatory institutions, and stakeholders which can be beneficial in a changing our dynamic environments. Various problematic situations can be caused by changes in an organization and its environment and can lead to non-compliance with organizational goals and expectations of users and/or stakeholders, as well as with the requirements of standards or legal obligations (Vasović et al., 2022). Stakeholders are the driving force in the business process ethos (i.e., lifecycle, orientation, management, performance analysis and so on) and championing internal control system adoption. Ibrahim et al. (2017) and Nilniyom and Chanthinok (2011) found that internal control effectiveness has a positive correlation with stakeholder acceptance. A stakeholder approach can help managers analyzing how the company fits into their larger environment, how its standard operating procedures affect stakeholders (employees, management, shareholders) in the company and immediately beyond the company (customers, suppliers, financiers) from an analytical standpoint (Abiodun, 2020). It is also a general belief that properly instituted systems of internal control improve the reporting process and also give rise to reliable

reports which enhances the accountability function of management of an entity (Kaplan, 2008).

With an internal controls infrastructure, companies can identify processes where improvements can have the greatest effect and increase process performance, meet compliance, enhance services, improve financials, and other productivities. Businesses with internal controls in place understand their workers roles and responsibilities within value-add workflows or processes and where there might be deficiencies. It is understood that an organization can do more with its current resources by boosting the effectiveness and efficiency of its way of working (i.e., its business processes) (Sullivan 2001). Internal controls allow for exposure of limitations in the human resource and process pipeline. Boudreau and Ramstad (2002, 2003) have used the metaphor of limitations in a pipeline, to help organizations locate and define key process points. Due to possible limitations, we must identify and analyze key processes along with analyzing functional area accountability and roles involved in business process transactions and process management. In process analysis, it is important to balance what people say they do (espoused behaviour) against what they actually do (observed behaviour) (McNulty and Ferlie, 2004). As it relates to process performance, organizations must understand the skills required to conduct effectiveness evaluations and relevance using the guidance provided by regulatory bodies such as the Committee of the Sponsoring Organizations of the Treadway Commission (COSO) (1992 & 2013) Internal Control Framework (Hayes, 2013).

Good internal control of company quality includes a frequent examination of the accuracy and credibility of financial and administrative records, a review of the measures

used (in this case processes), an evaluation of employee adherence with management practices, protocols and related laws and regulations, and an assessment of the efficiency and efficacy of leadership (Abiodun, 2020). COSO's internal controls framework (1992/2013) will assist in determining what constitutes "key controls" and identification of the appropriate amount of related documentation and testing to conclude on the effectiveness of internal controls, determination of "material weaknesses" and related remediation plans, and other contentious areas of regulations. According to Walsh & Seward (1990) and Chung, Chong, & Jung (1997), internal control involves the supreme enterprise control apparatus and enterprise shareholders (Lakis & Giriunas, 2012). It is also a general belief that properly instituted systems of internal control improve the reporting process and also give rise to reliable reports which enhances the accountability function of management of an entity (Kaplan, 2008). This study is examining whether internal controls lead to an increase in business process performance. Only an effective ICS in the enterprise is able to help objectively assess the potential development and tendencies of enterprise performance (Lakis & Giriunas, 2012). With this in mind I posit the following hypothesis.

H1: As internal controls increase, business process performance will increase.

3.1.2 Top Management Mindfulness (TMM)

Mindfulness pertains to the cognitive abilities of an individual (Langer & Moldoveanu, 2000). It has been perceived as a state of mind (Brown & Ryan, 2003; Langer, 1989), as a trait (Sternberg, 2000), as a cognitive skill, and, last but not least, as a cognitive style (Sternberg, 2000; Bhatti et al., 2021). Because of past global crises and a lingering pandemic, top management teams (executives and senior management) had to

be mindful of factors that could impact performance (process, financial, market, resource, etc.) and how they will maintain performance steadiness. Management's strategic, process-oriented leadership is required when taking on innovative process initiatives such as establishing process performance indicators. According to Langer, (1989) and Sternberg (2000), a mindful person is a person who is open to innovation and vigilant but at the same time thoughtful and alert to his/her surroundings.

The skills of the work force are all common across firms but highly skilled individual managers or top management teams are more rare (Wright et al., 1994). According to the upper echelons' theory, the cognitive structure of an organization's top management team determines the organizational outcomes (Christofi, Vrontis, Thrassou, & Shan1s, 2019). Businesses who are led by principals who naturally adjusts to uncertainty, can mindfully carry their organization through challenging predicaments where business performance is not or hardly affected. Good leaders mindfully recognize situations that demand an innovative response and the execution of the actual response (Swanson & Ramiller, 2004). Principals manage the company for its stakeholders to ensure their rights and participation in decision-making. Leaders facilitate talks with stakeholders at different levels whom they supervise to push the organization towards a process-oriented frame of mind. Stimulating interdepartmental and proactive behaviour is key to introducing process orientation (Willaert et al., 2007). Thus, process-oriented management will gain buy-in and support for implementing new or revised performance measures when process performance meetings are led and directed by them. Top management's active management of the environment and gravitation toward innovation in certain and uncertain times is how management should lead. According to Langer &

Moldoveanu, (2000), such a mindful person responds to changes in his/her environment and creates new or improved processes. Afterall, it is managers that are able to understand and describe the efficient performance potential of a company's capabilities (Barney, 1991). In light of the above argumentation, we propose that mindfulness has a positive relationship with business performance.

H2: As top management mindfulness increases, business process performance will increase.

3.1.3 Organizational Agility (OA)

According to Campanelli and Parreiras (2015), agility includes flexibility, learning, and responding efficiently and quickly to changes in the environment. Changes in the environment or disruptions tend to unveil areas of opportunity for organizations amongst their workforce whether its low quality of work, lack of agility that creates a lapse in process performance, or knowledge gaps. Agile organizations must strive to create an equilibrium between the apparently conflicting processes of stability and flexibility to survive and grow in response to environmental uncertainty because flexibility without stability can result in chaos (Lu & Ramanmrthy, 2011; Volberda, 1996). The effect of such flexibility would increase the likelihood that processes and procedures will perform as expected and the hazard will be retained at tolerable levels (Abiodun, 2020). The organizational perspective focuses on the core processes and critical processes of the company (Tinnila, M. (1995). Nonconformities lead to numerous negative consequences in the functioning of an organization (Vasovic et al., (2022).

The capacity of an organization to keep its human resources aligned with business needs by transitioning quickly and easily from one HR formation to another and another,

ad infinitum' (again and again in the same way; forever) is organizational agility. (Dyer & Ericksen, 2005) Agile organizations have a scalable workforce that will be able to sustain performance criterion during normal operations or disruption. The "value-based" theory of the organization suggests that sustainable competitive advantage is created through resources that are valuable, rare, difficult to imitate, and supported by organizational structures that allow them to be exploited effectively (Barney & Wright, 1997). The organization's scalability capability could be a performance measure for agile organizations. Workers can be shifted dynamically to where they are needed when they are needed. Hence, cross-trained workers should be able to achieve a higher performance (or the same performance with a smaller workforce) than specialized workers. Businesses who are not able to use their knowledge and organizational resources to respond effectively to environmental changes lacks organizational agility. Due to the changing nature of organizational environmental factors, organizational agility is essential for organizations (Shams, Vrontis, Belyaeva, Ferraris, & Czinkota, 2020). Organizations need to assess their agility periodically even in good times. When organizations lack agility it will not be able to adapt their activities and processes in response to fluctuations in their surroundings (Cegarra-Navarro, Soto-Acosta, & Wensley, 2016). Business must understand how the environment and catastrophes impact its ability to execute business processes to maintain compliance, meet organization goals, and expectations of users and/or stakeholders. Agility must have a performance measure to validate that the organization can adjust to crises.

Since agility is associated with superior organizational performance, an agile organization can survive and even prosper in the face of complexities (Rialti, Zollo,

Ferraris, & Alon, 2019). The literature has found evidence of an impact of organizational agility on firm performance (Tallon & Pinsonneault, 2011). Organizational agility can enable organizations to manage their knowledge resources while responding effectively to a wide variety of organizational and environmental changes (Bhatti et al., 2021). We aim to study the impact of organizational agility on business process performance and advance the following hypothesis.

H3: As organizational agility increases, business process performance will increase.

3.1.4 Business Process Modularity (MOD)

Modularity was initially used to control variety and increase interchangeability in a turbulent environment (Starr, 1965). Organizations has to be able to identify processes and define the actions and steps and all sub processes involved. The challenge of coordination and transaction challenges according to the Modular systems theory, can be partially addressed through the use of modular organization design such as loose coupling among processes, information hiding (or encapsulation) within processes, and compliance with standardized interface and performance specifications (Baldwin and Clark 2006; Langlois 2006). Process modularity is the extent to which the production process is separated into standardized modules that can be easily re-sequenced into new processes that fulfill the requirements of producing new product features (Feitzinger and Lee, 1997). As workers identify critical processes and record the ordering of actions, they have the ability to reorder into new process flows or sub processes. The return on process transformation, for instance, is a financial measure that can be used in order to evaluate alternative process designs based on their return on investment (Vom Brocke et

al. 2009). Business and IT managers can add value to their firms by developing an enterprise architecture that contains well-defined modules and interfaces among business processes and between business processes and IT (Tanriverdi et al., 2007).

BP performance measures can be thought through and how the application of those measures is to apply for each process. Modular organization design enables participating firm to maintain the integrity and autonomy of their internal operations while coordinating process interdependencies (Hagel and Brown 2005). Research shows that firms and functional units within firms are at different levels of maturity in terms of their modular design capabilities (Ross et al. 2006). Therefore, a collaboration of the different experience levels will help to devise a solid strategy for realizing factors that impact performance measures.

H4: As business process modularity increases, business process performance will increase.

3.1.5 Knowledge Absorptive Capacity (KAC)

Knowledge absorptive capacity (KAC) has been recognized as a key factor of different kinds of innovation like process, product, and marketing (Santoro, Quaglia, Pellicelli, & De Bernardi, 2020). Business process identification relies on stakeholder's past and present organizational and functional knowledge of traditions, laws, policies, procedures, etc. The knowledge of a firm's policies and procedures provide value to that firm but usually would not be valuable to other firms (Barney & Wright, 1998). In the process of knowledge reuse, new knowledge may be created through knowledge combination (Nonaka, 1994). Workers with specific knowledge and skillsets for business process engineering, reengineering, or optimization could provide value if those

processes' logic, configurations, and measures are hard to imitate for a particular business in a particular industry. One can accomplish firm-specific skills through investing in constant training and development of employees to perform work on processes and procedures that are specific to the company (Barney & Wright, 1998). Departments with specific processes can increase its process performance by investing in their worker's knowledge through Education. Knowledge from different departments also needs to be interpreted, combined, or shared by the whole organization (Slater and Narver, 1995). Gathering workers who are a part of a business process in any capacity within the organization has much to contribute to business process outlining and performance criteria. The core tenet of organizational learning theory is to develop skills and capabilities through both intra-organizational and inter-organizational learning (Ignatius et al., 2012, Lin et al., 2012). Organizational learning is "the development of insights, knowledge and association between past actions, the effectiveness of those actions, and future actions" (Sisson, P., & Ryan, J. (2016); Fiol and Lyles, 1985). The literature on organizational knowledge creation points out that "coordination" plays an important role in combining knowledge (Nonaka, 1994).

Cohen and Levinthal (1990) defined organizational absorptive capacity as the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends. It is also an important process necessary for organizations to identify opportunities and use new knowledge to realize innovation such as new processes or process performance measurement instruments. Executives, managers, and individual contributors are the correct participants during process discovery and performance metrics establishment because of their past and present knowledge.

Organizational learning is "the development of insights, knowledge and association between past actions, the effectiveness of those actions, and future actions" (Fiol and Lyles, 1985). By reusing the knowledge from past orders, this tacit knowledge is transformed into explicit ideas (Zhiqiang Wang, et. al. (2014). Such a transformation is called "externalization" (Nonaka, 1994). Apart from data that is internally generated and utilized, information concerning external events, activities, and conditions are essential to informing business decision-making (Burke, Polimeni, & Basile, 2020; Frazer, 2020; Sawyer, Dittenhofer, & Scheiner, 2003), specifically business process decisions. Successful knowledge transformation speeds up the assimilation of new knowledge and results in better innovation performance as well as superior firm performance (Xie et al., 2018). Since many researchers have concluded that knowledge absorptive capacity is significantly related to performance outcomes (Bhatti et al. (2021); Ferraris, Santoro, Bresciani, & Carayannis, 2018; Tseng, Chang Pai, & Hung, 2011), we also posit that knowledge absorptive capacity is related to business performance.

H5: As knowledge absorptive capacity increases, business process performance will increase.

3.1.6 Construct's Definitions

A summary of construct definition utilized in this research effort is provided in Table 1.

Table 1: Constructs Definitions

CONSTRUCTS	*REFERENCES*
Business Process Modularity (MOD) - *the extent to which the production process is separated into standardized modules that can be easily re-sequenced into new*	*(Feitzinger and Lee, 1997)*

processes that fulfill the requirements of producing new product features (Feitzinger and Lee, 1997).	
Business Process Performance (BPP) *- Operational efficiency of inter- and intra-organizational processes which can measure the financial and non-financial flexibility, reliability, responsiveness, and costs/assets of organizational and operational capabilities Kim, Gimun, Bongski Shin, and Varun Grover (2010); (Bernhard, Peter, Zoltan, & Maria-Luise (2006).*	*Kim, Gimun, Bongski Shin, and Varun Grover (2010); (Bernhard, Peter, Zoltan, & Maria-Luise (2006)*
Knowledge Absorptive Capacity (KAC) *- the ability of a firm to recognize the value of new, external information, assimilate it, and apply the knowledge for commercial ends Cohen and Levinthal (1989).*	*Cohen and Levinthal (1989)*
Organizational Agility (OA) *- An agile competitive environment is where the capability of a business to develop and utilize its knowledge base to gain a competitive advantage in a complex and volatile digital market according to Van Oosterhout et. al., 2006, which includes flexibility, learning, and responding efficiently and quickly to changes in the environment (Campanelli & Parreiras, 2015) wherein the people skills, knowledge and experience are the main differentiators between the companies (Goldman et. al., 1995).*	*Van Oosterhout, Waarts, & Van Hillegersberg, 2006); (Campanelli & Parreiras, 2015); (Goldman et al.,1995)*
The Committee of Sponsoring Organizations of the Treadway Commission (COSO 1992) Internal Control (IC) *– internal controls is a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following three categories: Effectiveness and efficiency of operations; Reliability of financial reporting; and Compliance with applicable laws and regulations.*	*The Committee of Sponsoring Organizations of the Treadway Commission (COSO 1992 & 2013)*

Top Management Mindfulness (TMM) *– According to Sternberg (2000), leadership being open to innovation and vigilant but at the same time thoughtful and alert to his/her surroundings and evaluating all the factors of how they will maintain business continuity (Langer (1989).*	*Sternberg (2000); Langer (1989)*

3.1.7 Controls

In this study, we controlled for several variables (see table 2). We controlled for company age, company US location, business process lifecycle involvement, functional department, functional department tenure, and employee level. *Functional department tenure* with a minimum of one year as a control variable accounted for time in a department to gain process knowledge and variation of process knowledge. Controlling for *functional departments* that typically have high process usage account for knowledge of the process lifecycle phases process modularity, management, and process performance. Holding *employee levels* constant brings about understanding of roles and responsibilities around processes. Further, we controlled for *company age* of at least 3 years affirmed that businesses would have a solid process foundation internally and within their industry understanding policy, procedures, and laws like GAAP, OSHA, and accountability for internal controls mechanisms and SOX reporting. The *company location* control allowed concentration on a targeted country and understanding of laws, regulations and processes. Lastly, we controlled for *business process lifecycle* involvement that accounted for experience with phases of business process deployment and the lifecycle participation duties, roles and responsibilities, such as strategic

planning, defining, designing, configuration, testing, implementation, and process management.

Table 2: Controls Definitions

CONTROLS	*DEFINITIONS*
Company Location	*Company must be located in the United State*
Company Age	*Company must be in business at least three years*
Functional Department	*Participant must work in one of six functions-departments (i.e. C-Suite Leaders, Human Resources, Finance, Information Technology, Procurement, Sales and Marketing or Legal).*
Functional Department Tenure	*Participant must have at least 1 year of experience in function-department*
Employee Level	*Participant must belong to one of the employee levels (i.e. executive, senior manager, Middle manager, manager, individual contributor) for their role.*
Business Process Lifecycle Participation	*Participant must have experience in one of the BP lifecycle phases…strategy, definition, design, configuration, testing, implementation, or management.*

3.2 RESEARCH DESIGN

This study was an experimental design that included a quantitative survey instrument that was assembled in a software solution called Qualtrics Core XM. The survey was disseminated online for data collection via Connect by Cloud Research (Connect), a commercial website that specializes in survey administration in a cost-effective and efficient manner. Connect was used as well to recruit participants for survey administration. The unit of analysis and observation for this research is at the

organizational level. In relation, data was collected from organizations operating in the United States.

This research endeavor attends to the research question and hypotheses proposed over three phases (1) an informed pilot, (2) statistical field study pilot, and (3) the main field study. The informed pilot was an effective way to establish content and face validity in addition to obtaining additional insight on procedures to perform the research instrument. The field study pilot was used to confirm the approach for the main field study and it was a precursor to assess internal reliability as hypothesized in the research model. Problems identified in the field study pilot results were addressed before conducting the main field study.

3.3 MEASUREMENTS OF VARIABLES & DATA COLLECTION

The following are brief descriptions of the main constructs and control variables. According to A.N. Oppenheim (1992), "Questionnaires do not emerge fully fledged; they have to be created or adapted, fashioned, and developed to maturity after many abortive test flights. The aim of the online survey instrument was to collect data for analysis and testing of the research model and hypotheses. The goal of the survey is derived from literature reviews, an identified need, and based on experiences of experts in the field. (Fink, 2003) The survey was constructed using a seven-point Likert Scale ranging from 1 – 7 where 1 is "strongly disagree", 2 is "agree", 3 is "somewhat agree", 4 is "neither agree nor disagree", 5 is "somewhat disagree", 6 is "disagree", and is 7 is "strongly agree" to measure all constructs. It has been claimed that the ideal number of item alternatives appeared to be centered on seven with some situations calling for as few as five or as many as nine (Cox, 1980) Some literature suggests that a five-point scale

appears to be less confusing and to increase response rate and response quality along with reducing respondents' "frustration level" (Babakus & Mangold, 1992; Devlin, Dong, & Brown, 1993). As for this study, the seven-point scale was used to capture the gray areas of choice between 'agree' and neither agree nor disagree' and 'disagree'. Participants may not fully 'agree' or 'disagree' when a choice is given or their reasoning conflicts with a statement where they can partly agree with a statement as well as have an alternative reaction or opposite view both with a single statement on either side of 'neither agree nor disagree'. Hence, the measures of 'somewhat agree' and 'somewhat disagree'. The scale was used to determine the time it will take to administer the instrument. The completion time for the survey was approximately 30-45 minutes from beginning to end. Each construct being assessed provided a definition of the construct based on literature and research for better understanding of the construct being measured. For the survey item formation, prior research, literature, and regulatory guidance with evidence of internal consistency were reviewed to develop the assessment measures for each construct: business process performance, internal controls, business process modularity, knowledge absorptive capacity, organizational agility, and top management mindfulness) The survey consisted of 59 adopted items in total (excluding five qualifying and 11 demographic questions) to size up all main constructs. The design, the development of the measurement items, and the questionnaire were constructed in line with the guidelines that have commonly been mentioned in prior research (Aydiner et. Al., 2019; Dillman, 2007; Hinkin, 1998).

3.3.1 (Dependent): Business Process Performance (BPP)

Business process performance has many measures. Relying on the existing literature (Bayraktar, Demirbag, Koh, Tatoglu, & Zaim, 2009; Elbashir et al., 2008; Luo et al., 2012; Mahmood & Soon, 1991; Mclaren et al., 2011; Mithas et al., 2011; Aydiner et al., 2019), the dependent variable, business process performance (BPP) was measured by ten items based on a subjective approach of the literature and operationalized using the seven-point Likert scale. The definition provided for understanding is as follows: the term "business process performance" specifically refers to operational efficiency of inter- and intra-organizational processes (Kim, Gimun, Bongski Shin, and Varun Grover (2010). Results from participant responses were such that higher scores for each item symbolized an increase in performance.

3.3.2 (Independent): Internal Controls (IC)

The internal controls construct items was adopted from aspects of the COSO (1992, 2013) framework based on the US government's legal requirements and viewpoints in Sarbanes Oxley Act and (Tetteh et al., 2022) research on performance. The law requires that the US business infrastructure have mechanisms and/or processes in place to support, monitor, measure and report out on the internal control elements of controlled environment, risk assessment, controlled activities, information and communication, and monitoring for regulatory and compliance using vetted and preestablished criteria for those elements. There are 17 items in total measuring the internal controls variable. To level the landscape, and to assist with increased understanding of the internal controls approach and requirements, definitions were provided prior to the items for the area of interest being referenced. The definition for aspects of internal controls are as follows:

- Control Environment - as stated by COSO (1992) an operative "control environment" is an environment where qualified people understand their roles and obligations, limits to their authority and are knowledgeable, mindful, and committed to doing what is right and doing it the right way. They are committed to following an organization's policies and procedures and its ethical and behavioral standards (Agyapong, 2017). They further noted that control environment has an impact on the extent to which individuals recognize what they will be held answerable ((Agyapong, 2017); Whittington & Pany 2009).
- Risk Assessment - as stated by COSO (1992) "risk assessment" is the identification and analysis of relevant risks to achievement of the objectives, forming a basis for determining how the risks should be managed. Mechanisms should be placed to identify and deal with risk since economic, industry, regulatory and operating conditions will continue to change (Agyapong, 2017). In other words, risk assessment is the process of identifying and analyzing risks to achieving a company's goals, analyzing events that may occur, considering the possibility of it happening and the impact on achieving its objectives, and deciding how to react to the risks (Agyapong, 2017); Office of Financial Management, 2015). Managers set goals and objectives at levels that align with the company's mission and vision. (Agyapong, 2017; Office of Financial Management, 2015).
- Control Activities - "Control Activities" are policies and procedures established and executed to ensure that actions identified by management are necessary to mitigate risks (Agyapong, 2017). Control activities are the policies and procedures that help ensure that the management directives are carried properly and in a timely manner.

Necessary actions are taken to manage, reduce and to address risks towards the achievement of the entity's objectives (Agyapong, 2017); COSO, 1992). Additionally, control activities are performed at all levels of the entity, at various stages within business processes, and over the technology environment" (Romney & Steinbart, 2009).

- Information and Communication - the "Information and Communication" area focuses on systems or processes that identify, capture, and exchange information in a form that enables people to carry out their responsibilities and roles (Agyapong, 2017). Information can be identified, captured, and exchanged within the company and with external parties. Information communicated should be timely, accurate and reliable (Agyapong, 2017); COSO, 1992).
- Monitoring - as stated by COSO (1992) "monitoring" of controls is one of the areas of internal control that assess the quality of internal control performance over time. It is necessary to monitor internal control to know whether it is functioning as expected and whether changes are needed. Monitoring can be achieved by ongoing activities such as supervising regularly (Agyapong, 2017); Whittington & Pany, 2009).

Results from participant responses were such that higher scores for each item symbolized an increase in performance.

3.3.3 (Independent): Modularity (MOD)

The business process modularity items included measures with proven internal reliability that were overall derived from Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007). In addition, the measures of this construct are grounded in the modular

systems theory from previous supporting literature (Baldwin and Clark (1997), Malhotra et al. (2005), Sanchez and Mahoney (1996), Schilling (2000), Simon (1962) and the literatures on product/process life cycle and maturity (Anderson and Zeithaml, 1984; Benner, 2002; CMMI, 2002; Harter et al., 2000). There were 10 items measuring modularity. The thought given for the term 'modularity' in support of understanding for ease of operationalization was that "modularity" specifically refers to the practice of standardizing business sub-processes so that they can be re-sequenced easily or new modules can be added quickly in response to changing requirements (Thatte, 2013); Feitzinger and Lee, 1997). Results from participant responses were such that higher scores for each item symbolized an increase in performance.

3.3.4 (Independents): Knowledge Absorptive Capacity (KAC), Organizational Agility (OA), & Top Management Mindfulness (TMM)

The items for "knowledge absorptive capacity" (KAC) were drawn from the previous work by Bhatti et al., (2021), Flatten, Engelen, Zahra, and Brettel (2011), Xie et al. (2018), and Zahra and George (2002). The notion for the term "knowledge absorptive capacity" specifically refers to the ability of a firm to recognize the value of new, external information, assimilate it, and apply the knowledge for commercial ends (Redd, V., & Dyaram, L. 2014; Cohen and Levinthal, 1989). The 13 items for the construct were measured on the seven-point Likert scale mentioned above. Results from participant responses were such that higher scores for each item symbolized an increase in performance.

The items for "organizational agility" (OA) were adopted from Bhatti et al., (2021) and Cegarra-Navarro et al. (2016), which were adapted from Lu and

Ramamurthy's (2011) study. The idea provided for 'organizational agility was that the term "organizational agility" specifically refers to the capability of a business to develop and utilize its knowledge base to gain a competitive advantage in a complex and volatile digital market including flexibility, learning, and responding efficiently and quickly to changes in the environment (Van Oosterhout, Waarts, & Van Hillegersberg, 2006). Further, agile organizations must strive to create an equilibrium between the apparently conflicting processes of stability and flexibility to survive and grow in response to the technological changes and environmental uncertainty because flexibility without stability can result in chaos. The six items for the OA variable were assessed using the seven-point Likert scale. Results from participant responses were such that higher scores for each item symbolized an increase in performance.

"Top management mindfulness" (TMM) was measured towards transformation using a three-item construct. The term "top management mindfulness" specifically refers to a person who is open to innovation and vigilant but at the same time thoughtful and alert to his/her surroundings (Sternberg (2000). The six items for the variable were adopted from (Bhatti et al., 2021) and Li et al. (2019) and assessed using the seven-point Likert scale previously mentioned. Results from participant responses were such that higher scores for each item symbolized an increase in performance.

3.3.5 (Controls): BP life-cycle participation, Company location, Company age, Function/Department, Function/Department Tenure & Employee Level

To rule out major alternative explanations for our finding, we review the sourcing literature and control for factors that are shown to have bearings on the sourcing choice (Tanriverdi et al., 2007). Company location was based on the country where the company

conducted business. This study required companies to be in the United States. Company age was measured by a minimum number of years (no less than 3) since the establishment of the firm. In fact, from day one, all US companies will execute or have common processes in place to conduct daily operations whether manual or automated. However, by year three, they will be minimally aware of how those processes are executed, stakeholders affected, why they were put in place, etc. Prior research found that company specificity of knowledge impacts sourcing choices. (Subramani and Venkatraman 2003). US companies with workers assigned to specific functions/departments (C-Suite or executive team, human resources, finance, information technology, procurement, sales & Marketing, or legal) will participate in the business process lifecycle by setting the goal, strategic planning, designing, configuration, testing, deployment, and management of processes (i.e., payroll administration, bookkeeping, process management, purchasing supplies, regulatory reporting, and many more processes). Workers assigned to the aforementioned functions/departments will find themselves held accountable for internal practices, policies, and procedures as well as external accountability to governing bodies for OSHA for safety, Sarbanes Oxley for financials, EEO for equal employment opportunity, etc. so at least one year minimum to know where the processes originated and how the function/department can meet the requirements.

3.4 INFORMED PILOT: PHASE I

Table 3 below shows the validation tests and phases conducted for this study.

Table 3: Validation & Reliability Phases

PHASE	NAME	Validation Tests Performed	Content Validity	Construct Validity	Reliability
I	Informed Pilot	Qualitative	**X**	**X**	**X**
II	Pilot	Cronbach's Alphas Factor Analysis Quantitative	**X**	**X**	**X**
III	Main Survey	Cronbach's Alphas Factor Analysis Quantitative	**X**	**X**	**X**

This study adopted a survey research design. The informed pilot that was conducted in August 2023 was designed to facilitate revision that would lead to a survey for field study (Straub, 1989). Four graduate level subjects who met the professional qualifications, research criteria (see Appendix C) and who are also familiar with academic research methods served as the pilot respondents for the initial draft version of the survey. The subjects were selected for their expertise, work experience, company location, and tenure in their roles. The informed pilot draft instrument was conducted via video conference prior to the quantitative field study pilot and main field study. An overview of the research was provided to the respondents, construct definitions, and instructions were to (1) identify any important but missing topics or issues related to the focus of the research study, (2) point out (or edit) the ambiguities in the wordings of the survey questions, and (3) suggest ways to contain the length of the survey (Gupta, 2009). An item-by-item review of the entire survey was under examination. The objective was to establish the content and construct validity and reliability of the measures used in this

study, the procedure suggested by Straub (1989) and Hair, Money, Samouel, and Page (2007) was employed.

During the pilot, clarification of constructs and items were thoroughly reviewed in sequence to ensure that the instrument was addressing and measuring the variables in question appropriately (construct validity and reliability). In the informed pilot, the language of the instrument items was examined to see if the vernacular was fit for the audience's understanding (content validity and reliability). One of the purposes of this pre-test was for the subjects to verify understanding of proposed response options. The subjects made certain that only one idea was being reviewed by removing "and/or" in statements under assessment for clarity. Due to the lengthiness of the survey, two questions to check for attention were placed at certain points within the instrument. The attention check questions would serve as a tool to verify that respondents aren't just randomly selecting answers. While debriefing, subjects had the opportunity to identify problems even unfamiliar words. Subjects suggested that construct definitions or language for construct support be added ahead of the instrument items for leveling and to remove ambiguity. Misunderstandings of questions would contribute to measurement error in the instrument (Straub, 1989). For information systems and technical research, content validity and reliability are crucial. For reliability, each variable (independent and dependent) has three or more measures for assessment. All feedback given was considered and actioned based on the feedback from the initial survey. The initial draft instrument was revised for precision and uniformity and the final version of the survey was produced for the field study pilot.

3.5 FIELD STUDY PILOT: PHASE II

The field study pilot survey was administered online in October 2023 prior to the main field study with the intention of determining if measures across subjects are similar across the method used to measure the variables (construct validity). Qualtrics Core XM hosted the instrument. The survey was distributed online for data collection via Connect by Cloud Research (Connect). The survey was organized with qualifying questions at the top to identify recruits that met the criteria for participation in the field study pilot. To participate in this research, subjects must have been employed in a United States company that had been established for no less than three years. In addition, subjects must have worked in one of the targeted functions/departments (human resources, finance, C-Suite/executive team, information technology, procurement, sales & marketing, or legal) for a least one year to participate in the pilot. Eligibility for survey administration required subjects to have been a part of any of the business process lifecycle phases as seen below:

- Strategic planning - (plan your process and strategies (human-, document, or integration-centric) needed to achieve goals; assign stakeholders; set actions).
- Defining - goal / purpose of process / why created.
- Designing - iteratively analyze and map your process; rules; policies; laws; governance; localizations; etc.
- Configuration - iteratively analyze and map your process; rules; policies; laws; governance; localizations; etc.
- Testing - iteratively test the process design and configuration proof of concept providing feedback until acceptable.

- Implementation/deployment - process is made live for larger organization.
- Process management - support, monitoring results, troubleshooting, and optimizing process.

This criterion was put in place to ensure that the level of skills, knowledge, and experience for the topic under review was met and to assure that the participants had fundamental knowledge. As a certified technology consultant with over 12 years of business process experience, these phases are typical to agile process identification, design and deployment. The demographic questions and items that separately measured independent and dependent variables followed the qualifying questions respectively.

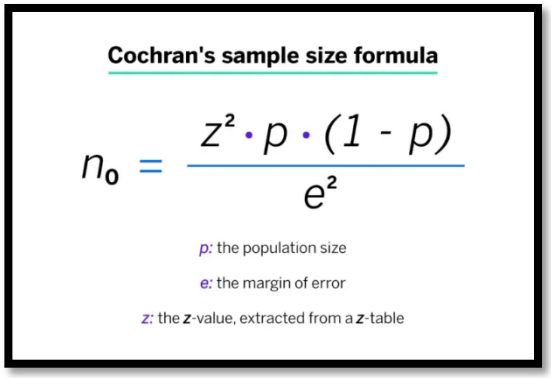
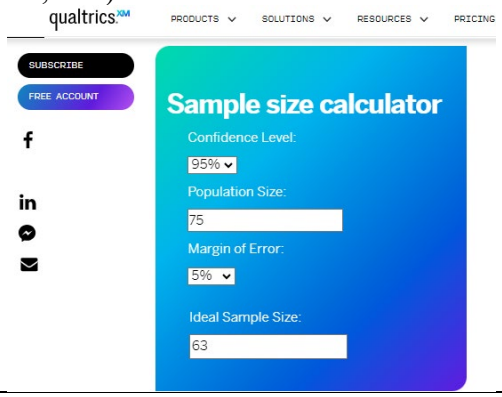
The survey completion was allowed for one week for approximately an hour per participant. The items in the survey were not allowed to be skipped. However, survey completion from beginning to end could not be guaranteed. Therefore, any subjects who did not complete the instrument were removed. Other cases that were removed are 'failed attention check' questions and 'not consenting' to the consent form.

3.5.1 Pilot Demographics

Sixty-three respondents were randomly recruited and selected from the research recruiting source, Connect by Cloud Research (Connect). Connect is one of the top online, crowdsourcing research platforms in the industry and known to be affordable. The sample size was determined by the targeted population size of 75. With a confidence level of 95% and margin of error of 5%, my ideal sample population was 63 as determined by the Qualtrics XM sample size calculator. (see Table 4 below) This calculator is based on Cochran's formula ((Cochran, 1954) (Qualtrics. How to Determine Sample Size, n.d.). Samples larger than 30 ensures the researcher the benefits of central

limit theorem (Roscoe, 1975, p.163 or Abranovic, 1997, p. 307-308). A sample of 500 assures that sample error will not exceed 10% of standard deviation, about 98% of the time (Roscoe, 1975). Survey sample size has been debated in several research areas. According to Connelly (2008), extant literature suggests that a pilot study sample should be 10% of the sample projected for the larger parent study. Hertzog (2008) cautions that sample size is not a simple or straight forward issue to resolve because studies are influenced by many factors. Further, according to Roscoe (1975) and Weisberg & Bowen (1977), a formula for determining sample size can be derived provided the investigator is prepared to specify how much error is acceptable and how much confidence is required (Roscoe 1975, Alreck & Settle 1995, Alreck & Settle advised to see Frankfort-Nachmias & Nachmias 1995; Hill 1998). Per Hill (1998), a probability (or significance) level of 0.05 has been established as a generally acceptable level of confidence in most behavioral science. Therefore, we decided to base the sample sizing on Roscoe (1975), Weisberg & Bowen (1977), Alreck & Settle 1975, Frankfort-Nachmias & Nachmias 1995, and Hill (1998) which supports the Qualtrics XM sampling calculator.

Table 4: Sample Size Formula

Sample Size Formula (Cochran, 1954); 	(***Qualtrics***. How to Determine Sample Size, n.d.) 

The questions used to qualify participation in the online pilot were based on the subject's business process experience, function or department employed in, length of service within the function or department, company location, and company years of service. (NOTE: The pilot study's descriptive statistics are provided in ***Table 5*** below in the Pilot Results section.) The subjects had no personal contact with me, participated at their leisure, and responded on their own. The Male subjects dominated the majority of the sample population at 57.1% and females at 42.9% of the remaining population. The respondents participating had ages ranging from 18-59 years of age where the majority of the respondents were found in the 36-39 age range making up 29%, and 21% fell in 40-45; 17% fell in 30-35; 10% fell in both 46-49 and 50-55; 6% fell in 26-29; 3% fell in 22-25 and 56-59; and lastly 2% fell in 18-21 group. Individuals in their 30s made up almost half (46%) of the population followed by those in their 40s (30%) on average. Also, from the 63 respondents, there were 57.1% White, 12.7% Black, 11.1% Asian, 6.3% Latino, 6.3% Hispanic, 3.2% Prefer not to say, and 1.6% Arab and 1.6% Multi Race persons respectively. Additionally, their educational levels were doctoral 3.2%, masters 39.7%, bachelors 31.7%, associates 15.9%, Certificate 4.8%, and High School diploma 4.8%. Some of the sample population's working demographics and experience as well as US company structure where the employee type was 98.4% full time and 1.6% part time employees with the executive management level having the majority participants showing 38.1%, Sr. management 7.9%, middle management 17.5%, manager 22.2%, and individual contributors 14.3%. The departments or functions that employed respondents for at least one year were C-Suite executives at 28.6%, Finance 17.5%, HR 14.3%, IT 30.2%, Legal 0%, Purchasing 3.2%, Sales & Marketing 6.3%. Also, subjects that had

responsibility in one or more areas of the business process (BP) lifecycle was of interest and made up the following phases: defining 63%, strategizing 27%, design 55.6%, configuration 55.6%, testing 57.1%, implementation / deployment 61.9%, and management 30.2%. The pilot population represented different company types with the majority of respondents being employed at publicly traded institutions at 50.1%, non-public at 30.2%, government 7.9%, foreign private issuer3.2%, Not for Profit organizations at 3.2%, and Other 6.3%. Lastly, the participants' companies' employee count ranged from 'under 500' to 200 thousand (K)+ with the most employees falling in the 'under 500 and 2,501 – 5K at 22.2% individually, followed by '501 – 1K' and '1,001 – 2.5K' at 19% separately, '5,001 – 7.5K' (1.6%), '7,501 – 10K' (4.8%), '15,001 – 20K' (1.6%), '20,001 – 30K' (3.2%), '50.001 – 100K' (3.2%), '100,001 – 150K' (1.6%), and 200K and above at 1.6%.

3.5.2 Pilot Results

This study used a quantitative technique to analyze the data. Smart PLS-SEM was used to analyze the relationship between the effect of internal controls, top management mindfulness, organizational agility, modularity, and knowledge absorptive capacity and business process performance. For the field study pilot, construct validity was established for the business process performance (BPP), internal controls (IC), knowledge absorptive capacity (KAC), business process modularity (MOD) and organizational agility (OA) based on the correlations between indicators of the construct. Top management mindfulness (TMM) had a limited number of indicators, however, the strongest of the three indicators remained. The model's proposed internal consistency was based on the loadings, Cronbach's alpha, and composite reliability (rho_c) scores shown below in

Table 5. Loadings above .708 are recommended, as they indicate that the construct explains more than 50 percent of the indicator's variance thus providing acceptable item reliability. (Hair et al., 2019) The average inter-item correlation for each construct shows that Knowledge Absorptive Capacity's items have the strongest relationship with a Cronbach's alpha of 0.849 and composite reliability (rho_c) at 0.884. The coefficient alpha for the majority of item loadings on constructs had a Cronbach's and composite reliability above the .7 threshold as well as an average variance extracted (AVE) above .5. According to Hair (2019), the AVE (mean variance extracted) for the items loading on a construct is a summary indicator of convergence. Modularity had solid Cronbach's alpha and composite reliability scores, however, its AVE score was .451 which if rounded is not far off from .5 which is highly recommended. It's approximately .5 and the items could explain a little more error than variance in the construct. However, because of the strength of Cronbach's and composite reliability, the construct remained. Organizational agility presented a firm composite reliability score of .802 and AVE score of .577. Although the conservative Cronbach's alpha score fell short at .630, the liberal composite reliability score was at .802 and according to Hair et al. (2019), the true reliability score is somewhere in between. Thus, due to the strong composite reliability and AVE scores, the construct remained. All scores were in the same direction meaning the loadings of items has good correlation to the construct which Hair (2019) suggests that standardized indicator loadings should be at least .5 and ideally .7 or higher. There is convergent validity and reliability and dropping any items for improvement would be trivial, a .01 if that (Hair, Black et. al, 2019). The set of items for each construct seem to be accurately reflecting the constructs they were intended to measure.

The items in the Table 5 loading on the constructs are evidence of convergent validity based on one criterion, the size of factor loadings. The common point that they converge on is the construct that they are designed to measure. The AVE's robust scores are comfortably above .5 and indicates that the construct explains at least 50 percent of the variance of its items. The composite reliability values from the individually weighted construct indicators support the internal consistency reliability wherein higher values usually indicates higher levels of reliability. Reliability values between 0.60 and 0.70 are considered "acceptable in exploratory research," values between 0.70 and 0.90 range from "satisfactory to good." Values of 0.95 and higher are problematic, as they indicate that the items are redundant, thereby reducing construct validity (Diamantopoulos et al., 2012; Drolet and Morrison, 2001).

Table 5: Pilot Descriptive Statistics & Reliability

Descriptive Statistics (n=63)						
Constructs	**Item Codes**	**Mean**	**Standard deviation**	**Cronbach's alpha**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Business Process Performance	BPP1	1.778	0.916	0.818	0.873	0.579
	BPP4	1.984	0.882			
	BPP5	2.175	1.016			
	BPP6	2.254	1.069			
	BPP7	2.206	1.157			
Internal Controls	ICCA3	2.000	1.069	0.770	0.843	0.518
	ICCE3	1.825	0.918			
	ICIC2	1.905	0.921			
	ICM1	1.825	0.864			
	ICRA2	1.984	0.787			
Knowledge Absorptive Capacity	KAC12	2.063	0.990	0.849	0.884	0.523
	KAC13	2.063	1.052			
	KAC14	2.159	1.237			
	KAC3	2.095	1.035			

	KAC4	2.302	1.018			
	KAC6	1.937	0.794			
	KAC7	2.063	1.167			
Modularity	MOD2	2.635	1.406	0.716	0.803	0.451
	MOD3	2.556	1.294			
	MOD4	2.206	1.224			
	MOD6	2.222	1.046			
	MOD7	2.127	0.787			
Organizational Agility	OA1	1.476	0.587	0.630	0.802	0.577
	OA3	2.175	1.062			
	OA5	2.270	1.144			
Top Management Mindfulness	TMM3	1.905	1.019			

The purpose of this paper is to provide a comprehensive, yet concise, overview of the considerations and metrics required for partial least squares structural equation modeling (PLS-SEM) analysis and result reporting. Preliminary considerations are summarized first, including reasons for choosing PLS-SEM, recommended sample size in selected contexts, distributional assumptions, use of secondary data, statistical power and the need for goodness-of-fit testing. Next, the metrics as well as the rules of thumb that should be applied to assess the PLS-SEM results are covered. Besides presenting established PLS-SEM evaluation criteria, the overview includes the following new guidelines: PLSpredict (i.e., a novel approach for assessing a model's out-of-sample prediction), metrics for model comparisons, and several complementary methods for checking the results' (Hair et al., 2019).

CHAPTER 4: MAIN STUDY ANALYSIS & RESULTS: PHASE III

This chapter will discuss the research participants, procedures to investigate the hypotheses outlined in the previous section and measurement tool. Further, a presentation

of the respondents, details for the sampling approach, and company demographic data to better understand the possible characteristics of the respondent pool. The procedures to collect data and operationalization of the constructs are given. Further, the design of the survey instrument that will collect data, along with scale development and a rationalization for performing the pilot study and how to conduct the survey are explained.

4.1 Demographics Overview

In the United States, according to the Bureau of Labor Statistics and Statistica.com there are approximately 132 million full-time employees (FTE) as of 2022. With a confidence level of 95% and a margin of error of 5% on the 132 million FTEs, the ideal sample size was 339 as derived using the Qualtrics sample calculator. However, we included part-time and contractors that has experience within the 339. A mix of FTEs e.g., US executives, senior managers, middle managers, front line managers, individual contributors/professional workers who have at least 1 year of employment at their level was recruited from the aforementioned sample size. We did not address workers who were not members of the previously mentioned levels because they would not have any idea about this topic. In addition, workers in various departments (human resources, finance, information technology, procurement, sales, and marketing, legal and C-suite) or functional areas and industries were chosen as a context in which to pilot and field test the proposed model prior to conducting the main study research.

Table 6: Main Study Demographics

Main Study Demographic Characteristics (n=339)					
Control / Demographics	**Response(s)**	**Mean**	**Standard Deviation**	**Freq. (f)**	**% of Sample**

CO EST.	**3 YR**	1.00	0.00	339	100.00%
CO LOCATION	**United States of Americas**	1.00	0.00	339	100.00%
ORGANIZATION TENURE	**1 Year Function - Department**	1.00	0.00	339	100.00%
FUNCTIONAL ORGANIZATION	**Function - Department**	**4.01**	**1.51**	**339**	**100.00%**
	C-Suite			19	5.60%
	Human Resources			41	12.09%
	Finance			50	14.75%
	Information Technology			128	37.76%
	Procurement			19	5.60%
	Sales and Marketing			73	21.53%
	Legal			9	2.65%
BUSINESS PROCESSES PHASE	**Participation**			**339**	**100.00%**
	Strategy			175	16.86%
	Defining			116	11.18%
	Design			122	11.75%
	Configuration			117	11.27%
	Testing			126	12.14%
	Implementation / Deployment			172	16.57%
	Process Management			**210**	**20.23%**
AGE	**Age Range**	**5.24**	**1.95**	**339**	**100.00%**
	18 - 21			2	0.59%
	22 - 25			16	4.72%
	26 - 29			42	12.39%
	30 - 35			90	26.55%
	36 - 39			46	13.57%
	40 - 45			63	18.58%
	46 - 49			24	7.08%
	50 - 55			25	7.37%
	56 - 59			31	9.14%
GENDER IDENTITY	**Gender**	**1.39**	**0.50**	**339**	**100.00%**
	Male			210	61.95%
	Female			127	37.46%
	Other			2	0.59%
EDUCATION	**Degree**	**3.82**	**1.44**	**339**	**100.00%**
	High School Diploma			36	10.62%
	Associate Degree			32	9.44%
	Specialty / Technical Certificate			18	5.31%
	Bachelor Degree			184	54.28%
	Doctoral Degree			10	2.95%
	Master Degree			59	17.40%
EMPLOYEE LEVEL	**Management Level**	**3.93**	**1.21**	**339**	**100.00%**
	Executive			24	7.14%
	Senior management			19	5.65%
	Middle Manager			59	17.26%

	Manager			93	27.38%
	Individual contributor			144	42.56%
EMPLOYEE TYPE	**Employee Type**	**1.06**	**0.26**	**339**	**100.00%**
	Full Time			318	93.81%
	Part Time			20	5.90%
	Contractor			1	0.29%
COMPANY SIZE	**Employee Count Range**	**4.08**	**4.00**	**339**	**100.00%**
	Under 500 (Small)			117	34.51%
	501-1,000 (Small)			47	13.86%
	1,001-2,500 (Medium)			55	16.22%
	2,501-5,000 (Medium)			21	6.19%
	5,001-7,500 (Medium)			15	4.42%
	7,501-10,000 (Large)			17	5.01%
	10,001-15,000 (Large)			14	4.13%
	15,001-20,000 (Large)			5	1.47%
	20,001–30,000 (Large)			6	1.77%
	30,001-40,000 (Large)			3	0.88%
	40,001-50,000 (Large)			4	1.18%
	50,001–100,000 (Large)			9	2.65%
	100,001-150,000 (Large)			6	1.77%
	150,001-200,000 (Large)			5	1.47%
	More than 200,000 (Large)			15	4.42%
COMPANY STATUS	**Company Type**	**2.09**	**1.24**	**339**	**100.00%**
	Publicly traded company			118	34.81%
	Non-publicly traded company			163	48.08%
	Foreign Private Issuer			4	1.18%
	Not-for-profit organization			23	6.78%
	Governmental organization			26	7.67%
	Other			5	1.47%
ANNUAL REVENUE	**Revenue**	**5.05**	**3.30**	**339**	**100.00%**
	Under $500,000			34	10.03%
	$500,000 - $1 million			24	7.08%
	More than $1 million but less than $10 million			67	19.76%
	More than $10 million but less than $100 million			56	16.52%
	More than $100 million but less than $500 million			31	9.14%
	More than $500 million but less than $1 billion			16	4.72%
	More than $1 billion but less than $5 billion			28	8.26%
	More than $5 billion but less than $10 billion			10	2.95%
	More than $10 billion			26	7.67%
	Not sure			47	13.86%
INTERNAL CONTROLS	**Fundamental Controls Overall** *Prior to Covid-19, our organization formally utilized a framework (provided*		**Likert Result**	**Agree**	

FUNDAMENTAL CONTROLS OVERALL	*by government, professional services, Information Technology / Information Systems department, etc.) ...*				
	To effectively manage enterprise risk and controls.	3.24	2.11	126	37.17%
	To effectively manage business processes activities.	2.99	2.03	148	43.66%
	To effectively manage Information and communication.	3.12	2.17	127	37.46 %
	To effectively manage control environment.	3.45	2.22	117	34.51%
	To effectively manage IT governance and general controls.	3.00	2.03	130	38.35%

INDUSTRY	**AGRICULTURE, FORESTRY, AND FISHING**	**0**	**0.00%**
	- Agricultural Production Crops	2	0.59%
	- Agricultural Services	3	0.88%
	- Forestry	1	0.29%
	TOTAL	**6**	**1.77%**
	MINING	0	0.00%
	TOTAL	**0**	**0.00%**
	CONSTRUCTION	0	0.00%
	- Building Construction General Contractors and Operative Builders	8	2.36%
	- Construction Special Trade Contractors	5	1.47%
	TOTAL	**13**	**3.83%**
	MANUFACTURING	9	2.65%
	- Apparel And Other Finished Products Made from Fabrics and Similar Materials	3	0.88%
	- Chemicals And Allied Products	3	0.88%
	- Electronic And Other Electrical Equipment and Components, Except Computer Equipment	11	3.24%
	- Fabricated Metal Products, Except Machinery and Transportation Equipment	3	0.88%
	- Food And Kindred Products	6	1.77%
	- Furniture And Fixtures	2	0.59%
	- Industrial And Commercial Machinery and Computer Equipment	5	1.47%
	- Lumber And Wood Products, Except Furniture	1	0.29%
	- Miscellaneous Manufacturing Industries	1	0.29%
	- Paper And Allied Products	1	0.29%
	- Petroleum Refining and Related Industries	1	0.29%
	- Printing, Publishing, And Allied Industries	3	0.88%
	- Rubber And Miscellaneous Plastics Products	1	0.29%
	- Transportation Equipment	1	0.29%
	TOTAL	**51**	**15.04%**
INDUSTRY	**TRANSPORTATION, COMMUNICATIONS, ELECTRIC, GAS, AND SANITARY SERVICES**	3	0.88%
	- Communications	16	4.72%
	- Electric, Gas, And Sanitary Services	2	0.59%
	- Motor Freight Transportation and Warehousing	1	0.29%
	- Transportation Services	2	0.59%
	- United States Postal Service	1	0.29%
	TOTAL	**25**	**7.37%**

	WHOLESALE TRADE	2	0.59%
	- Miscellaneous Retail	7	2.06%
	- Wholesale Trade-durable Goods	4	1.18%
	- Wholesale Trade-non-durable Goods	1	0.29%
	TOTAL	**14**	**4.13%**
	RETAIL TRADE	7	2.06%
	- Apparel And Accessory Stores	5	1.47%
	- Automotive Dealers and Gasoline Service Stations	2	0.59%
	- Building Materials, Hardware, Garden Supply, And Mobile Home Dealers	0	0.00%
	- Eating And Drinking Places	3	0.88%
	- Food Stores	2	0.59%
	- General Merchandise Stores	12	3.54%
	TOTAL	**31**	**9.14%**
	FINANCE, INSURANCE, AND REAL ESTATE	13	3.83%
	- Depository Institutions	3	0.88%
	- Holding And Other Investment Offices	2	0.59%
	- Insurance Agents, Brokers, And Service	6	1.77%
	- Insurance Carriers	2	0.59%
	- Non-depository Credit Institutions	5	1.47%
	- Real Estate	7	2.06%
	- Security And Commodity Brokers, Dealers, Exchanges, And Services	1	0.29%
	TOTAL	**39**	**11.50%**
I N D U S T R Y	**SERVICES**	1	0.29%
	- Amusement And Recreation Services	4	1.18%
	- Business Services	36	10.62%
	- Educational Services	22	6.49%
	- Engineering, Accounting, Research, Management, And Related Services	29	8.55%
	- Health Services	29	8.55%
	- Legal Services	8	2.36%
	- Miscellaneous Repair Services	1	0.29%
	- Miscellaneous Services	7	2.06%
	- Motion Pictures	3	0.88%
	- Personal Services	2	0.59%
	- Private Households	1	0.29%
	- Social Services	3	0.88%
	TOTAL	**146**	**43.07%**
	PUBLIC ADMINISTRATION	0	0.00%
	- Non-classifiable Establishments	2	0.59%
	- Administration Of Human Resource Programs	5	1.47%
	- Executive, Legislative, And General Government, Except Finance	2	0.59%
	- Justice, Public Order, And Safety	3	0.88%
	- Public Finance, Taxation, And Monetary Policy	2	0.59%
	TOTAL	**14**	**4.13%**
	TOTAL INDUSTRY WORKERS	**339**	**100%**

4.1.1 Demographic Data Results

When calculating the demographic data points for employee level, individual contributors and managers had the greatest number of respondents. Out of 339 cases, 144 respondents were at the individual contributor employee level and 93 were at the manager level. A worker could only belong to one level at work. In total respondents assigned to the individual contributor and manager employee levels made up 69.94% where individual contributors were 42.56% and manager level workers was 27.38%, respectively.

When computing the demographic data points for functional departments, IT and Sales & Marketing had the greatest number of respondents. Out of 339 cases, 128 respondents worked in the IT department for at least one year and sales & marketing had 73 respondents who worked in the department for at least one year. This was a single select item where respondents were forced to only select one department to be a member. Experience in one of the pre-identified functional departments was acceptable. In total IT and Sales & Marketing respondents made up 59.29% of respondents where IT was 37.76% and Sales & Marketing was 21.53%, respectively.

When counting the demographic data points for phases of the business process life-cycle, process management and strategy had the greatest number of respondents. Out of 339 cases, 210 respondents had experience in process management and 175 respondents had experience in strategizing. This was a multi-select item where respondents could have experience in more than one phase of the business process lifecycle. However, experience in one of the phases was acceptable. In total process

management and strategy respondents made up 37.09% where process management was 20.23% and strategy was 16.86%, respectively.

When assessing the demographic data points for company type, non-publicly traded company and publicly traded businesses had the greatest number of respondents. Out of 339 cases, non-publicly traded companies had 163 respondents and publicly traded business had 118 respondents. Respondents could only select one of the preidentified company status options. In total non-publicly and publicly traded company respondents made up 82.89% where non-publicly was 48.08% and publicly traded businesses was 34.81%, respectively.

When valuing the demographic data points for a Company's size based on employee count, small and medium enterprises had the greatest number of respondents. Out of 339 cases, 164 respondents worked in a small company and 91 respondents worked for a medium sized company. This was a single-select item where respondents would report on one US based company of which they are an employee. In total small and medium company respondents made up 75.2% where small enterprises who had under 500 employees made up 34.51% and small companies who had from 501-1000 workers made up 13.86% totaling 48.37% of respondents and medium enterprises who had 1,001-2500, 2,501-5K, and 5,001-7.5K employees made up 16.22%, 6.19%, and 4.42% totaling 26.83% of respondents, respectively.

When researching the demographic data points for employee type, full time and part time workers had the greatest number of respondents. Out of 339 cases, 318 respondents worked on a full-time basis and 20 respondents were employed part time. This was a single-select item where respondents could belong to only one employment

status. Having one employment type is acceptable. In total full time and part time workers made up 99.71% where full time was 93.81% and part time was 5.9% respectively.

When reviewing the demographic data points for age range, respondents whose age range was 30-35 and 40-45 had the greatest number of respondents. Out of 339 cases, 90 respondents fell in the age range of 30-35 years old, and 63 respondents fell in the range of 40-45 years old. Respondents could only belong to one of the age range options. Respondents falling in the lower age range may not have as much experience as the middle to upper ranges only due to the fact that they are newer to the work environment and many may not have enough professional experience. Of course, there may be outliers. The age range intentionally begins at 18 years of age for inclusivity and the fact that they could have process experience. Even though 18-25 made up about 5%, they do have valid process experience. This shows that process experience is beginning at an age that may not be taken too seriously. Young adults are entering the technical world at much young ages. In total age ranges 30-35 and 40-45 respondents made up 45.13% where 30-35 was 26.55% and 40-45 was 18.58% respectively.

When reviewing the demographic data points for gender, male and female had the largest number of respondents. Out of 339 cases, 210 were male respondents and 127 were female. Respondents could only belong to one of the gender options. In total males and female respondents made up 99.41% where males were 61.95% and females was 37.46%, respectively.

When reviewing the demographic data points for education, respondents who attained a bachelor and master degree had the greatest number of respondents. Out of 339

cases, 184 respondents had a bachelorette degree and 59 had a master de This was a single select item where respondents were forced to only select their highest degree. Having one of the common, US pre-selected degrees was acceptable. In total bachelor and master respondents made up 71.68% of respondents where bachelor degree was 54.28% and master degree holders was 17.40%, respectively.

When reviewing the demographic data points for annual revenue, companies whose annual revenue was more than $1 million but less than $10 million and more than $10 million but less than $100 million had the greatest number of respondents. Out of 339 cases, 67 respondents worked at companies whose annual revenue was more than $1 million but less than $10 million and 56 respondents worked for companies whose annual revenue was more than $10 million but less than $100 million. This was a single-select item where respondents could only select one option. In total, companies whose annual revenue was more than $1 million but less than $10 million and more than $10 million but less than $100 million respondents made up 36.28% where companies whose annual revenue was more than $1 million but less than $10 million was 19.76% and companies whose annual revenue was more than $10 million but less than $100 million was 16.52%, respectively.

When reviewing the demographic data points for employee to lookback on fundamental controls prior to covid-19, IT governance and general controls and business process activities had the greatest number of respondents. Out of 339 cases for business process activities, 148 respondents agreed that prior to covid-19, their department utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage business process activities and 75 respondents strongly agreed on a 7-point

Likert scale. Out of 339 cases for IT governance and general controls, 130 respondents agreed that prior to covid-19, their department utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage IT governance and general controls on a 7-point Likert scale and 78 respondents strongly agreed. From the available options, only one scale item could be selected. In total business process activities and IT governance and general controls respondents who agreed made up and average of 41% workers who says their department utilized a framework (provided by government, professional services, IT/IS, etc.) where business process activities was 43.7% and IT governance and general controls was 38.3%, respectively. In total business process activities and IT governance and general controls respondents who strongly agreed their department utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage business process activities and IT governance and general controls made up an average of 22.5% of workers where 22.1% was business process activities and 23% for IT governance and general controls, respectively.

4.2 Data Robustness

4.2.1 Construct Reliability

Construct reliability *(see **Table 7**)* was determined by assessing internal consistency and quality using Cronbach's alpha, composite reliability, and average-extracted variance (AVE) (Anderson & Gerbing, 1988). Higher values generally indicate higher levels of reliability. Reliability values between 0.60 and 0.70 are considered "acceptable in exploratory research," values between 0.70 and 0.90 range from "satisfactory to good." Values of 0.95 and higher are problematic, as they indicate that the items are redundant, thereby reducing construct validity (Diamantopoulos et al., 2012;

Drolet and Morrison, 2001). According to Hair et al (2019), loadings above .70 are recommended, as they indicate that the construct explains more than 50 percent of the indicator's variance thus providing acceptable item reliability. As shown in Table 7 below, item loadings are above .70 except for one item that loaded on KAC at .685 which is acceptable. The unweighted items of Cronbach's alpha were above .80 which is higher than the recommended .70. Under composite reliability the items are weighted based on the construct indicator's individual loadings and reliability was higher than suggested .70. In review, all latent structures represent acceptable composite reliability. The calculation for AVE was above the .50 mark indicating convergent validity. The items for each latent construct converged on the appropriate construct. Overall, construct reliability for this study was more than satisfactory with no results shown to be problematic or above .95.

Table 7: Main Study Descriptive Statistics & Reliability

Descriptive Statistics (n=339)								
No.	**Constructs**	**Item Codes**	**Loadings**	**Mean**	**Standard Deviation**	**Cronbach's alpha (α)**	**Composite Reliability (rho_c)**	**Average variance extracted (AVE)**
1	**Business Process Performance**	BPP1	**0.826**	2.720	1.346	**0.888**	**0.918**	**0.691**
2		BPP3	**0.852**	2.280	1.220			
3		BPP4	**0.873**	2.740	1.312			
4		BPP5	**0.835**	2.667	1.271			
5		BPP9	**0.766**	2.283	1.333			
6	**Internal Control**	ICCA1	**0.810**	2.440	1.104	**0.932**	**0.942**	**0.597**
7		ICCA2	**0.711**	2.457	1.137			
8		ICCA3	**0.807**	2.357	1.075			
9		ICCE5	**0.733**	2.230	1.190			
10		ICIC1	**0.793**	2.360	1.092			
11		ICIC2	**0.751**	2.322	1.175			
12		ICM1	**0.729**	2.484	1.156			
13		ICM2	**0.772**	2.546	1.281			
14		ICRA1	**0.833**	2.513	1.071			

15		ICRA2	**0.784**	2.519	1.173			
16		ICRA4	**0.766**	2.469	1.173			
17	**Knowledge Absorptive Capacity**	KAC12	**0.792**	2.873	1.405	**0.863**	**0.902**	**0.649**
18		KAC13	**0.872**	2.634	1.315			
19		KAC14	**0.848**	2.540	1.292			
20		KAC5	**0.817**	2.487	1.186			
21		KAC8	**0.685**	2.988	1.548			
22	**Modularity**	MOD4	**0.704**	3.130	1.333	**0.807**	**0.872**	**0.632**
23		MOD6	**0.823**	2.885	1.213			
24		MOD7	**0.856**	2.681	1.257			
25		MOD9	**0.789**	3.516	1.533			
26	**Organizational Agility**	OA1	**0.844**	2.254	1.193	**0.884**	**0.915**	**0.684**
27		OA2	**0.882**	2.434	1.247			
28		OA3	**0.798**	2.699	1.403			
29		OA4	**0.853**	2.628	1.323			
30		OA56	**0.753**	2.714	1.300			
31	**Top Management Mindfulness**	TMM1	**0.918**	2.678	1.346	**0.905**	**0.940**	**0.840**
32		TMM2	**0.906**	2.608	1.342			
33		TMM3	**0.926**	2.590	1.306			

4.2.2 Discriminant Validity

Based on the results in **Table 8**, discriminant validity is present and has also been established and our instrument is measuring what it was designed to measure. The constructs are empirically distinct from other constructs in the structural model. The heterotrait-monotrait (HTMT) ratio of the correlations were not high according to Henseler et al. (2015). The HTMT is defined as the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct (Voorhees et al., 2016). The values in the table are all below.90 (Henseler et al. (2015) which offers that the constructs proposed are conceptually not similar. When the HTMT results are around the .85 threshold which is more conservative, there is conceptual distinction. The discriminant validity results are

significantly different from 1.00 (Henseler et al., 2015). Under question but included in the assessment of discriminant validity, is Fornell Larker. According to Fornell and Larcker (1981), the shared variance for all model constructs should not be larger than their AVEs. The use of Fornell and Larcker is to examine the extent to which a construct is empirically distinct from other constructs in the structural model (Hair et al., 2019). Evidence in favor of "discriminant validity" occurs if the correlation is higher than other values in the same row or column. The correlations were significant at the level and was greater than other entries in its rows and columns. The shared variance for all model constructs should not be larger than their AVEs (Hair et al., 2019). This assessment is not used as much today for determining validity. Fornell Larcker, according to Henseler et al. (2015) is not used due to the fact that it shows that the criterion does not perform well, particularly when the indicator loadings on a construct differ only slightly (e.g. all the indicator loadings are between 0.65 and 0.85). However, as another tool for assessing discriminant validity, under Fornell Larker, the model would be stable or acceptable.

Table 8: Main Study Discriminant Validity

Heterotrait-monotrait ratio (HTMT) n=339						
	BPP	IC	KAC	MOD	OA	TMM
BPP						
IC	0.611					
KAC	0.519	0.802				
MOD	0.666	0.721	0.662			
OA	0.612	0.628	0.725	0.719		
TMM	0.685	0.606	0.670	0.676	0.622	
Fornell-Larcker criterion n=339						
	BPP	IC	KAC	MOD	OA	TMM
BPP	**0.831**					
IC	0.572	**0.773**				
KAC	0.460	0.720	**0.805**			

MOD	0.584	0.643	0.560	**0.795**		
OA	0.548	0.571	0.626	0.612	**0.827**	
TMM	0.620	0.558	0.595	0.586	0.553	**0.917**

4.2.3 Collinearity - Variance Inflation Factor

At this point of analysis, the measurement model is above satisfactory. For evaluating the results of the structural model, we looked at the path coefficients' statistical significance and relevance. Additionally, a review of regression equations took place to determine the relationships between the constructs of the structural model coefficients. Prior to assessing the relationships amongst constructs, an examination of collinearity was conducted via PLS-SEM's variance inflation factor (VIF) results. To have a clear view of the construct relationships, a determination of whether there is correlation between independent variables (IVs) and that the predictor variables do not express a linear relationship in the regression model. If the IVs are correlated, they cannot predict the value of the dependent variable independently in the model. The aim here is to understand how much the variance of a coefficient is inflated and if there is multicollinearity between the predictor variables in the analysis. If the VIF results are shown to have multicollinearity, the model is adversely affected. VIF values above 5 are indicative of probable collinearity issues among the predictor constructs, but collinearity problems can also occur at lower VIF values of 3-5 (Mason and Perreault, 1991; Becker et al., 2015). Ideally, the VIF values should be close to 3 and lower. The results in Table 9 show all construct values less than 3 so there are no problems of collinearity and the IVs can predict the dependent variable. If collinearity is a problem, a frequently used option is to create higher-order models that can be supported by theory (Hair et al.,

2017a). **Table 9** shows the results of VIF and there will be no bias when examining the structural model.

Table 9: Main Study Collinearity

VIF Collinearity (n = 339)

BPP1	2.000
BPP3	2.623
BPP4	2.896
BPP5	2.539
BPP9	2.023
ICCA1	2.817
ICCA2	1.881
ICCA3	2.732
ICCE5	1.822
ICIC1	2.678
ICIC2	2.341
ICM1	2.274
ICM2	2.470
ICRA1	2.788
ICRA2	2.446
ICRA4	2.303
KAC12	2.049
KAC13	2.970
KAC14	2.485
KAC5	1.900
KAC8	1.432
MOD4	1.459
MOD6	1.796
MOD7	1.854
MOD9	1.582
OA1	2.422
OA_2	2.823
OA_3	1.963
OA_4	2.429
OA_6	1.706
TMM1	2.881
TMM2	2.760
TMM3	3.193

Figure 2: Structural Equation Model

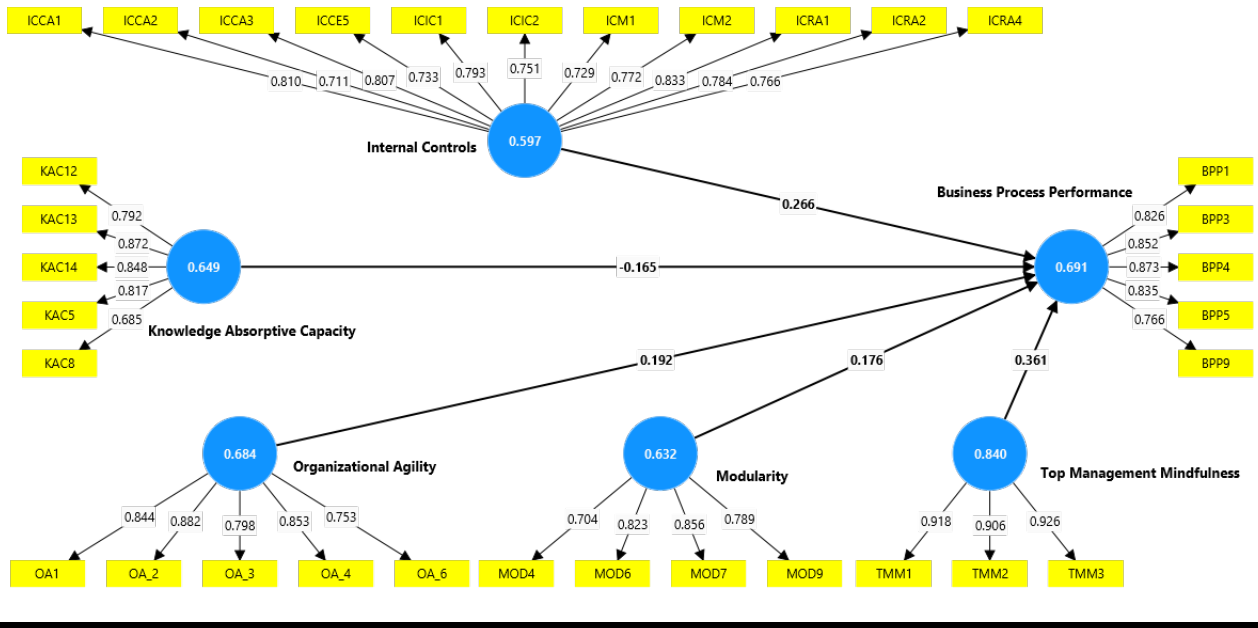


Figure 2 The Structural Equation Model

4.3 Hypothesis Testing

4.3.1 Total Effects - Confidence Interval, STDEV, T values, p values

SmartPLS-SEM's Bootstrapping algorithm was operationalized to test the hypotheses implied in this research. Bootstrapping is a nonparametric procedure that allows testing the statistical significance of various PLS-SEM results such as path coefficients, Cronbach's alpha, HTMT, and R^2 values (Efron and Tibshirani, 1986; Davison and Hinkley, 1997; Hair et.al (2022). In our study we used the settings of 5,000 subsamples drawn from the original data set, a confidence interval method for percentile bootstrap method, two-tailed tests, a .05 significance level with a fixed seed random number generator and results that includes all available bootstrapping: path coefficients,

indirect effects, total effects, outer loadings, and outer weights, AVE, Cronbach's alpha, HTMT, model fit, and R^2. In review of the results, we focused on the total effects between the exogenous variables and the business process performance endogenous variable. The structural equation model results from the bootstrapping is in Table 10 below.

Table 10: Main Study Total Effects

Relationships	β Original sample (O)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	
Internal Controls -> Business Process Performance	0.266	0.068	3.933	0.000	***
Top Management Mindfulness -> Business Process Performance	0.361	0.110	3.267	0.001	**
Organizational Agility -> Business Process Performance	0.192	0.067	2.888	0.004	**
Modularity -> Business Process Performance	0.176	0.064	2.731	0.006	*
Knowledge Absorptive Capacity -> Business Process Performance	-0.165	0.069	2.390	0.017	*

*** = P<.0001; ** = P<.001; * P<.05

Upon reviewing the results from the bootstrap calculation, we find evidence of significant relationships between 'internal controls' and business process performance where 't' is equal to 3.933, p<.0001. Secondly, we found significant relationships between 'knowledge absorptive capacity' and business process performance where 't' is equal to 2.390, p<.05. In addition, we found significant relationships between 'modularity' and business process performance where 't' is equal to 2.731, p<.01. Further, we found significant relationships between organizational agility and business process performance where 't' is equal to 2.888, p<.01. Lastly, we found significant relationships between 'top management mindfulness' and business process performance

where ‘t’ is equal to 3.267, p<.01 and equal to .001. The dependent variable increased when the independent variables increased one standard deviation and other independent variables were held constant. This held true for all exogenous variables (IC, TMM, OA, and MOD) relationships with the dependent variable, business process performance (BPP) except for knowledge absorptive capacity (KAC). Based on the KAC->BPP sample, the direct path is negative but has a significant meaningful affect that indicates the inverse of what was hypothesized. This signifies an insignificant or a false positive, weak relationship between KAC and BPP. Based on the size of the estimated path coefficients, business process performance and top management mindfulness (TMM) at .361 has the strongest relationship followed by internal controls (IC) at .266, organizational agility (OA) at .192, and modularity (MOD) at .176. These results show support for the hypotheses (H1), (H2), (H3), and (H4). However, (H5) is unsupported due to the negative path. I can conclude that there is a statistically significant probability that the relationship between the exogenous and endogenous variables exists and are not due to chance. I accept the research hypothesis and reject the null hypothesis for (H1), (H2), (H3), and (H4). For (H5), I accept the null hypothesis. A summary of hypotheses results is presented in Table 11.

Table 11: Main Study Summary of Hypotheses Testing

NO.	HYPOTHESIS	RESULTS	SIGNIFICANCE
H1	*The relationship between **Internal Controls** and business process performance would become stronger when internal controls increase.*	Supported	**0.000**
H2	*The relationship between **top management mindfulness** and business process performance such that top management*	Supported	**0.001**

	mindfulness increases, the relationship would become stronger.		
H3	*The relationship between **organizational agility** and business process performance would become stronger when organization agility is higher.*	Supported	**0.004**
H4	*The relationship between **business process modularity** and business process performance would become stronger when business process modularity is higher.*	Supported	**0.006**
H5	*The relationship between **knowledge absorptive capacity** and business process performance such that knowledge absorptive capacity increases, the relationship would become stronger.*	Unsupported	**0.017**

4.4 Main Study Explanatory Power & Effect Size

4.4.1 R^2, f^2, & Path Coefficients

As evident from the model, collinearity was not an issue for the model. We turn our attention to the R^2 value of the dependent variable, business process performance. When assessing the R^2 for the endogenous variable we were determining the variance explained in the business process performance construct. This was the model's explanatory power (Shmueli and Koppius, 2011). Henseler et al., (2009) and Hair et al., (2011) provided a rule of thumb for the explanatory power that says, R^2 ranges from 0 to 1, with higher values indicating a greater explanatory power. Furthermore, R^2 of .75 is substantial, .50 is considered moderate, and .25 is weak explanatory power. The main study's R^2 value was .508 which meant that the variance in the endogenous construct had moderate explanatory power wherein 50.8% of the variation in the dependent variable Business Process Performance is explained by the variation in the independent variables of the model. (see **Table 12**) The Adjusted R^2 (correction of R^2) for the number of

independent variables, still shows 50% predicting power. The business process performance construct had an average in-sample explanatory power.

Working in tandem with R^2 we assessed how removing specific independent variables affected our dependent variables' R^2 value by examining the f^2 effect size. The f^2 is similar to keeping a sharp eye on the path coefficient as variables are added and removed. More specifically the results for f^2 provided insight into the level of relevance the predictor variable have in explaining the dependent variable in the structural model. If you were to look at the path coefficients and compare it to the f^2, they are similar and often the same in rank order. They were not shown to be different, so the use of f^2 to explain the presence of mediation as advised by (Nitzl et al., 2016) was not needed. As a rule of thumb, values higher than 0.02, 0.15, and 0.35 depict small, medium, and large f^2 effect sizes (Cohen, 1988). 'Top Management Mindfulness' had average relevance in explaining business process performance over the other exogenous constructs. In addition to its relevance in explaining the dependent variable, 'internal controls, organizational agility, modularity, and knowledge absorptive capacity' also had relevance at reduced power. Overall, the in-sample explanatory power of the endogenous variable had a small to medium chance of not easily being varied by additional observations. Removing a component from the structural model has a moderate chance of not changing our theories coherence. From our hypotheses testing, our hypothesis has average strength.

Table 12: Main Study R^2 and f^2 results

R-square (R^2)		
	R-square	R-square adjusted
BPP	0.508	0.500
f-square (f^2)		

	f-square
Internal Controls -> BPP	0.057
Knowledge Absorptive Capacity -> BPP	0.022
Modularity -> BPP	0.029
Organizational Agility -> BPP	0.037
Top Management Mindfulness -> BPP	0.141

4.5 Main Study Predictive Power

4.5.1 Q^2, RMSE, & MAE

Reviewing the predictive power or accuracy for the path model, the calculation of Q^2 was executed according to Geisser, (1974) and Stone, (1977). Smart PLS software was used to carry out the blindfolding technique where single points in the data matrix were removed and represented with the mean and resulting in estimates of the model parameters. This metric was used by Rigdon, (2014b) and Sarstedt et al., (2014). Q^2 combines aspects of in-sample explanatory power and out-of-sample prediction (Shmueli et. al., 2016; Sarstedt et al., 2017a). The indicator items data for the dependent variable had medium to large predictive accuracy. The overall Q^2 value was .473 which indicated high predictive accuracy of the reflexive structural model for the business process performance construct. **(see Table 13)** According to Hair et. al, (2019), as a rule of thumb, Q^2 values higher than 0, 0.25, and 0.50 depict small, medium, and large predictive relevance of the PLS-path model.

An out-of-sample cross-validation assessment of predictive power for our PLS path model involved analysis/training samples also known as holdout samples using PLSpredict k-fold. We employed a set of procedures (Shmueli, 2016) to gain an out-of-sample prediction that served to estimate the model. Estimating the model entailed a review on analysis/training samples and assessing its predictive performance on data

other than the analysis sample. Our k-fold cross-validation split the full dataset into 10 subgroups (a number of subgroups (k)) (recommended by Shmueli et. al., 2019) or data sets into 10 equally sized subgroups or subsets of data (subgroups of the total sample (fold) after which PLS predicted each fold (hold-out sample) with the remaining subgroups or sets of data (k -1) that in combination also became the training sample. The study's data set was 339 cases split into 10 equal subsets of 33.9. When executed, the PLSpredict algorithm predicted 10 times each fold with the remaining nine subsets (k -1).

For our model's predictive power, we drew on several prediction statistics that quantified the amount of prediction error. The PLS path had a mean absolute value (MAE) of .490 which measured the average magnitude of the errors in a set of predictions without considering their direction (over or under). (See Table 13) This is the average absolute difference between the predictions and the actual observations with each difference having equal weight (Hair et. al, 2019). The root mean square error (RMSE) is defined as the square root of the average of the squared differences between the predictions and the actual observations (Hair et. al., 2019). Our RMSE value is at .733. Large errors are not desirable for this business research study. We compared the RMSE (or MAE) values with the naïve linear model benchmark. A regression was run for the dependent variable indicators on the indicators for the independent variables in the PLS path model (Danks and Ray, 2018). Based on the guidelines by Shmueli et. al., (2019), the findings for business process performance model has high predictive power because none of the indicators in the PLS-SEM analysis have RMSE (or MAE) values higher than the naïve linear model (LM) benchmark when compared. Additionally, when reviewing the cross-validated predictive power for our PLS model we determined that our model

has strong predictive power and validity. This was based on the comparison of the average loss difference in the PLS path model to both the naïve indicator average and linear model prediction benchmarks.

Table 13: Main Study Predictive Power

PLSpredict LV summary		PLSpredict MV summary					
			Q^2 predict	PLS-SEM_ RMSE	PLS-SEM_ MAE	LM RMSE	LM MAE
Business Process Performance	Q^2predict 0.473	BPP1	0.433	1.017	0.750	1.031	0.758
	RMSE 0.733	BPP3	0.289	1.031	0.724	1.079	0.751
		BPP4	0.374	1.041	0.785	1.116	0.830
	MAE 0.490	BPP5	0.295	1.070	0.796	1.096	0.819
		BPP9	0.211	1.188	0.853	1.204	0.853

CVPAT LV summary			
PLS-SEM vs. Indicator Average (IA)	Indicator Average (IA) loss	t value	p value
Business Process Performance	-1.692	6.071	0.000
PLS-SEM vs. Linear model (LM)	Linear Model (LM) Loss	t value	p value
Business Process Performance	-1.225	2.328	0.020

Overall, the study's measurement model metrics are satisfactory and will have strong predictive power. The assessment of the structural model shows that the independent variable (predictor constructs) in the path model did not have high collinearity and created no problems in interpreting the results of PLS-SEM. Lastly, the structural model results were evaluated based primarily on the extent to which the exogenous constructs or independent variables would predict the endogenous construct(s) or dependent variable(s). The assessment of the prediction was based on:

- The coefficient of determination R^2 - The main study's R^2 value was .508 which meant that the variance in the endogenous construct had moderate explanatory power and the business process performance construct had average in-sample explanatory power.
- The effect size f^2, overall, had shown that the in-sample explanatory power of the endogenous variable had an average chance of not easily being varied by additional observations.
- Cross-validated redundancy Q^2 where the indicator items data for the dependent variable had medium to high predictive accuracy.
- The sizes and significance of the path coefficients relationships with the endogenous construct and the p-value for the hypotheses.

CHAPTER 5: DISCUSSION, IMPLICATIONS, & CONCLUSION

5.1 Profile and Characteristics of Respondents

Three hundred and thirty-nine valid responses from workers where the majority were employed in non-publicly traded (48.08%) and publicly traded (34.81%) US companies were used in the analysis. Publicly traded companies are required to adhere to the Sarbanes-Oxley Act of 2002's Section 404 which means they would be familiar with processes that support internal controls framework. Although not generally bound, many non-publicly traded companies adhere to SOX due to the positive results on the organization's financial performance. This could also be due to the fact that non-publicly traded companies may be preparing to go public as well. An abundance of the respondents approximately 43.07% worked in the services industry for enterprises whose

annual revenue was over $1 million (19.76%) and up to $100 million (16.52%), respectively.

Of those 339 respondents, 318 (93.81%) of them were full time which indicates that most of the participants worked for either a small (48.37%) or medium (26.83%) enterprise as determined by employee headcount. According to the SBA (2023), there are 33,185,550 small businesses in the US. Small businesses employ about 61.7 million Americans, totaling 46.4% of the private sector employees (SBA.GOV, 2023). Over half of the respondents were male (61.95% and held bachelor degrees (54.28%). Most of the participants were members of the individual contributor (42.56%) and manager (27.38%) employee levels who made up more than half of the respondents. These workers had at least 1 year of work experience related to business processes in departments such as IT, human resources, sales & marketing, legal, procurement, legal, finance, or the C-suite executive team wherein the majority were employed in IT and Sales & Marketing. This representation aligns with the 'process management' phase having the largest percentage (20.23%) for business process life cycle participation because lower-level employees in companies are supporting the process after implementation. When coupled with the 'deployment' phase (16.57%) whose tasks are mostly completed by individual contributors and managers, business process knowledge in total is a strong at 36.80%. This was a positive showing of business process knowledge. With an average of 11.50% each defining, designing, configuration, and testing phases were almost equivalent in knowledge of processes. Due to worker's participation within transactions and the process lifecycle, identifying and understanding what constitutes a process for establishing better process performance criterion for stability during normal operations or

disruption was made easier. Leader participation (executives 7.14% and senior management 5.65%) was close to the representative percentage of leaders in most US companies and there showing in this study was solid headcount that aligned with the business process lifecycle responses where 'strategy' experience (16.86%) was present which is important to business process performance stability. Realistically senior leaders are a small percentage of most company populations. According to the Bureau of Labor Statistics (2024), in 2023, management population was 29.75% and C-Suite executives made up 8.51% and general operations managers were 6.50% of this population (*Employed Persons by Detail*, 2024). Being that IT (37.76%) and Sales & Marketing (21.53%) had the most respondents, these are more than likely the departments or functional areas where individual contributors like specialists, analysts, generalists, partners, administrators, engineers, developers, architects, consultants, etc. and managers and senior managers made up 59.29% of respondents respectively were a part. Over half of the respondents fell in the 30 – 45 (58.70%) age range wherein 30-35 (26.55%) was the majority age range for participants. Overall, the business process performance impact was measured by workers with appropriate knowledge of business process strategy, identification (defining), design, configuration, testing, implementation/deployment and management.

5.2 Discussion

This study's purpose was to establish the relationship of internal controls (IC), top management mindfulness (TMM), organizational agility (OA), modularity (MOD) and knowledge absorptive capacity (KAC) respectively on BPP empirically through a quantitative methodology and explore its impact on business process performance. We

aimed to explain business process performance flux, interruption, or stalling and the inability of human resources to execute and manage processes through investigating specific factors and their impact on process performance. Our ambition was to answer the research question concerning the factors that affect business process performance for US enterprises during disruption. Additionally, the goal was to address the hypotheses posed that the relationship between internal controls (H1), top management mindfulness (H2), organizational agility (H3), modularity (H4), knowledge absorptive capacity (H5) and business process performance would become stronger when internal controls, top management mindfulness, organizational agility, modularity, and knowledge absorptive capacity increased. As presented in the results section, the main findings of the structural model mostly supported the conceptual model proposed. The statistical outcome for this research supports hypothesis H1 – H4 for the aforementioned factors proposed and how they positively and significantly affect business process performance. Surprisingly, H5 was unsupported.

Internal controls (H1) as a whole had the second strongest relationship with business process performance and there was good support across the elements of control activities, control environment, risk assessment, information & communication, and monitoring as measured by COSO's criterion. Utilizing an internal control framework designed to look at efficiency and effectiveness as proven by this study can definitely assess other performance types outside of financials. Based on the results, participants agreed on 11 out of the 17 items that measured internal controls with a path ending to performance resulting in a significant relationship. There was majority support for control activities, information & communications, risk assessment and monitoring. Control

environment items had support for influencing BP performance as it relates to 'commitment to integrity and ethical values' and results suggests that most of its items had shown collinearity with the 'top management mindfulness' construct.

Internal Controls is complex and contributes to business management, COSO internal controls framework, and process optimization theories because it ensures consistency, checks and balances, streamlines processes and reduces errors. Integrated Internal control systems benefits every US industry and company and increases their process performance and competitive advantage through its risk management activities. Process stability and resilience rests on the identification and mitigation of risks. From the study results, an increase in IC assures an organizations ability to adapt its processes to internal and external likelihoods which increases process performance. IC supports the resource-based view and posits that internal human resources and their capabilities are critical for checks and balances for regulatory reporting such as SOX. IC ensures roles and responsibilities are clearly defined and independent in business processes that concern financials but also holds in this research for process performance. Tangible and intangible resources are critical for process performance as well as competitive advantage.

Based on COSO (2013) framework, it could be inferred from the results that US businesses that integrate internal controls will increase their process performance when control environment, control activities, information and communication, risk assessment, and Monitoring is built within their infrastructure. Having a controlled Environment enforces integrity and ethical values which is an indication of a good environment (COSO, (2013); PwC (2019). 38.35% of respondents indicated that an environment that

demonstrated a commitment to integrity and ethical values will have a significant influence on business process performance. 41.49 % of respondents agreed that control activities have a strong impact on process performance. The data indicates that process control activities put in place by management ensures that authentic and reliable process information are carried out through workflows built on policies that establish what is expected and procedures that put policies in action. Additionally, control activities are established for the selection and development of general process activities to support the achievement of objectives. According to COSO (2013), selecting and developing controls activities to integrate contributes to the mitigation of risks for the achievement of performance objectives at acceptable levels. Also, the data suggests that information and communication elevate process performance. 39.52% of respondents agree that organizations should only use relevant, qualified information when obtained or generated to support internal process controls. Additionally, organizations should internally communicate information including objectives, stakeholder responsibilities for process controls to support functioning which is crucial for performance. The data identifies risk assessment as important to process performance. 39.72% of participants agree that organizations need to establish ways to identify risks for the achievement of objectives across the entity and ways to assess risks as a basis for determining how to manage risk or changes that could significantly impact controls, process performance and company resilience. Furthermore, US organizations with good internal controls specifies performance objectives with clarity to be able to identify and assess risks relating to those objectives. Lastly, the data shows a positive influence of monitoring on business process performance. 35.10% of respondents agree that monitoring by performing ongoing and/or

separate evaluations to ascertain whether controls are functioning are signs of good internal controls. Organizations who evaluate and communicate deficiencies in a timely manner to those parties responsible for taking corrective action, including senior management and the Board of Directors as appropriate have an effective and efficient internal control system in place. This demonstrates that there is clear separation of roles, process security measures, and corrective actions established to address performance weaknesses of business processes in the participating US companies.

The effectiveness of IC ensures there is transparency and accountability in the company and that managers act in their owner's best interests. IC help organizations achieve strategic alignment and improve overall performance. With IC in place, business process performance increases because IC ensures BP alignment with the strategic goals of the company. IC improves information quality and aids mindful leaders in timely and informed decision-making. IC is all about information accuracy and reliability which in turn supports management's mindful decision-making. The role of IC emphasizes its ability to continuously monitor and communicate whether process performance controls are present and successfully functioning and when ceased, it evaluates and communicates deficiencies in a timely manner to those parties responsible for taking corrective action. Ongoing process improvement is facilitated by IC's monitoring and feedback. According to PwC (2019) and COSO (2013), internal controls play a critical role in supporting continuous improvement initiatives.

Previous research (Tetteh, et al. (2022) supports this study's findings as a whole overall and expanded on the individual components' significance of the relationship between performance and internal controls with control activities, control environment,

and information and communication showing significance. This result supports the fact that internal controls, the inner functions, and workings of all companies which are based on policies and procedures set in place by governmental bodies and/or company leadership has to be well understood, built in the organization's infrastructure, and operating effectively. There is high reliability that this factor is excellent for increasing business process performance.

Results from this study indicate that 34.61% of respondents believe that business process performance is significantly dependent on the mindfulness of top management (H2). The data infers that executives who mindfully make sure the organization's strategic plan identifies value from transformations will significantly impact process performance. Additionally, data suggests that mindful leaders who inform their management teams about the value of technology options before any strategic transformation change decision is made and/or who accurately anticipate transformations that are relevant to the organization, will have a positive impact on process performance. Mindfulness promotes a favorable environment to innovations and continuous improvement for business process performance, process engineering or reengineering, etc. Chesbrough (2003) and Demming, (1986) discusses and advances the importance of fostering an innovative mindset and having cognitive openness and resilience. Mindfulness enhances organizational absorptive capacity and learning capabilities by improving individuals' ability to learn from and adapt to new information. It heightens the ability of an organization to recognize the value of new, external information, assimilate it, and apply the knowledge for commercial ends Cohen and Levinthal (1989).

Argyris and Schon (1978) argue that organizational learning is critical for adapting to change.

According to previous research on mindfulness and resource-based theory, internal resources can be a competitive advantage for organizations fostering mindfulness if they are valuable, rare, inimitable, and non-substitutable (Barney, 1991). From the results of this study, mindful leaders can be viewed as valuable, rare, inimitable, and non-substitutable (VRIN) resources that enhances individual and organizational capabilities, who contributes to improved business process performance. Again, it can be inferred that mindful leaders and their considerations and involvement with business process strategies will have a positive effect on business process performance. Mindfulness reduces stress and burnout, leading to more effective and efficient business processes (Brown & Ryan, 2003; Hulsheger et al., 2013). Mindfulness as an element of IC's control environment for effectiveness and efficiency makes mindful executives paramount for combatting process performance disruption. Top management mindfulness leads us to understand that leaders being thoughtful and open to innovation but at the same time vigilant and alert to his/her surroundings as important to maintaining increased process performance for business continuity. Mindfulness practices enhance individual cognitive and emotional resources, leading to better process performance (Barney, 1991). There is high reliability that this factor is exceptional for increasing business process performance.

Another elevated relationship with business process performance is that of organizational agility. Results from this study indicate that 34.69% of respondents agree that business process performance is significantly reliant on organizational agility (H3). It can be assumed that companies with high organizational agility who capitalize on the

scalability and skillsets of their workforce will increase business process performance and possibly gain or maintain competitive advantage. Barney (1991) emphasizes the importance of firm-specific resources and capabilities in achieving competitive advantage. Agility as a resource enhances the effectiveness of business processes by enabling swift adaptation and reconfiguration (Barney, 1991). According to respondents, businesses that have the ability to respond rapidly to customers' needs, adapt production/services provisions rapidly to demand fluctuation, or cope rapidly to suppliers have organizational agility. Organizational agility, as a dynamic capability, allows firms to adapt their business processes quickly to changes in the environment (Teece et al., 1997; Eisenhardt & Martin, 2000). Further, the data shows that organizations who rapidly implement decisions to face market changes and those who see market changes as an opportunity for rapid capitalization possess agility. Teece, Pisano, and Shuen (1997) argue that dynamic capabilities are essential for achieving and sustaining competitive advantage in rapidly changing markets. Other researchers have also proposed that organizational agility affects organizational performance where agility should be included in operations and projects (Turi et al., 2023) and organizational agility as an antecedent for performance (Al-Qarelleh & Atan, (2021). According to Turi et al. (2023) and the findings of this study's results, agility should be adopted as a norm and a philosophy in organizations to boost performance and productivity. There is high reliability that organizational agility is superb for increasing business process performance.

Based on the research results, 33.26% of participants somewhat agree that there is a positive relationship between modularity and process performance. An increase in

process modularity or design increases business process performance (H4). Modular designs reduce complexity in business processes because it separates them into manageable process flows which increases performance. According to respondents, they somewhat agree their organization can easily assess the performance of a business process independently of the performance of their other processes. They are near certain that their business processes have very well-defined interfaces with their other processes. The data from respondents show employees somewhat agree that there is no ambiguity in executing a business process. Lastly, respondents sort of agree that their organizations technologies, rules, and procedures of a business process are stable. Although not a firm 'agree', survey participants show some confidence in their organizations process modularity which the data show translates into positive impact on process performance.

Previous researchers have also proposed that modular design in processes improves process performance (Dumas et al. 2008; Tu et al.,2004). Process modularity increases performance when processes are loosely coupled or can be independent of other processes if necessary in normal or turbulent times. Process modularity strengthens performance if processes can be separated, but, easily reconfigured into new processes, which contributes to business process performance withstanding disruption. Studies highlight how modularity simplifies complex processes, making them more manageable and improving overall performance (Simon, 1962; Baldwin & Clark, 2000). Modularization makes troubleshooting, process management, and process optimization easier because it removes complexity and lack of complexity is crucial for effective operations. Studies indicate that modular processes enhance organizational agility and flexibility, allowing firms to respond rapidly to market changes and technological

advancements (Sanchez & Mahoney, 1996; Eisenhardt & Martin, 2000). Additionally, research shows that modularity helps organizations to use their resources more efficiently and effectively for sustained competitive advantage (Barney, 1991; Grant, 1996). There is high reliability that business process modularity is excellent for increasing business process performance.

The significant relationship between knowledge absorptive capacity and business process performance (H5) is notable from the results. 33.39% of respondents agree that organizations with employees who can link existing knowledge with new insights and who have employees who relate information beyond their organization's industry will positively impact process performance. Also, the data reflects organizations who support the development of prototypes, and/or who regularly adapts technologies in accordance with new knowledge or has the ability to work more effectively by adopting new technologies will heighten process performance.

Absorptive capacity enhances the firm's ability to utilize its knowledge resources effectively, leading to improved business process performance (Barney, 1991; Grant, 1996; Kogut & Zander, 1992; Zahra & George, 2002). High absorptive capacity suggests improvement of business processes and overall performance because KAC facilitates the acquisition, assimilation, transformation, and exploitation of knowledge of processes. Thus it was surprising that the findings did not confirm that knowledge assimilation and application increase process performance. Because according to Shahzad et. al (2020) and Tseng (2014), knowledge management and knowledge acquisition is a pivotal tool for employees to collaborate and ensure consistent improvement in all departments of the

organization to enhance performance. Based on study results, knowledge absorptive capacity is has a negative effect on business process performance.

5.3 Implications

5.3.1 Theoretical

Our study presents an empirical model that consists of the factors leading to higher business process performance. This study encourages scholars to specifically focus on internal controls, top management mindfulness, organizational agility, and modularity as a foundational element to business process performance. The findings that modularity increases process performance aligns with the resource-based view (RBV) and the internal controls framework. Understanding the impact of modularization on performance offers scholars an additional factor to consider when establishing process performance criterion. Modularity in business processes lines up with the resource-based view of the organization and, emphasizes that internal resources and capabilities are critical for achieving competitive advantage. By modularizing processes, organizations can better leverage their unique resources and capabilities to enhance performance. Barney's (1991) research shows that modularity aids organizations with utilizing their resources more efficiently and effectively which contributes to sustained competitive advantage.

The results from this study contributes to research on alternative performance indicators (i.e. internal controls, top management mindfulness, organizational agility, and business process modularity) and their operationalization with respect to evaluating the organization's work routines and extends the current understanding of those alternative factors and their effect on process performance which provides valuable insights for academia (Van Looy & Shafagatova, 2016). Such a view has been largely lacking.

Business process management theory promotes accountability and transparency within processes to ensure that roles and responsibilities are clear and actions are traceable. Moreover, scholars can use internal controls as an empirical tool to examine an organization's work routines on performance because IC establishes clear accountability through documentation and reporting mechanisms. BPM's transparency helps in tracking process performance and ensures that individuals are responsible for their actions, reinforcing internal controls framework and business process management's principles of clear governance and accountability.

This research extends the existing knowledge of organizational performance based primarily on financial performance by examining and evaluating a conceptual framework that incorporates internal control elements to assess business process performance. Internal controls align well with the principles of Business Continuity (BC), which focuses on ensuring that an organization can continue to operate during and after a disruption. A core aspect of Business Continuity ensures that business processes are reliable and can continue during disruptions. Internal control systems enhance the reliability of processes by establishing consistent procedures and controls that ensure processes are performed correctly. This reliability ensures that critical operations can continue smoothly even during disruptions, supporting BC's goal of maintaining process continuity. Business Continuity emphasizes identifying, assessing, and mitigating risks to critical business functions to ensure operational continuity. Internal control systems provide a framework for identifying and managing risks through continuous monitoring and control activities. This proactive approach to risk management aligns with business continuity principles by

helping to prevent disruptions and ensuring that potential issues are addressed before they impact operations.

We further extend the existing knowledge and literature by examining and evaluating the relationship of mindfulness on performance. The findings from this study provide support to literature, highlighting the cognitive abilities of leaders (mindfulness) being key factors for leaders to create an appropriate climate for business process transformation and business process performance criteria development. By promoting self-awareness and personal responsibility, mindfulness helps individuals take greater ownership of their roles and tasks within processes. This aligns with BPO's principle of clear accountability, ensuring that processes are managed effectively. The principle emphasizes clear ownership and accountability for processes to ensure responsibility for process performance. While this underlying logic is suggested in the literature on mindfulness and process performance, more insights are needed. Regardless of the recent attention from researchers, the links between mindfulness and performance have scarcely been studied (King & Haar, 2017).

The findings from this study provide support to literature, accenting the role of organizational agility and its impact on business process performance. Agility enables organizations to quickly adapt their end-to-end processes in response to changing customer needs and market conditions. This ability to rapidly adjust and optimize processes ensures that the organizations continue to deliver high value to customers, supporting the core objective of business process orientation (BPO). The business process orientation principle emphasizes managing business processes from end to end, ensuring that all activities contribute to delivering value to the customer. Process-orientation is a

matter of mastering a whole range of techniques and principles in order to improve business processes and organizational performance (Willaert et al., 2007). This theory's principles require processes to be flexible and adaptable to accommodate changes and uncertainties in the business environment and requires focus on managing and improving processes to enhance overall performance. Organizational agility directly supports this principle by enabling processes to be quickly reconfigured or scaled to meet new demands or challenges. The organizational flexibility supports internal control framework ensuring that the organization can maintain efficient and effective operations despite changing conditions.

By understanding the aforementioned theoretical implications, researchers can better appreciate the critical role of internal controls, top management mindfulness, organizational agility, and business process modularity in enhancing business process performance and overall organizational effectiveness. Leveraging the internal controls framework can guide the development of more effective control systems and support continuous improvement efforts. This study's results and insights can initiate dialogue for the development of strategies to cultivate mindfulness within the workforce enhancing communication and collaboration between management and workers for improved performance and competitiveness. These theoretical inferences can guide the development of strategies to cultivate organizational agility allowing academics to leverage organizational agility for improvement of business process performance and competitiveness. Internal controls strengthen an organizations ability to utilize knowledge effectively which can lead to improved process performance. The results assert that resources at all times need to be on value recognition alert for new information and laws

that could upend processes. Additionally, organizations can use business process orientation and management theoretical perspectives to guide the development of modular process strategies and support efforts to optimize organizational design and resource utilization.

5.3.2 Practical

The practical value of this research lays in its relevance for organizations wanting to determine factors affecting their organizational process performance. Our findings provide empirical insights into the initial development steps toward increased and stable business process performance. From a managerial perspective, the findings are significant as organizations need to focus on the constructs affecting process performance and the organization's strategy, approach, resources, and activities that will bring the necessary change needed for their business processes to achieve better business process performance. We provided an in-depth characterization of internal controls and key elements used to ultimately improve process performance. We provided insight into process modularization, organizational agility, and mindfulness and its impact on process performance.

Findings suggest that by incorporating internal controls organizations can have increased financial and process performance. Research has shown a direct correlation between strong internal controls and improved financial performance metrics (PwC, 2019). The significance of the relationship between IC and business process performance, (*when IC is integrated*) can affect how businesses design their business processes, implement processes, manage their processes, and establish and analyze process performance metrics. IC empowers employees by providing guidelines and expectations

leading productivity. Additionally, when IC provides a clear framework for roles and responsibilities, employee engagement is enhanced. With an IC system (ICS), businesses will be able to streamline their operation by reducing inefficiencies, preventing errors, and ensuring consistency improving its operational competence. This study empirically examined the COSO framework for internal controls and concluded that IC should be linked to the overall effectiveness and efficiency of process performance in corporations. A strong ICS reduces the risk of legal penalties and reputational damage when businesses meet compliance with relevant laws, regulations, and industry standards. Research has shown that IC leads to improved operational efficiency & effectiveness and reduced operational costs (COSO, 2013; PwC, 2019). Companies can properly align their processes using internal controls mechanisms via Sarbanes Oxley criteria. As supported in previous research, compliance with regulatory requirements is significantly enhanced by effective internal controls.

Study results indicate that top management's mindfulness and its relationship with business process performance can have an impact on organizational management and employee behavior. Mindfulness increases cognitive functions like clarity of thought and it regulates emotions. This aspect of mindfulness leads to better decision-making which in turn results in effectiveness and efficient business processes and establishment of performance indicators. Studies by Dane and Brummel (2014) and Reb, Narayanan, and Chaturvedi (2014) indicate that mindfulness improves decision-making by reducing cognitive biases and enhancing attention to detail. Previous research by Hulsheger et al. (2013) and Reb et al. (2014) indicate that mindfulness improves interpersonal

relationships and teamwork, contributing to smoother and more efficient business processes.

Practical implications of a significant relationship between organizational agility and business process performance impacts market responsiveness, employee productivity, operational efficiency, and business process orientation and management. Organizational agility allows businesses to respond to customer demands and market dynamics. Organizational agility improves the organization's ability to eliminate unnecessary steps and adjust processes and strategies in real-time which increases business process performance. Organizational agility supports a work environment that promotes mastery and purpose and this elevates employee engagement and productivity contributing positively to business processes and performance overall. Studies by McKinsey and other sources indicate that agile transformations lead to significant improvements in employee engagement and productivity, which directly impact business process efficiency (McKinsey, 2021; Van Looy and Shafagatova (2016); Turi et al. (2023)). Previous studies confirm that agile organizations are more innovative, which directly contributes to better business process performance (Shahul Hameed et al., 2022; Turi et al., 2023). Organizational agility has been proven to positively influence business process performance.

This study and earlier research show that you can increase business process performance by modularizing business processes. Through modularizing or isolating different components, businesses can improve their resource allocation. Modularity ensures that resources are used efficiently and effectively enhancing overall business process performance. Studies show that modularity supports better resource utilization

and process optimization, leading to improved business performance (Baldwin & Clark, 2000; Ulrich, 1995). Modularity allows organizations to adapt to internal and external changes by modifying, replacing, or integrating modules without disrupting an entire process. Prior research indicates that modular processes enhance organizational flexibility and adaptability, allowing firms to respond rapidly to market changes and technological advancements (Sanchez & Mahoney, 1996; Eisenhardt & Martin, 2000). A significant function of modularity is easily scaling processes up and down. The scalability allows organizations to adjust their operations for growth, market fluctuations, to meet changing environmental needs or demands. Modularity makes the workforce, processes, and resource allocation more efficient and effective increasing business process performance. Modularity improves cross-functional collaboration amongst departments and teams by clarifying roles and responsibilities within each module which improves process performance. Modularity is essential for effective business process management as well as process performance efficiency.

By understanding the above-mentioned practical implications, organizations can leverage internal controls to enhance business process performance, leading to more efficient, compliant, and resilient operations. Organizations can implement mindfulness training and practices to enhance business process performance, leading to improved decision-making, focus, adaptability, employee well-being, collaboration, and innovation. These practical inferences can allow managers to consider and leverage organizational agility for improvement of business process performance, leading to more responsive, efficient, innovative, and resilient operations. Lastly, organizations can leverage business process modularity to enhance performance, flexibility, and innovation while managing

risks and optimizing resource allocation leading to better business process performance and overall organizational success.

5.4 Limitations & Future Considerations

Our study has several limitations that provide opportunities for further research. This study is limited to the extent that only US businesses participated because of the US SOX laws. Just as non-publicly traded companies uphold SOX and are not required, an understanding of businesses who may operate in other countries but subscribe to SOX 404 is unexplored. Further, when conducting a technical study of this importance, possibly selecting one or two targeted small or medium enterprises in a specific industry for an initial longitudinal approach would suffice for a deeper dive via industry. We encourage scholars to examine our findings in other contexts and to extend or modify them as appropriate. Additionally, the study could have been stronger if there was time allowed to repetitiously conduct informed pilots and subsequent drafts of the survey instrument items with time to uncover and determine the best indicators for constructs. I believe there are many more constructs to be added to the list of factors that impact process performance like environmental uncertainty, regulatory agencies, and many others.

Future research could focus on the individual dimensions of internal controls on business process performance with a mediating role of environmental uncertainty. Future studies could consider isolating cross-functional or matrixed working relationships to see a different perspective on process performance. Technically, workers can work for more than one company where they may achieve process experience from a different department from the other job which could in turn offer more perspective. Lastly,

consider a mixed research study to conduct interviews on performance and based on the results of the longitudinal study, conduct a quantitative study.

Although research shows that firms with higher absorptive capacity are better at integrating new knowledge into decision-making processes, leading to better strategic outcomes (Volberda, Foss, & Lyles, 2010; Cohen & Levinthal, 1990), (H5) was unsupported. Additionally, while studies indicate that absorptive capacity significantly boosts innovation by enabling organizations to incorporate external knowledge and ideas into their processes (Zahra & George, 2002; Lane, Koka, & Pathak, 2006), KAC had the opposite effect on process performance. Even though research suggests that absorptive capacity leads to more efficient use of resources by integrating external knowledge into internal processes (Lichtenthaler, 2009; Van den Bosch, Volberda, & de Boer, 1999), there was no support for (H5). Lastly, though studies demonstrate that absorptive capacity improves cross-functional collaboration, essential for effective business process management (Jansen, Van Den Bosch, & Volberda, 2005; Zahra & George, 2002), (H5) was unsupported. Unexpectedly from this study, KAC showed unsupported which was astonishing. However, if executed separately from the other independent variable results are significant with a strong path. KAC should definitely be explored when assessing the strength of business process performance. We suggest additional research for future studies.

5.5 Conclusion

This study investigated how business process performance was affected by internal controls, organizational agility, business process modularity, top management mindfulness, and knowledge absorptive capacity constructs respectively. The data found

that the previously mentioned factors had a significant, positive effect on process performance, except for knowledge absorptive capacity. The data suggested that hypothesis H1 -H4 were supported and confirmed the positive and significant relationship of the exogenous variables (IC, TMM, OA, and MOD) on business process performance. Based on the results from this research, when evaluating business process performance efficiency and effectiveness and its importance for continuous operations, four additional factors have been identified for an increase of performance. This study contributes and discloses an internal controls framework that can be used to initiate internal conversations between leaders and amongst departments and teams about the innerworkings of their functional areas, roles and responsibilities for process support, and important factors that may need to be addressed to maintain or increase business process performance. In order to determine business process performance, organizations need to identify those processes through functional discussions or working sessions before the next crisis. Additionally, the finding suggests usage of an internal controls framework to understand organizational processes based on procedures, policies, laws etc. for strategic process improvement initiatives. This study contributed four additional factors that increased business process performance. This research adds to extant literature focused on process performance and the additional factors that influence process performance.

The prerequisite to establishing performance measures is the discovering, defining, and documenting of processes. Only then, performance requirements on business processes can be specified by means of Process Performance Indicators (PPIs) with target values that must be reached in a certain period (Del-Rio-Ortega et al., (2010); (Tinnila, M. (1995). An important aspect in the business process management is the

lifecycle that includes the evaluation of business processes performance, since it helps organizations to define and measure progress towards their goals (Del-Rio-Ortega et al., 2010). After all critical processes have been identified and defined, ultimately, a process portfolio, for example, can consist of different delivery processes applied in the organization.

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APPENDICES

APPENDIX A: Construct Dictionary

CONSTRUCTS	*REFERENCES*
Business Process Modularity (MOD) *- the extent to which the production process is separated into standardized modules that can be easily re-sequenced into new processes that fulfill the requirements of producing new product features (Feitzinger and Lee, 1997).*	*(Feitzinger and Lee, 1997)*
Business Process Performance (BPP) *- Operational efficiency of inter- and intra-organizational processes which can measure the financial and non-financial flexibility, reliability, responsiveness and costs/assets of organizational and operational capabilities Kim, Gimun, Bongski Shin, and Varun Grover (2010); (Bernhard, Peter, Zoltan, & Maria-Luise (2006).*	*Kim, Gimun, Bongski Shin, and Varun Grover (2010); (Bernhard, Peter, Zoltan, & Maria-Luise (2006)*
Knowledge Absorptive Capacity (KAC) *- the ability of a firm to recognize the value of new, external information, assimilate it, and apply the knowledge for commercial ends Cohen and Levinthal (1989).*	*Cohen and Levinthal (1989)*
Organizational Agility (OA) *- An agile competitive environment is where the capability of a business to develop and utilize its knowledge base to gain a competitive advantage in a complex and volatile digital market according to Van Oosterhout et. al., 2006, which includes flexibility, learning, and responding efficiently and quickly to changes in the environment (Campanelli & Parreiras, 2015) wherein the people skills, knowledge and experience are the main differentiators between the companies (Goldman et. al., 1995).*	*Van Oosterhout, Waarts, & Van Hillegersberg, 2006); (Campanelli & Parreiras, 2015); (Goldman et al.,1995)*
The Committee of Sponsoring Organizations of the Treadway Commission (COSO 1992) Internal	*The Committee of Sponsoring Organizations of the Treadway Commission (COSO 1992 & 2013)*

Control (IC) *– internal controls is a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the following three categories: Effectiveness and efficiency of operations; Reliability of financial reporting; and Compliance with applicable laws and regulations.*	
Top Management Mindfulness (TMM) *– According to Sternberg (2000), leadership being open to innovation and vigilant but at the same time thoughtful and alert to his/her surroundings and evaluating all the factors of how they will maintain business continuity (Langer (1989).*	*Sternberg (2000); Langer (1989)*

APPENDIX B: Survey Instrument

Qualifying Questions

1 Do you presently work in any of the following functional areas or departments?

- o C-Suite
- o Human Resources
- o Finance
- o Information Technology
- o Procurement
- o Sales and Marketing
- o Legal
- o None of these

2 Have you worked in that function or department for 1 year?

- o Yes
- o No

3 Select the business process phases for which you are a part?

- ▢ Define (goal / purpose of process / why created)
- ▢ Strategize (plan your process and strategies (human-, document, or integration-centric) needed to achieve goals; assign stakeholders; set actions)
- ▢ Design (iteratively analyze and map your process; rules; policies; laws; governance; localizations; etc.)
- ▢ Configuration (iteratively model or build a proof of concept/prototype of process workflows and activities with stakeholders assigned in the process)
- ▢ Testing (iteratively test the process design and configuration proof of concept providing feedback until acceptable)
- ▢ Implementation/deployment (process is made live for larger organization)
- ▢ Process Management (support, monitoring results, troubleshooting, and optimizing process)
- ▢ None of the phases

4 Is your company in one of the US 50 states?

- o Yes
- o No

5 Has your company been in existence for three years?

- o Yes
- o No

Demographics

Demographic Questions

Demo1 - Which employee level below is closest to your existing organizational role?

- Executive (C-level roles, president, and executive vice president)
- Senior management (Senior vice president and vice president)
- Middle Manager (Associate vice president, senior director and director)
- Manager (Senior manager and manager)
- Individual contributor (Specialist, analyst, generalist, partner, administrator, engineer, developer, architect, consultant, etc.)
- None of the above

Demo2 - Write your Job Title below. (i.e. HR Director, IT Manager, Chief Legal Officer, Purchasing clerk, Consultant, HRIS specialist, etc.)

_____

Demo3 - What is your age group?

- 18 - 21
- 22 - 25
- 26 - 29
- 30 - 35
- 36 - 39
- 40 - 45
- 46 - 49
- 50 - 55
- 56 – 59
- 60 or Above

Demo4 - Gender Identity

- Male
- Female
- Other

Demo5 - What is the highest degree you have completed?

- High School Diploma
- Specialty / Technical Certificate
- Associate Degree
- Bachelor Degree

- Masters Degree
- Doctoral Degree

Demo6 - Employee Type

- Full Time
- Part Time
- Contractor

Demo7 - Select the number of employees at your company

- Under 500 (Small)
- 501-1,000 (Small)
- 1,001-2,500 (Medium)
- 2,501-5,000 (Medium)
- 5,001-7,500 (Medium)
- 7,501-10,000 (Large)
- 10,001-15,000 (Large)
- 15,001-20,000 (Large)
- 20,001–30,000 (Large)
- 30,001-40,000 (Large)
- 40,001-50,000 (Large)
- 50,001–100,000 (Large)
- 100,001-150,000 (Large)
- 150,001-200,000 (Large)
- More than 200,000 (Large)

Demo8 - What is the current status of your company?

- Publicly traded company
- Non-publicly traded company
- Foreign Private Issuer
- Not-for-profit organization
- Governmental organization
- Other

Demo9 - What industry classification does your company belong?
Select Industry

AGRICULTURE, FORESTRY, AND FISHING	Petroleum Refining and Related Industries ~	Security And Commodity Brokers, Dealers, Exchanges, And Services ~
Agricultural Production Crops ~	Primary Metal Industries ~	**SERVICES**
	Printing, Publishing, And Allied Industries ~	

Agriculture Production Livestock and Animal Specialties ~
Agricultural Services ~
Forestry ~
Fishing, Hunting, And Trapping ~
MINING
Metal Mining ~
Coal Mining ~
Oil And Gas Extraction ~
Mining And Quarrying of Nonmetallic Minerals, Except Fuels ~
CONSTRUCTION
Building Construction General Contractors and Operative Builders ~
Heavy Construction Other Than Building Construction Contractors ~
Construction Special Trade Contractors ~
MANUFACTURING
Apparel And Other Finished Products Made from Fabrics and Similar Materials ~
Chemicals And Allied Products ~
Electronic And Other Electrical Equipment and Components, Except Computer Equipment
Fabricated Metal Products, Except Machinery and Transportation Equipment ~
Food And Kindred Products ~
Furniture And Fixtures ~
Industrial And Commercial Machinery and Computer Equipment ~
Leather And Leather Products ~
Lumber And Wood Products, Except Furniture ~
Measuring, Analyzing, And Controlling Instruments; Photographic, Medical and Rubber And Miscellaneous Plastics Products ~
Stone, Clay, Glass, And Concrete Products ~
Textile Mill Products ~
Tobacco Products ~
Transportation Equipment ~
TRANSPORTATION, COMMUNICATIONS, ELECTRIC, GAS, AND SANITARY SERVICES
Communications ~
Electric, Gas, And Sanitary Services ~
Local And Suburban Transit and Interurban Highway Passenger Transportation ~
Motor Freight Transportation and Warehousing ~
Pipelines, Except Natural Gas ~
Railroad Transportation ~
Transportation Services ~
United States Postal Service ~
Water Transportation ~
WHOLESALE TRADE
Miscellaneous Retail ~
Wholesale Trade-durable Goods ~
Wholesale Trade-non-durable Goods ~
RETAIL TRADE
Apparel And Accessory Stores ~
Automotive Dealers and Gasoline Service Stations ~
Building Materials, Hardware, Garden Supply, And Mobile Home Dealers ~
Eating And Drinking Places ~
Food Stores ~
General Merchandise Stores ~
Home Furniture, Furnishings, And Equipment Stores ~
Finance, Insurance, And Real Estate
Depository Institutions ~
Holding And Other Investment Offices ~
Insurance Agents, Brokers, And Service ~ Amusement And Recreation Services ~
Automotive Repair, Services, And Parking ~
Business Services ~
Educational Services ~
Engineering, Accounting, Research, Management, And Related Services ~
Health Services ~
Hotels, Rooming Houses, Camps, And Other Lodging Places ~
Legal Services ~
Membership Organizations ~
Miscellaneous Repair Services ~
Miscellaneous Services ~
Motion Pictures ~
Museums, Art Galleries, And Botanical and Zoological Gardens ~
Personal Services ~
Private Households ~
Social Services ~
PUBLIC ADMINISTRATION
Non-classifiable Establishments ~
Administration Of Economic Programs ~
Administration Of Environmental Quality and Housing Programs ~
Administration Of Human Resource Programs ~
Executive, Legislative, And General Government, Except Finance ~
Justice, Public Order, And Safety ~
National Security and International Affairs

Optical Goods; Watches and Clocks ~ Miscellaneous Manufacturing Industries ~ Paper And Allied Products ~	Insurance Carriers ~ Non-depository Credit Institutions ~ Real Estate ~	Public Finance, Taxation, And Monetary Policy

Demo10 - What is the annual revenue of your company for the most recent fiscal year-end?

- Under $500,000
- $500,000 - $1 million
- More than $1 million but less than $10 million
- More than $10 million but less than $100 million
- More than $100 million but less than $500 million
- More than $500 million but less than $1 billion
- More than $1 billion but less than $5 billion
- More than $5 billion but less than $10 billion
- More than $10 billion
- Not sure

Demo11 - Demographic: Fundamental (ICFC)

LIKERT SCALE: Strongly Agree / Agree / Somewhat Agree / Neither Agree nor Disagree / Somewhat Disagree / Disagree / Strongly Disagree

For this section, look back over each of the internal control categories.

	CONSTRUCT	***ABREV.***	*ITEMS*
(Parveen P. Gupta, LLB, PH.D., 2009)	***Internal Controls:*** *Five Components*	***ICFC1***	*Prior to covid, our department formally utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage* ***enterprise risk and controls***
(Parveen P. Gupta, LLB, PH.D., 2009)	***Internal Controls:*** *Five Components*	***ICFC2***	*Prior to covid, our department formally utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage* ***business processes activities***
(Parveen P. Gupta, LLB, PH.D., 2009)	***Internal Controls:*** *Five Components*	***ICFC3***	*Prior to covid, our department formally utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage* ***Information and communication***

(Parveen P. Gupta, LLB, PH.D., 2009)	***Internal Controls:*** *Five Components*	***ICFC4***	*Prior to covid, our department formally utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage* ***control environment***
(Parveen P. Gupta, LLB, PH.D., 2009)	***Internal Controls:*** *Five Components*	***ICFC5***	*Prior to covid, our department formally utilized a framework (provided by government, professional services, IT/IS, etc.) to effectively manage* ***IT governance and general controls***

Instrument Items

Likert scale: Strongly Agree / Strongly Disagree

- Strongly Agree
- Agree
- Somewhat Agree
- Neither Agree nor Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Business Process Performance

For this section the term "**business process performance**" specifically refers to operational efficiency of inter- and intra-organizational processes.

	CONSTRUCT	*ABREV.*	*ITEMS*
(Aydiner et al., 2019)	***Business Process Performance***	***BPER2***	*Our products and/or services are differentiated from those of our competitors.*
(Aydiner et al., 2019)	***Business Process Performance***	***BPER3***	*Our customers' requests have been adequately responded.*
(Aydiner et al., 2019)	***Business Process Performance***	***BPER5***	*The percentage of utilization of tools and equipment has been improved.*
(Aydiner et al., 2019)	***Business Process Performance***	***BPER6***	*Market trends have been identified more quickly.*
(Aydiner et al., 2019)	***Business Process Performance***	***BPER9***	*Our company establishes close relationships with the customers.*

(Aydiner et al., 2019)	***Business Process Performance***	***BPER10***	*Our company maintains close relationships with the suppliers.*
Mahmood and Soon (1991); Elbashir et al. (2008), Bayraktar et al. (2009), Mclaren et al. (2011), Mithas et al. (2011), Luo et al. (2012); (Aydiner et al., 2019)	***Business Process Performance***	***BPER1***	*Our meetings and discussions have been held efficiently and effectively.*
	Business Process Performance	***BPER4***	*The productivity of labor has been improved.*
	Business Process Performance	***BPER7***	*Our firm is successful in gaining economies of scale.*
	Business Process Performance	***BPER8***	*Our company has rapid and effective internal and external coordination for its regional, national, and global activities.*

Business Process Modularity

For this section the term "**modularity**" specifically refers to the practice of standardizing business sub-processes so that they can be re-sequenced easily or new modules can be added quickly in response to changing requirements.

	CONSTRUCT	***ABREV.***	***ITEMS***
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD1*	*Changing this business process does not affect our other processes.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD2*	*It is very easy to detach this business process from our other processes.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD3*	*It is very easy to combine or recombine this business process with other processes.*

Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD4*	*We can easily assess the performance of this business process independent of the performance of our other processes.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD5*	*A business process has very well-defined interfaces with our other processes.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD6*	*The technologies, rules, and procedures of this business process are stable.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD7*	*There are many exceptions regarding the rules and procedures of this business process.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD8*	*Employees find no ambiguity in executing this business process.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD9*	*There is seldom any change to this business process.*
Tanriverdi, Huseyin, Prabhudev Konana, and Ling Ge (2007)	***Modularity***	*MOD10*	*Our managers are frequently involved in resolving process-related issues.*

Knowledge Absorptive Capacity

For this section the term "**knowledge absorptive capacity**" specifically refers to the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends.

	CONSTRUCT	*ABREV.*	*ITEMS*
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC1	The search for relevant information occurs daily in my company.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC2	There is a quick information flow in my company.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC3	New ideas and concepts are created via cross-departmental communication in my company.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC4	The employees of my company have the ability to structure and use collected knowledge.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC5	The employees of my company can link existing knowledge with new insights.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC6	The employees of my company are able to transform new knowledge into productivity
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC7	My company motivates the employees to use information sources within my industry.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC8	My company expects employees to be related to information beyond my industry.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC9	My company emphasizes cross-departmental support to solve problems.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC10	My company exchanges ideas through periodic meetings.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC11	My company supports the development of prototypes.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC12	My company regularly adapts technologies in accordance with new knowledge.
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Knowledge Absorptive Capacity***	KAC13	My company has the ability to work more effectively by adopting new technologies.

Organizational Agility

For this section the term "**organizational agility**" (OA) specifically refers to the capability of a business to develop and utilize its knowledge base to gain a competitive advantage in a complex and volatile digital market including flexibility, learning, and responding efficiently and quickly to changes in the environment.

Agile organizations must strive to create an equilibrium between the apparently conflicting processes of stability and flexibility to survive and grow in response to the technological changes and environmental uncertainty because flexibility without stability can result in chaos.

	CONSTRUCT	***ABREV.***	***ITEMS***
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Organizational Agility***	OA1	We have the ability to respond rapidly to customers' needs
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Organizational Agility***	OA2	We have the ability to adapt our production/service provision rapidly to demand fluctuations
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Organizational Agility***	OA3	We have the ability to cope rapidly with problems from suppliers
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Organizational Agility***	OA4	We rapidly implement decisions to face market changes
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Organizational Agility***	OA5	We continuously search for forms to reinvent or redesign our organization
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Organizational Agility***	0A6	We see market changes as opportunities for rapid capitalization

Top Management Mindfulness

For this section the term "**top management mindfulness**" specifically refers to a person who is open to innovation and vigilant but at the same time thoughtful and alert to his/her surroundings.

	CONSTRUCT	***ABREV.***	***ITEMS***
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Top Management Mindfulness***	*TMM1*	*Top management accurately anticipates digital transformation that is relevant to our organization*
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Top Management Mindfulness***	*TMM2*	*Top management informs our organization's management team about the value of different digital technology options before any strategic digital transformation change decision is made*
(Bhatti, Santoro, Khan, and Rizzato et al., 2020)	***Top Management Mindfulness***	*TMM3*	*Top management makes sure that the firm's strategic plan identifies value from digital transformation*

Internal Controls

Control Environment (ICCE)

*For this section, as stated by COSO (1992) an operative "**control environment**" is an environment where qualified people understand their roles and obligations, limits to their authority and are knowledgeable, mindful, and committed to doing what is right and doing it the right way. They are committed to following an organization's policies and procedures and its ethical and behavioral standards. They further noted that control environment has an impact on the extent to which individuals recognize what they will be held answerable (Whittington & Pany 2009).*

	CONSTRUCT	***ABREV.***	***ITEMS***
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Environment Perceptions*	***ICCEP1***	*The Board of Directors demonstrates independence from management and exercises oversight of the development and performance of internal control.*

(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Environment Perceptions*	***ICCEP2***	*Management establishes, with board oversight, structures, reporting lines, and appropriate authorities and responsibilities in the pursuit of objectives*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Environment Perceptions*	***ICCEP3***	*The separation of duties and responsibilities of workers is clear.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Environment Perceptions*	***ICCEP4***	*A job description at all levels has been done.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Environment Perceptions*	***ICCEP5***	*The organization demonstrates a commitment to integrity and ethical values.*

Risk Assessment (ICRA)

*For this section, as stated by COSO (1992) "**risk assessment**" is the identification and analysis of relevant risks to achievement of the objectives, forming a basis for determining how the risks should be managed. Mechanisms should be placed to identify and deal with risk since economic, industry, regulatory and operating conditions will continue to change. In other words, risk assessment is the process of identifying and analyzing risks to achieving a company's goals, analyzing events that may occur, considering the possibility of it happening and the impact on achieving its objectives, and deciding how to react to the risks (Office of Financial Management, 2015). Managers set goals and objectives at levels that align with the company's mission and vision. (Office of Financial Management, 2015).*

	CONSTRUCT	***ABREV.***	***ITEMS***
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Risk Assessment*	***ICRA1***	*The organization specifies objectives with sufficient clarity to enable the identification and assessment of risks relating to objectives.*

(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Risk Assessment*	***ICRA2***	*The organization identifies risks to the achievement of its objectives across the entity and analyzes risks as a basis for determining how the risks should be managed.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Risk Assessment*	***ICRA3***	*The organization considers the potential for fraud in assessing risks to the achievement of objectives.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Risk Assessment*	***ICRA4***	*The organization identifies and assesses changes that could significantly impact the system of internal control.*

Control Activities (ICCA)

*For this section, **"Control Activities"** are policies and procedures established and executed to ensure that actions identified by management are necessary to mitigate risks. Control activities are the policies and procedures that help ensure that the management directives are carried properly and in a timely manner. Necessary actions are taken to manage, reduce and to address risks towards the achievement of the entity's objectives (COSO, 1992). Additionally, control activities are performed at all levels of the entity, at various stages within business processes, and over the technology environment" (Romney & Steinbart, 2009).*

	CONSTRUCT	***ABREV.***	*ITEMS*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Activities*	***ICCA1***	*The organization selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Activities*	***ICCA2***	*The organization selects and develops general activities over technology to support the achievement of objectives.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Control Activities*	***ICCA3***	*The organization develops control activities through policies that establish what is expected and procedures that put policies in action.*

Information and Communication (ICIC)

*For this section, the "**Information and Communication**" component are systems or processes that identify, capture, and exchange information in a form that enables people to carry out their responsibilities and roles. Information can be identified, captured, and exchanged within the company and with external parties. Information communicated should be timely, accurate and reliable (COSO, 1992).*

	CONSTRUCT	***ABREV.***	*ITEMS*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Information and Communication*	***ICIC1***	*The organization obtains or generates and uses relevant, qualified information to support the functioning of internal control.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Information and Communication*	***ICIC2***	*The organization internally communicates information, including objectives and responsibilities for internal control, necessary to support the functioning of internal control.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Information and Communication*	***ICIC3***	*The organization communicates with external parties regarding matters affecting the functioning of internal control.*

Monitoring (ICM)

*For this section, as stated by COSO (1992) "**monitoring**" of controls is one of the components of internal control that assess the quality of internal control performance over time. It is necessary to monitor internal control to know whether it is functioning as expected and whether changes are needed. Monitoring can be achieved by ongoing activities such as supervising regularly (Whittington & Pany, 2009).*

	CONSTRUCT	***ABREV.***	*ITEMS*

(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Monitoring*	***ICM1***	*The organization selects, develops, and performs ongoing and/or separate evaluations to ascertain whether the components of internal control are present and functioning.*
(Andreas G. Koutoupis, Evangelia Pappa, 2018)	***Internal Controls:*** *Monitoring*	***ICM2***	*The organization evaluates and communicates internal control deficiencies in a timely manner to those parties responsible for taking corrective action, including senior management and the Board of Directors, as appropriate.*

VITA

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