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Abstract

In the United States, more than half of the failures of software development projects in the mobile applications domain are caused by inadequate tacit knowledge sharing. Challenges associated with implicit knowledge transfer among individuals pose problems in establishing personal and organizational knowledge capture strategies. This quantitative correlation study aimed to develop structural mechanisms based on corporate culture and social exchange factors that predict organizations' ability to capture developers' tacit knowledge. This quantitative investigation examined the organizational reward policy, affective organizational commitment, and organizational regulation compliance affect the prediction of the tacit knowledge capture in the mobile applications development domain based on programmers' stratification. The study also evaluated how the programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category. A quantitative non-experimental was used in this study using a closed-ended questionnaire researchers used accessible online to collect the research data. The population of this study included mobile application developers working in software development and participating or influenced by implicit knowledge-hiding behavior in the United States. The Qualtrics survey tool was used, and a sample of 179 randomly selected participants were utilized in the analysis. The proposed model was assessed utilizing structural equation modeling techniques and IBM-SPSS AMOS tools.

The findings suggest that reward policy and regulation compliance significantly affect tacit knowledge capture in mobile application development. In addition, it indicates that a programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category. In contrast, an affective commitment was not a significant predictor of tacit knowledge capturing. Together, the research constructs explained 66% of the

variance of the dependent variable. It is recommended for policymakers establish guidelines regarding software development process documentation and review their reward policies. It would be valuable to expand the theoretical research model to test the influence of other determinants, such as continuance and normative commitment, in future research. Further, qualitative research approaches would be utilized to improve the model and better understand what influences programmers' positive and negative perceptions of tacit knowledge sharing and capturing.

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Chapter 1: Introduction

Regardless of size or specialization, organizations are in high need of establishing precise knowledge management processes. Tacit Knowledge sharing (TKS) is an essential component of managing knowledge. Unlike explicit knowledge, tacit knowledge is experience-based knowledge that resides inside individuals' brains. Therefore, it does not take standard document formats such as printed or electronic media (Jamshidi et al., 2018).

Evidence shows that software development organizations' leaders must encourage tacit knowledge-sharing behavior to enhance the overall performance of businesses (Woodfield et al., 2020; Amber et al., 2019). However, several researchers argued that the TKS's current levels in the industry do not indicate that organizations are reaching their goals regarding promoting TKS behavior among employees (Amber et al., 2019; Pham, 2015). Furthermore, the employees' shared tacit knowledge helps enhance outcomes in learning, solving work-related problems, sharing expertise, and supporting innovation (Buunk et al., 2019).

Therefore, organizations must achieve due diligence to promote the tacit knowledge-sharing behavior among employees to advance organizations' overall performance. In addition, sharing knowledge is aspect employees do voluntarily without force by organizations' roles and regulations. In the workplace, sharing knowledge is considered an altruistic behavior that aims to help others without financial compensation or any other form of job reward (Pham, 2015).

Accordingly, identifying and examining factors that influence capturing and sharing tacit knowledge actions in the workplace could help organizations acquire advanced management methods and enhance performance. Such processes require developing a better understanding of how tacit knowledge is captured. This research examines the influence of organizational culture and social exchange factors in tacit knowledge capturing.

Organizational culture and social exchange among individuals significantly influence how individuals interact and think, understand how knowledge is captured and created, and disseminate knowledge (Matshwane et al., 2019). The organizational knowledge management process is significantly affected by the culture exited in the organization's works and practices (Lehman, 2017). Corporate culture established in the workplace determines the success and failure of knowledge sharing. Further, Graça (2020) claimed that workplace organizational culture could inhibit or facilitate knowledge sharing. This study leveraged its theoretical framework's corporate culture and social exchange theories. The independent variables of administrative reward policy, employee affective commitment, regulatory compliance, programmer's category, and programmer's years of experience are employed as predictors for the tacit knowledge capture.

Background

Tacit knowledge sharing among mobile application developers faces several barriers that prevent it from reaching an optimal level. Behnke (2010) indicated that developers only seem to release their tacit knowledge to achieve personal gains. Behnke (2010) also suggested that losing the crucial opportunity of sharing knowledge is an obvious situation. The issue is considered a severe problem in organizations, hindering managers' efforts to redefine corporate knowledge management culture.

Furthermore, Borrego et al. considered that architectural knowledge is sharing expression among global software development teams adopting agile methodology. Therefore, Borrego et al. also focused on utilizing implicit and explicit knowledge in international software development teams that use the agile approach. On the other hand, Chen et al. (2019) explored how individuals among software development teams acquire and manage tacit knowledge.

However, the sharing processes face several challenges that contribute to project failures. Maintaining better tacit knowledge sharing among team members contributes to software development success and innovations and enhances overall organizational performance (Jamshidi et al., 2018). Mtsweni and Maveterra (2018) addressed challenges facing tacit knowledge, resulting in a knowledge imbalance leading to failure in software development projects. Additionally, Mtsweni and Maveterra claimed knowledge management is a process in which knowledge is preserved for future use for the software development team's general benefit.

Mtsweni and Maveterra (2019) identified five human-centered soft issues that influence knowledge sharing among software development individuals. Those issues are lack of verbal communication, relationships, personality, critical thinking, and human orientation. Addressing tacit knowledge sharing is crucial for researchers and practitioners to advance overall performance. Establishing a corporate culture that encourages sharing tacit knowledge forms a positive environment for knowledge capturing (Graça, 2020; Matshwane et al., 2019).

Statement of the Problem

The problem to be addressed in this research is the failure of up to 60% of software development projects in the mobile applications domain caused by an inadequate level of tacit knowledge sharing, according to Adetunji (2018) and Mtsweni and Maveterra (2018) studies. Tacit knowledge is embedded in people's memories through experience or "know-how" (Nonaka & Takeuchi, 1995, as cited in Metin, 2019). The imbalanced capture of tacit knowledge sharing leads to poor service delivery and overall organizational performance (Bonomi et al., 2020; Mtsweni & Maveterra, 2019).

In addition, challenges associated with tacit knowledge transfer among individuals pose a problem in establishing personal and organizational strategies (Buunk et al., 2019). It is imperative to understand the implicit knowledge-sharing corporate environment effectively. Buunk et al. (2019) added that examining various circumstances within which the tacit knowledge is transferred is crucial.

Poor tacit knowledge sharing affects nearly 60% of mobile application development corporate performance, a critical challenge (Amber et al., 2019; Henttonen et al., 2016; Moreno et al., 2018). Amber et al. (2019) stated that knowledge hoarding negatively impacts individual and organizational strategies. Furthermore, Fernie et al. (2003) argued that the tacit knowledge retained by individuals represents methodological issues for those who believe in harnessing its utility in return for competitive advantages.

The current body of knowledge does not sufficiently address managing knowledge-sharing processes from theoretical perspectives of organizational culture and social exchange. For example, Caballero-Anthony et al. (2021) showed that corporate culture significantly influences the tacit knowledge behavior in the organization in implementing knowledge-sharing behavior. Further, knowledge-based organizational culture and management positively impact knowledge creation (Stojanović-Aleksić et al., 2019). However, unless administrative decision-makers understand organizational culture factors that influence employees to share their implied knowledge, organizations cannot obtain the knowledge sharing's full benefits (Metin, 2019; Woodfield & Husted, 2017).

Purpose of the Study

According to Mtsweni and Mavetera (2019), in the mobile applications development domain, 60% of projects fail due to poor tacit knowledge sharing. In response to this problem,

this quantitative correlation study aims to establish structural mechanisms based on organizational culture and social exchange factors that predict organizations' ability to capture developers' tacit knowledge. The targeted developers' knowledge-sharing behavior was addressed based on their stratifications within their organizations as programmers. Furthermore, developing a theoretical model for identifying factors that influence tacit knowledge capturing could help software development organization leaders more accurately enhance the implicit knowledge-sharing level and maximize its benefits. Three organizational culture management theories' constructs as independent variables predict tacit knowledge sharing as a dependent variable. The independent variables are administrative reward policy, affective commitment, regulation compliance, developer years of experience, and developer stratification. These independent variables were measured utilizing a Likert-scale seven-point scale items survey designed and validated in previous studies (Dyck & Wiebe, 2012; Martin, 2018; Prato et al., 2019; Van Hise, 2017). The tacit knowledge capture dependent variable was measured utilizing instrument items previously validated and used to measure the knowledge management success model (Halawi, 2005, as cited in Slavinsky, 2016). Halawi (2005) showed that the model is established on the widely recognized DeLone and McLean information system success model. Halawi added that DeLone and McLean's model includes knowledge and information quality, perceived benefits, system quality, user satisfaction, and intent to use. This study addresses implicit knowledge sharing among mobile application developers by examining factors that capture that knowledge. The issue is addressed through the theoretical lenses of the organization culture theory and social exchange theory. The targeted population is mobile application software development with different stratification layers. Previously validated survey measuring instrument components were employed to collect the data for this research.

Introduction to the Theoretical Framework

In this quantitative research, a correlational methodology was employed to examine the relationships among the variables. The research adopted a predictive study using survey methodology to gather data and establish a model for factors influencing tacit knowledge capture in mobile application software development. Mertens and McLaughlin (2004) argued that one primary advantage of the correlational approach is that several variables can be encompassed in the research.

The independent variables of organizational reward policy, employee affective commitment, regulatory compliance, programmer's category, and programmer's years of experience are employed as predictors for the tacit knowledge capture. Furthermore, this correlational approach examines the predictive relationship values of the tacit knowledge capturing and the five predictors. Additionally, the programmer's years of experience were explored as a moderator for the relationship between the programmer category and unstated knowledge variables. The independent variables in this study are strongly related to corporate cultures and social exchange theories. Several studies addressed this research-based organizational culture and theoretical management framework (Dyck & Wiebe, 2012; Martin, 2018; Prato et al., 2019; Van Hise, 2017).

This study leveraged its theoretical framework based on organizational culture and social exchange theories. Furthermore, the two theories are crucial determinants of effective knowledge transfer (Kislov et al., 2019; Power & Cormican, 2015). Therefore, evaluating the theoretical approaches and assessing resources and temporal constraints yielded both theories as the most suitable framework for this type of research (Kovacic, 2019; Power & Cormican, 2015).

Introduction to Research Methodology and Design

Survey Methodology

In this research, a survey method was utilized to collect research data. A survey is a reliable approach in quantitative studies because it has a high external validity (Coppola, 2014; Nielsen & Knardahl, 2016). The survey's internal authenticity is addressed by utilizing previously validated survey components applicable to the current research. Furthermore, previously validated survey items are extensively used in related studies' reviewed literature (Dodd et al., 2021; James et al., 2020).

Data collection and Population Sample Size

In this study, the potential population was mobile software development employees in the United States, both males, and females, with different age groups, employment levels, and employment years. Responders to the survey formed the participants' sample for this research. The G*Power calculator is utilized for calculating the research sample with a statistical power of 80% and 5% precision (Obi et al., 2018; Rocha Costa et al., 2018).

Survey responders formed the participants' sample for this research. An a-priori sample calculator for structural equation model analysis was used to calculate the minimum sample size required in this research. Several parameters were tested to calculate the sample size for the study. It has been found that with the desired statistical power level of 0.80 and an anticipated effect size of 0.3 (medium). In addition, there are five latent variables, 26 observed variables, and a probability level of 0.05. The minimum sample size for the SEM was 148 participants, and the recommended minimum sample size was 150 participants.

An effective and practical tool was used to collect data for this research. The Qualtrics software tool was utilized to obtain participants' consent and collect the data. After proper

approvals, emails distributed a web-based survey link to the research population. Leonardi et al. (2020) depicted that web-based surveys offer efficient data gathering.

Further, Maymone et al. (2018) argued that the advantages of the online survey methodology appeal to surveyors because of its fast data collection, swift analysis, and rapid development and administration. The Likert-scale seven-point scale items survey collects numeric data appropriate for the designated analysis techniques. Then, the proper analysis tool and method are selected based on the data's nature.

Participants Recruitment

The success of this research depended on adopting adequate approaches and procedures for approaching and selecting the participants. Screening research was conducted to determine companies specializing in developing mobile applications. Digital communications were used to contact targeted organizations directly. Dalessandro (2018) argued that digital technologies are successful tools in recruiting research participants in the United States.

Accordingly, selected companies were initially contacted by utilizing their organizations' websites. Decision-makers approvals to research those organizations' employees were acquired before distributing the research survey. The survey included an introduction to illustrate the participation consent, voluntary nature of the study, and satisfying background.

Analysis Tool and Technique

Several reviewed studies indicated that structural equation modeling (SEM) is a powerful technique that provides reliable research results (Sarstedt et al., 2020). The Social Package of Social Science (SPSS) and AMOS v.27 software meet the SEM capability requirement. More than one independent variable may have a significant predictive influence on the TKC variable. Accordingly, two additional statistical methods were utilized to enhance the analysis process.

The study design has been established to demonstrate the approach adopted by the quantitative methodology regarding the execution of the study goal and address the problem statement. Further, it considered aligning the study purpose and research questions and quantifying the relationships between criterion and predictor variables (Guay, 2014; Kovacic, 2019).

Research Questions

The primary research question addressed in this research was: what is the effect, if any, of organizational reward policy, affective organizational commitment, organizational regulation compliance, developer's category, and developer's years of experience on tacit knowledge capture in the software development industry? However, this research question can be understood as being comprised of five specific research questions:

RQ1

To what extent, if any, does the organizational reward policy affect the tacit knowledge capture in the mobile applications development domain?

RQ2

To what extent, if any, does the employee affective commitment affect the tacit knowledge capture in the mobile applications development domain?

RQ3

To what extent, if any, does organizational regulation compliance affect the tacit knowledge capture in the mobile applications development domain?

RQ4

To what extent does the programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category?

RQ5

To what extent, if any, does the programmer's category moderate the relationships between tacit knowledge capturing; and organizational reward, regulation compliance, and affective commitment predictors?

Hypotheses

$H1_0$

The organizational reward policy, alone or combined with other factors, does not significantly affect the tacit knowledge capture of the mobile applications development based on the programmer's category.

$H1_a$

The organizational reward policy, alone combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's knowledge.

$H2_0$

The employee affective commitment, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category.

$H2_a$

The employee affective organizational commitment, alone or combined with other factors, significantly affects the tacit knowledge capture in the mobile applications development based on the programmer's category.

$H3_0$

The organizational regulation compliance, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category.

$H3_a$

Organizational regulation compliance, alone or combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category.

$H4_0$

Programmers' years of experience do not moderate the relationships between tacit knowledge capturing and the programmer's category.

$H4_a$

A programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category.

$H5_0$

The programmer's category does not moderate the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

$H5_a$

Programmer's category moderates the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

Need for the Study

The need for this study was fourfold. First, positive and negative factors must be identified, clarified, and understood (Khoza & Pretorius, 2017). Then, the lack of a knowledge-

sharing platform is a critical issue and needs to be targeted (Noor & Rana, 2018). Further, more focus on implanting change readiness towards the knowledge-sharing process is critically needed (Rusly et al., 2014). Lastly, previous research suggested that organizations build an organizational culture that encourages knowledge-sharing practices (Park & Eun-Jee, 2015).

Relevance

The relevance of this study was threefold. One reason was this examination concerns professionals within the mobile software development industry. Future study findings identify the effects of the organizational culture images regarding reward policy, employee affective commitment, employee category, employee experience, and regulatory compliance regarding the TKS. Accordingly, the findings would help enhance performance in the workplace by promoting tacit knowledge capturing and sharing (Farooq et al., 2020; Filstad, Simeonova, & Visser, 2018).

In addition, the study's findings would guide organizations and individuals in the mobile software development domain concerned about improving organizations' performance by promoting employees' tacit knowledge-sharing behavior through the corporate culture approach (Amber et al., 2019). Furthermore, the theoretical research model established in this study can help knowledge-sharing aspects researchers and practitioners acquire knowledge regarding multiple factors affecting tacit knowledge capture and sharing (Buunk, Smith, & Hall, 2019; Khorakian, Mohammadi Shahroodi, Jahangir, & Nikkhah Farkhani, 2019).

Significance

The significance of the problem was fourfold. First, evidence indicates that knowledge sharing is a crucial component that plays an essential role in organizations' advancement (Ishrat & Rahman, 2019). Moreover, knowledge sharing and capturing is a cornerstone of an

organization's knowledge management process. It helps convey employee knowledge to an overall learning environment within the organizational culture (Amber et al., 2019).

Additionally, Moreno et al. (2018) argued that knowledge acquired by individuals needs to transfer to other employees for proper utilization, which positively influences organizations' performance. Finally, the KS is an essential factor in new knowledge creation, and without knowledge sharing, the knowledge creation process may not be dynamic (Camelo Ordaz et al., 2010; Moreno et al., 2018).

Definitions of Key Terms

Domain

The domain is an area of activities or knowledge that groups concepts perceived to be related (Zhao et al., 2021).

Explicit Knowledge

Explicit knowledge is readily articulated, codified, stored, and accessed; additionally, it can be expressed and shared in different formats (Kumar, 2021; Sumarto & Rumaningsih, 2021).

Implicit Knowledge

Also known as tacit knowledge, individuals possess knowledge due to personal experience that is most challenging to articulate (Gubbins & Dooley, 2021).

Knowledge Management

Knowledge management is creating, capturing, codifying, storing, sharing, distributing, and effectively utilizing the knowledge for the organization's benefit (Salvadorinho & Teixeira, 2021; Warner, 1990, as cited in Caballero-Anthony et al., 2021).

Mobile Applications

Mobile applications are computer software applications run on mobile computerized devices such as tablets and smartphones; they include three categories: native, web-based, and hybrid (Gunawardhana, 2021).

Organizational Culture

Organizational culture is the model of workplace values and behavior adopted and accepted by organizations entities and are utilized and foundations for the rules of conduct within the organization (Cram et al., 2017).

Social Exchange

Social exchange is an open-ended matter where the interest group involved in the exchange actions receives mutual benefits (Kamdar & Van Dyne, 2007).

Software Developer or Programmer

The programmer is the individual that develops computer applications or software utilizing particular programing instructions (Zaidan et al., 2020).

Summary

Inadequate tacit knowledge sharing among mobile application developers significantly affects overall success (Adetunji, 2018; Mtsweni & Maveterra, 2018; 2019). The failure to effectively address this issue may lead to more financial losses and wasted valuable experience-based knowledge (Amber et al., 2019; Buunk et al., 2019). Overall, this aspect would continue hindering organizations' mission to achieve service deliveries and innovations (Metin, 2019).

The knowledge capture approach is an important stage of overall knowledge management processes (Le Bellu, 2016; Wethyavivorn & Teerajetgul, 2020). Further, knowledge capture is needed to enhance mobile application software development sharing. In this research, the

problem was addressed through the lenses of organizational culture and social exchange theories. The study illustrated the predictive relationships between the tacit knowledge capture process and the five independent variables. Those variables are corporate reward policy, affective commitment, regulation compliance, programmers' stratifications, and years of experience.

The research built a theoretical model based on organizational culture and social exchange theories—Qualtrics software tool web-based survey instrument with validated data collected from randomly selected mobile application development organizations. The study sample was chosen randomly based on the established programmers' stratification layers. The research questions were answered based on statistical analysis using the structural equation model and multigroup analysis to test the established research hypotheses. The outcomes of this research could be employed to identify key characteristics associated with adequate knowledge capturing within the components of the corporate culture. Researchers and practitioners can utilize those results to promote knowledge sharing by enhancing how knowledge is captured.

Chapter 2: Literature Review

Failure to share developers' tacit knowledge in the mobile applications development field comprises a burden that leads to unsuccessful development projects. Mtsweni and Mavetera (2019) noted that 60% of mobile application development projects fail due to developers' poor knowledge sharing. Standish Group CHAOS's recent report indicated that success in mobile software projects is only 29%, and 19% fail outright globally (Shongwe, 2017)

Furthermore, evidence showed that failure to share knowledge among development team members significantly adversely affects overall organizational performance (Bonomi et al., 2020). According to Dogan and Dogan (2020), tacit knowledge-sharing accounts for 36.2% of executive innovation speed and 32.1% of innovation quality. Addressing the unspoken knowledge-sharing problem requires a deep understanding of factors influencing development organizations' ability to capture developers' tacit knowledge. This research addresses the implicit knowledge-sharing issue by establishing a knowledge-capturing mechanism.

This quantitative correlation study establishes a theoretical framework based on organizational culture and social exchange factors that predict organizations' ability to capture developers' tacit knowledge in response to the problem. Additionally, establishing a theoretical framework that enables leaders to identify factors influencing knowledge capturing helped address knowledge-sharing. Moorandian (2005, as cited in Chen et al., 2018) argued that most researchers and practitioners think valuable knowledge assets come from tacit knowledge.

Accordingly, this chapter discusses the theoretical framework utilized as lenses to address the problem. In addition to overviewing the current literature regarding the research top from different angles, that identifies gaps in the body of knowledge related to the issue being

addressed. Further, a summary was provided to highlight the alignment between the research problem, purpose statement, research questions, and hypotheses.

Method of Searching

Most of the literature reviewed and used in this research's components was limited to works published between 2016 and 2021. Various sources that provided fundamental background and insights in peer-reviewed articles are utilized. Those sources include textbooks, government publications, and regulatory entities. Deliberate search criteria were used to distinguish articles containing search keywords such as tacit knowledge sharing, organizational culture theory, organization, management theory, and *mobile software development*. The researcher utilized *ProQuest, IEEE Xplore, and EBSCOhost databases* offered by *Northcentral University online access* to collect source articles regarding the study.

The search criteria utilized Boolean operators (AND, OR, or NOT) to classify critical articles related to the study's concepts. The study concepts include mobile application development, software development, knowledge management, knowledge sharing, and tacit knowledge. The search criteria strategy included items such as ("tacit knowledge sharing" AND mobile applications), ("tacit knowledge sharing" AND benefits AND challenges), ("mobile application" AND development), and ("organizational culture theory" AND "organization and management theory").

The peer-reviewed articles for dates delimited between 2016 and 2021 were the search's knowledge inclusion criteria based on Northcentral online accesses. Further, the search returned about 700 articles on tacit knowledge sharing, over 1900 articles on knowledge management, over 400 articles on knowledge sharing obstacles and benefits, and 4844 articles on organizational culture theory and organization and management theory. An acquired search

process for each category varied according to relevance and within the five-year constraints starting in 2016. Two exclusion criteria were employed, including articles entirely written not in the English language and full-text articles that are not granted access through Northcentral University. Further, the search method in this study has been established and designed to provide recent literature about the problem identified in this research.

Theoretical Framework

In this research, the organizational culture theory (OCT) and social exchange theory (SET) are combined to examine factors influencing tacit knowledge-sharing behavior among individuals in the mobile software development field. Janićijević Nebojša (2015) described the organizational processes of structuring and shaping interpretivism and social interactions based on the SET. That shed light on how to understand and benefit from mechanisms of social interactions among employees. The OCT and SET influence factors that define the effectiveness of actions regarding organizational information (Yang & Chen, 2020; Zhang et al., 2018).

This section includes the historical background regarding the two selected theories that form the foundation of the theoretical framework of this research. Then, alternative theoretical frameworks were discussed. A description of how and why the nominated framework relates to this research is explained. Further, an explanation regarding how the framework has directed the formation of the problem statement, purpose statement, and research questions was provided.

The theories overviewed above have significant contributions from different angles to the aspect related to knowledge management in general. More specifically, the contributions of those theories are founded on the need to understand two crucial elements better. The first aspect concerns the vital role of organizational decision-makers in creating a health knowledge-sharing workplace environment. Then, the importance of factors positively influences the tacit

knowledge behavior among employees. These two roles are crucially essential and significantly contribute to efforts to help establish a healthy organizational knowledge-capturing environment.

In a healthy tacit knowledge-capturing environment, work-related knowledge and experiences are exchanged freely to benefit the entire organization to add more competitive advantages. Semerci (2019) argued that employees' differences in their personality traits, desires, needs, intentions, and work styles usually lead to conflict in the workplace. Organizational leaders establish healthy knowledge sharing and capturing by profoundly understanding their employees' personalities.

Organizational Culture Theory

Elliott Jaques introduced the concept of 'organizational culture' in 1951 (Lehman, 2017). The organizational culture concept refers to the extent to which employees are willing to share typical desires, aspirations, and commitments to work together (Evans & Smokowski, 2016; Hambrick & Wowak, 2021). Allaire and Firsirotu introduced the organizational culture theory in 1984 (Behruzi et al., 2013; Dwi et al., 2020). Additionally, the basis of the OCT is the notion that every workplace has its own work culture (Geertz, 1973, as cited in Evans & Smokowski, 2016).

Historically, Gu et al. (2012) argued that the OCT had been integrated with IT because it incorporates organization structure, project culture, organizational processes, and culture. The OCT highlights the importance of organizational components such as actions, perspective, and interpretations to understand better general behavior and change (Marin & Pereschica, 2017). Furthermore, Lehman (2017) opined that incorporating the OCT in the research administration domain highlighted challenges associated with knowledge management processes. Additionally, organizational culture theory encompasses combined levels of individuals and groups of phenomena (Dwi et al., 2020; Liu et al., 2021; Okudan et al., 2021). These articles addressed the

importance of aligning and incorporating the roles of organizational culture for the benefit of better knowledge management.

Further, Lehman (2017) argued that the local culture significantly influences the success of the entire organizational knowledge management process. The organization's culture greatly influences corporate knowledge management (KM) tools such as KM systems, processes, and KM initiatives that are entirely dependent on establishing a supportive KM culture (Mulder, 2013, as cited in Matshwane et al., 2019). Alike Iqbal et al. (2021) stated that OCT indicates that the employees' well-being influences project culture. The efforts above highlight the effective organizational culture strategies in establishing holistic KM processes.

Dwi et al. (2020) opined that organizational culture positively affects knowledge-sharing behavior and transformational leadership. Similarly, Lehman (2017) illustrated that establishing and sustaining a knowledge-sharing community must include corporate knowledge leaders that build metrics regarding knowledge management initiatives. According to (Matshwane et al., 2019), the OCT significantly influences the establishment of knowledge management systems.

Accordingly, the organizational culture theory was a useful theoretical tool with precision to explain part of the constructs included in this research. More specifically, the OCT has the required ability to demonstrate both organizational regulation compliance and affective commitment attitudes. The OCT addresses how administrative decision-makers could establish a culture that positively influences employees' intentions and behavior regarding sharing knowledge.

The organizational culture theory helped establish advanced knowledge management frameworks based on incorporating the role of the corporate culture. Dwi et al. (2020) illustrated that the holistic knowledge management process is positively influenced by tacit knowledge

sharing among software developers. Accordingly, the OCT explains two of the three independent variables considered in this research. The variables are employee regulation compliance behavior and affective commitment psychological attitude.

These two variables are strongly tied to the OCT because the theory highlights the importance of organizational components such as actions, perspective, and interpretations to understand better general behavior and change (Marin & Pereschica, 2017). The significance of the OCT in this research comes from its ability to explain the relationships between employees' affective commitment and compliance attitudes, like organizational culture and implicit knowledge-sharing behavior (Alzahrani et al., 2021; Dahlin et al., 2018). The OCT is incorporated in this research to examine the limitations of employees' psychological attitudes, such as compliances and commitments and the ability to share knowledge.

Social Exchange Theory

The Social Exchange Theory was introduced by Blau in 1964 and did not acquire much attention in knowledge management (Wang & Noe, 2010, as cited in Nguyen et al., 2020). Further, Malik et al. (221) argued that the Artificial Intelligence-social exchange theory (AI-MET) was introduced to extend the SET. The AI-MET claims that technology-mediated social exchange helps share knowledge of global talent management through artificial intelligence tools (Malik et al., 2021).

The SET has been built on the notion that both employer and employee may be dedicated to each other as an emotional means (Chernyak-Hai & Rabenu, 2018, as cited in Yang & Chen, 2020). Further, Itani et al. (2020) argued that, in addition to the theory's ability to explain the marketing relationship between customers and brands (Hollebeek, 2011, as cited in Itani et al., 2020). However, the SET in this research is incorporated to explain the relationships between the

employee and employer in the context of the organizational reward policies believed to motivate employees' implicit knowledge-sharing behavior.

The SET is a primary reference for establishing an individual's interests in the workplace (Arsawan et al., 2020). Additionally, the SET implies that incentive components positively impact knowledge-sharing practices (Alnaimi & Rjoub, 2021; Soral et al., 2022). Incentives significantly encourage people to share their knowledge (Kankanhalli et al., as cited in Rehman et al., 2021). Zhang et al. (2018) also utilized the SET as a theoretical foundation to study the moderating influence of transformational leadership on knowledge sharing as an antecedent of individual creativity. As shown in table 1, Blau (1989) pointed out three defining situations associated with the social exchange.

Table 1

Terms for Social Exchange Theory

Characterizing Conditions for Social Exchange Theory
A- Voluntary behaviors are expected to be reciprocated.
B- The method of reciprocations is undetermined.
C- Trust that the other party will reciprocate must exist.

Source: Blau, P. M. (1989). *Exchange and power in social life*

According to Thomas and Gupta's (2021) research, the SET is a crucial theoretical concept for understanding people's reactions. Furthermore, Nguyen et al. (2020) tested the direct and indirect structures to explain the influence of leader humility on knowledge-sharing intentions based on the theory of social exchange. Similarly, Sheikh et al. (2019) introduced a framework based on SET and learning theory that addressed the relationships between knowledge sharing, employee creativity, and servant leadership.

Organizational knowledge capture efforts depend primarily on an advanced understanding of factors influencing employees' behavior and intention to share knowledge. With its ability to explain people's reactions, and relationships related to employee-to-employee and employee-to-employer, the SET fits the required theoretical basis demanded in the research. Accordingly, the social exchange roles link and explain the organizational reward policies and employees' intention to share knowledge. Thus, that influences the organizational ability to capture valued tacit knowledge based on this research's proposed reward system.

The SET's importance in this research directly addresses the relationship between incentive and employee positive behavior. Rehman et al. (2021) illustrated those incentive procedures established by organizations positively impact knowledge-sharing behavior among employees. Organizational reward policy was one of the variables targeted in this research. The SET supports the plan to address the relationship between knowledge capture processes and rewards set by organizations to motivate employees to share their knowledge.

Study Theoretical Framework

A theoretical model was developed from organizational culture and social exchange theories to examine organizational factors that predict knowledge capture in the mobile application domain. In this study, the knowledge capture concept refers to organizations' abilities to collect and transform developers' tacit knowledge into explicit knowledge for the benefit of the entire organization.

Matshwane et al. (2019) illustrated how individuals think and behave, the foundation within which knowledge is created and captured, the change resistance, and ultimately how organizational knowledge is disseminated. Reviewed literature in this field revealed connections between knowledge sharing and corporate culture. According to Azeem et al. (2021),

organizational culture, knowledge sharing, and innovation positively influence competitive advantages.

Furthermore, Wilczewski et al. (2019) claimed that successful organizational collaborations necessitate creating new tacit knowledge rooted in the corporate culture and workplace behaviors. Similarly, effective knowledge sharing is contingent upon cooperation in the organizational culture at the workplace (Sveiby & Simons, 2002, as cited in Farahian & Parhamnia, 2021). According to Li et al. (2021), variations within the organizational culture negatively influence the moderating effect on individuals' cultural intelligence regarding knowledge sharing and sustainable innovation behaviors.

After careful analysis of the literature regarding knowledge capture and sharing, the model was founded to combine OCT and SET is more relevant for the research. That is, the OCT focuses on adoption, user behavior, and the organization's culture (Matshwane et al., 2019), and SET is the primary conceptual paradigm that utilizes the understanding of workplace behavior (Thomas & Gupta, 2021; van Tonder et al., 2020). Regardless of the successes achieved by the alternative theoretical frameworks discussed in this chapter, the combination of the OCT and SET established a precise theoretical foundation that could reach the purpose of this research.

Theoretical Model and Concepts

In this proposed theoretical model, the dependent variable was knowledge capture. In line with the root constructs, social exchange, and organizational culture-related behaviors, the knowledge capture represents the degree to which the organization could be expected to collect and transform employees' tacit knowledge into explicit knowledge. The knowledge capture was predicted to be influenced by organizational reward policy, affective commitment, regulation compliance, developers' category, and developers' years of experience. As shown in Figure 2.1,

these independent variables were established to predict knowledge capture. Based on the study's five hypotheses, the independent variable was anticipated to predict or moderate the relationships with the knowledge capture alone or combined with one or two other variables.

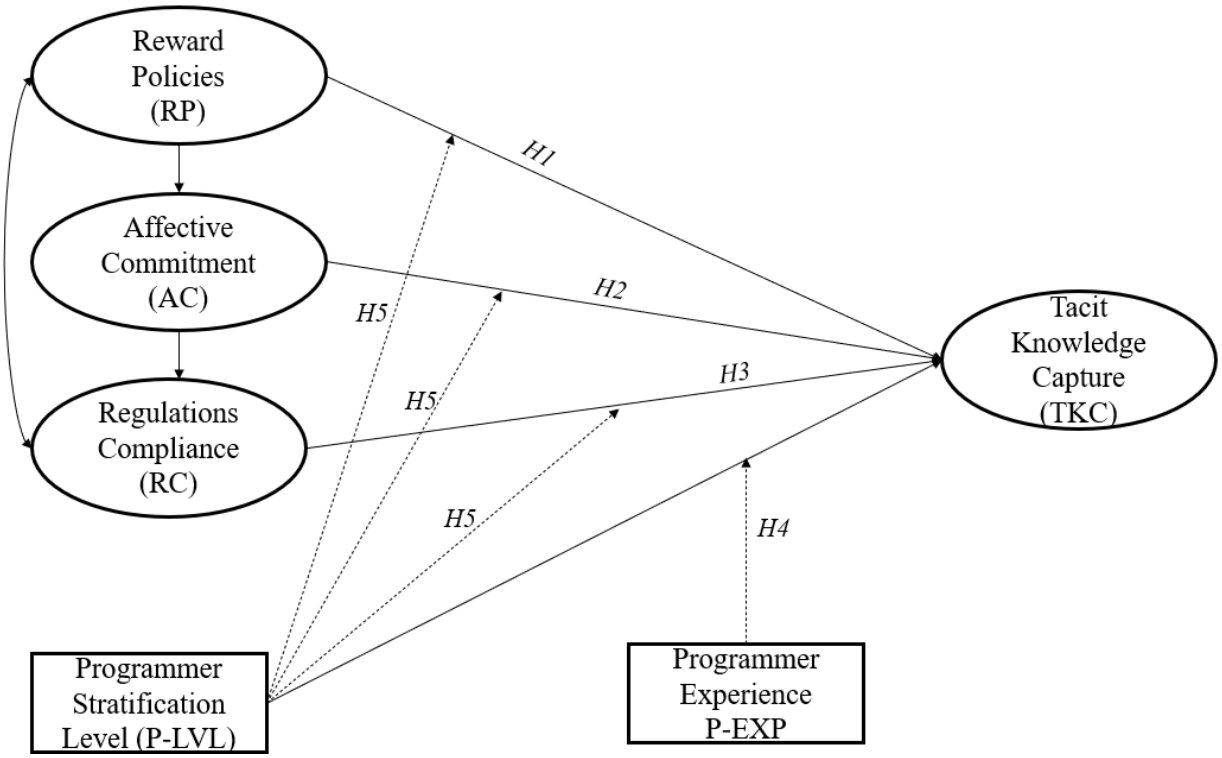

Figure 1. Study Theoretical Model

The theoretical framework illustrated above is a logical solution to the research problem. The problem to address this research is the negative influence of poor tacit knowledge sharing among mobile application developers, which fail up to 60% of development projects, according to Mtsweni and Maveterra's (2018) study. This study aimed to establish a mechanism that allows the prediction of organizational ability to capture software developers' tacit knowledge. This theoretical framework examined five independent variables as predictors or moderators of corporate knowledge capture. Addressing this problem would enable organizations to benefit from tacit knowledge sharing among developers.

Knowledge transfer refers to a collection of actions and processes to transform the know-how and experience-related tacit knowledge into a document form of direct experience for the organization's benefit. Khoza (2019) opined that knowledge capture is related to capturing, storing, and disseminating individuals' knowledge in addition to organizational artifacts collected and organized into the administrative systems.

The reviewed literature indicated that knowledge capture was one of the most central constructs in the organizational culture theory related to the knowledge management domain. Kumar (2016) concluded that knowledge culture plays a crucial role in knowledge management. Knowledge capture has been found to correlate with behaviors targeted with organizational culture policies and knowledge management practices (Balasubramanian et al., 2020; P. & Perwez, 2020; Silamut & Petsangsri, 2020).

These articles studied factors influencing knowledge capturing based on behaviors and the organization's culture. Further, knowledge capture and sharing improve employees' learning ability (Nengomasha et al., 2017). That indicates the contribution of generating more tacit knowledge through sharing and increasing other employees' learning abilities. Knowledge capture was the only independent variable considered in this research. The research aims to identify factors that predict organizational ability to precisely capture developers' tacit knowledge in the mobile application domain. The knowledge-capturing processing includes collecting and documenting tacit knowledge, considering sharing as the central knowledge source.

Organizational Reward Policy. Reward refers to different types of financial compensation established by an organization, such as pay, incentive, and promotions based on an employee's performance evaluation (Cho & Choi, 2021; Yin, 2018). Researchers widely use

social exchange theory to describe the employee-workplace relationship as a foundation for exchanging effort and loyalty for actual benefits and social rewards (Steers, 1977, as cited in Shropshire, 2008). Further, social exchange theory explains that employee job engagement is a crucial exchange value for benefits in certain forms. The outcome is proportional to the degree to which employees psychologically expect an organizational reward (Maurya & Agarwal, 2018; Rehman et al., 2021; Yin, 2018).

It is intuitive that when an employee and an organization adopt reciprocity norms in their relation, both parties could benefit from the reciprocated systematic treatment. Organizational rewards, job conditions, fairness, and supervisor support are antecedents of perceived corporate support (Eisenberger, 1990, as cited in Shropshire, 2008). Organizational rewards policies could predict employee performance (Helena Bulińska-Stangrecka & Anna Bagieńska, 2019; Rubel et al., 2021). Accordingly, knowledge sharing could be a criterion for employee performance evaluation processes.

The reviewed literature on organizational reward policies indicated the importance of establishing different administrative reward systems to encourage employees' sharing behavior. The literature stated the importance of reward policies as an exchange for better employee performance. More specifically, the literature indicated that a reward policy could be utilized as a criterion for establishing employee evaluation processes.

Organizational Affective Commitment. The existing literature illustrates that a considerable portion of exchange among employees and their organizations occurs in social exchange theory (Blau, 1989). Generally, the organizational commitment construct has been widely utilized in the literature concerning behavioral science. Organizations must establish mechanisms to satisfy their employees (Lau et al., 2017; Nam & Kim, 2016).

Reviewed literature indicated the existence of three components within the organizational commitment (Erdurmazlı, 2019; Faruk Kerem & Ertem, 2021; Saha & Kumar, 2018). Those three components are continuance, affective, and normative commitment. However, only affective commitment was considered a construct in this research.

Affective commitment has been at the center of behavior science research. Early research in the organizational commitment domain indicates that the predecessors of employee affective attachment to the organization are grouped into four types: work-related experience, personal, job, and structural characteristics (Eisenberger et al., 2006). However, work-related expertise has been noted as an element that fulfills employees' psychological demands to feel secure within the organization and capable regarding the work role (Allen & Meyer, 1990, as cited in Erdurmazli, 2019).

According to Allen and Meyer (1990), continuance commitment refers to the employee's projected cost of leaving the organization. Allen and Meyer also indicated that normative commitment refers to the organization's social, legal, or moral obligations (Meyer & Allen, 1991, as cited in Erdurmazli, 2019). Generally, the three organizational commitment components vary as independent and conceptual contents between employees (Valaei & Rezaei, 2016, as cited in Faruk Kerem & Ertem, 2021).

The above articles discussed the importance of employees' affective commitment from different perspectives. Articles related to affective commitment highlight the role of work-related experience in fulfilling the employees' psychological requirements to feel that their jobs are secured at the workplace. Job security refers to individuals' perception of a low probability of losing jobs, which contributes to job security's importance in enhancing employee-sharing behaviors. Knowledge hiding regularly occurs in the workplace (Babič et al., 2019). However, an

employee's affective commitment positively influences an employee's altruistic attitudes, such as legal and moral behaviors (Erdurmazli, 2019).

Organizational Regulation Compliance. Regulation compliance refers to the degree the employee adopts various guidelines established by the organization regarding how business activities must be achieved (Al-Izki & Weir, 2016; Kong et al., 2018). Reviewed literature supports the notion that cultural beliefs significantly influence behavior in the workplace. Hassan et al. (2017) opined that organizational culture is a primary dimension that guides decisions related to administrative policy enforcement.

Accordingly, organizational culture theory has been utilized in varieties of research to study administrative regulation compliances (Masrek, 2017; Page, 2017; Wang et al., 2018). Shiflett (2015) argued that organizational culture preferences strongly influence regulation adherence. Even though compliance forms an essential portion of organizational citizenship behavior theory, it is also one of the psychological attitudes that could be exploited by corporate culture (Shropshire, 2008).

These articles pointed to significant aspects of organizational regulation compliance, such as employee behavior, corporate guidelines, and adherence levels. Literature also linked the relationships between organizational culture and regulations compliance behavior. The current research goal was to deeply understand the relationship between the regulation's compliance psychological attitude and organizational ability to capture employees' tacit knowledge.

Programmers' Stratification. Generally, software programmers are ranked based on their employment role in the software development domain. The employment role was determined based on the knowledge acquired to perform job duties (Mirzoev et al., 2015). Mainly, employers have layers of programmers' stratifications ranging from junior to senior-

level manager programmers. The reviewed literature revealed that the theory of social exchange had been utilized to explain the programmers' knowledge-sharing behavior based on their ranking within their organizations (Haron et al., 2014; Obrenovic et al., 2020).

Knowledge acquisition and knowledge sharing levels are positively influenced by integrating technical and social aspects within the analysis of software development (Zhou et al., 2020). In this research, the programmers' stratification was examined in the context of its effects on behavior related to knowledge sharing. Programmers' stratification appears as classifying them into four categories. Those categories are junior, mid-level, senior, and manager-level programmers. The moderating effects of programmers' classes are examined in the relationships between implicit knowledge-capturing behavior and three independent variables.

Programmers' Years of Experience. The experience level acquired by a particular form has the potential for tacit knowledge capturing. However, Obrenovic et al. (2020) argued that individuals' willingness to share knowledge depends on the condition of reciprocity of exchanging knowledge with others. Furthermore, Zhang et al. (2021) opined that software development team members are selected based on their unique skills, experiences, expertise, and knowledge. That indicates the importance of social exchange theory in explaining the relationship between the individual level of knowledge gained about a task and the tendency to share that knowledge willingly.

In this research, the programmer's years of experience were targeted as a variable to measure its significant moderating effects on the relationship between programmers' categories and behaviors that lead to knowledge capturing. The literature linked the social exchange interaction among developers, the level of knowledge gained, and the duration spent acquiring

that experience (Mirzoev et al., 2015; Obrenovic et al., 2020; Zhang et al., 2021). This variable measured each responder's years in mobile software development.

Alternative Frameworks

Besides the theoretical framework selected for this research, other frameworks are discussed. Those frameworks were utilized successfully in similar studies concerning knowledge sharing and capturing from different perspectives. Additionally, those alternative frameworks have been successfully used in knowledge sharing and seizing other domains such as IT, the medical field, education, etc. (Iriarte-Ahón, 2020).

Self-determination Theory

In the early 1970s, the Self-determination theory (SDT) research developed from studies concerning distinguishing between intrinsic and extrinsic human motives. In the mid-1980s, the SDT was introduced and accepted following “Self-Determination and Intrinsic Motivation in Human Behavior,” written by Deci and Ryan in 1985 (Cockrell et al., 2018). In 1991, Ajzen supposed that individuals' intentions are factors that cause the motivations for behavior; that is, the stronger the one’s intention, the more likely the individual would accomplish the behavior. However, subsequent research revealed that intentions are not the only motivators for behaviors.

According to Gagne (2009), SDT established a multidimensional theoretical framework containing two types of motivation: autonomous and regulated (controlled) motivation. Independent (autonomous) motivation occurs when an individual engages in action volitionally out of enjoyment; the cause is intrinsic. Knowledge-sharing is a primary component of the knowledge-capturing process. Based on that, identifying knowledge-sharing motivations enhances better knowledge capturing. Considering the limitation of Ajzen’s assumptions that intentions are the only motivator for individual behavior, Gagné (2009) proposed a knowledge-

sharing prediction model based on combining SDT and the Theory of Planned Behavior. Gagné's (2009) model posited that motivation to share knowledge at the workplace would differentially influence personal decisions.

The SDT considers both the quality and the level of motivation for sharing knowledge. That highlights the importance of further investigating factors that influence employee sharing motivation. The significant contribution of the SDT to the knowledge-sharing issue is that it primarily considers the organizational reward system a powerful motivator. That is in addition to its prediction of other factors influencing knowledge sharing. However, the SDT is not used in this research because of its limitation regarding the dependence only on human intentions in explaining individuals' behaviors and motivations.

Social Capital Theory

The social capital theory (SCT) was based on the sociology domain in the 1980s and evolved in business and management during the late 1990s by Nahapiet and Ghoshal. The SCT links individuals' social networking relationships as a fuel for social capital where individuals' knowledge as capital could generate benefits. According to the SCT, relationships among social groups establish valuable social capital resources that enable positive behavior for mutual advantages among group members (Zhao et al., 2016). That implies the importance of strengthening social ties among individuals within an organization to enhance knowledge management processes. Further, Hau et al. (2016) opined that the SCT linked the employee's social capital 'relational-based resource' to the attituded towards sharing tacit knowledge.

In that context, social capital revolves around the idea that relationships with others grow economic capital gain or human capital in the form of knowledge. Organizations must enhance their knowledge management capabilities based on SCT-related organizational knowledge

creation and sharing views. Choi (2016) argued that trust, norms of faith, and organizational commitment are crucial relational capital that predicts an individual's knowledge-sharing behavior.

Besides that, Choi (2016) also claimed that cognitive dimension items such as information technology and training increase the relational social capital rate that affects the knowledge-sharing attitude. The SCT contributes to linking the social relationships and networks and the sharing behavior determinant role it plays in the organization. The factor is vital in defining the success of efforts targeting knowledge capture among mobile application development teams. However, the SCT is not considered a theoretical foundation because of its limitations, unlike the study's theoretical framework. That is, the SCT is based on the notion of social capital. Furthermore, the SCT notion does not explain constructs such as an individual's intentions for regulation compliance behavior.

The Theory of Planned Behavior

The theory of planned behavior (TPB) was initially established on the theory-based of reasoned action (TRA) foundations by attaching the perceived behavioral control variable to the TRA model. Ajzen introduced the TPB in 1991 as a theory to explain human social behavior. Based on the idea that human attitude, perceived norms, and perceived behavioral control are significant predictors of behavioral intentions (Stenius et al., 2017). These intentions are considered as the combined intention that predicts actual behavior. Primary beliefs drive those predictors about the consequences of an individual's behavior.

Based on the TPB, an individual's attitude regarding tacit knowledge sharing increases the intention toward that sharing behavior (Hau et al., 2016; Johnstone & Lindh, 2018; Kang & Kim, 2019). The TPB implies that individuals' perceived behavioral control influences people's

performance and affects their intention to perform that behavior. Samuel Oluranti and Hafsat Titilade (2018) argued that even with a favorable and positive attitude and subjective norms toward sharing, individuals may still have little intention to share tacit knowledge due to the absence of essential opportunities.

In summary, the TPB explains the factors influencing tacit knowledge-sharing behavior in the workplace. A better understanding of individuals' behavior, attitude, subject norm, and intentions can enable organizations to identify circumstances that negatively influence behavior toward sharing tacit knowledge. This research does not consider the TPB because it does not explain factors contributing to tacit knowledge from organizational knowledge management perspectives.

Social Learning Theory

Social learning theory (SLT) is concerned with learning processes and was introduced by Bandura in 1977. The SLT combines behavioral and cognitive learning theories to establish a more holistic explanation of human learning. Gürlek and Çemberci (2020) argued that the SLT underlines the crucial role of organizational leaders in establishing behavior patterns for all organization members. In this context, a knowledge-oriented leader can cause knowledge management processes more efficient.

The social learning theory contributes to learning in a social setting and helps explain factors that facilitate learning. Applying the SLT guidelines appears to have potential as an alternative theoretical framework. Knowledge is crucial to capturing knowledge, as understanding can help create more knowledge for individuals. On the other hand, this theoretical framework was not considered because it does not address the entire set of relationships considered in this research.

The Need for Tacit Knowledge Sharing

Tacit knowledge sharing (TKS) has been an advantage leading to organizational innovations. Dogan & Dogan's (2020) quantitatively assessed the relationships between knowledge sharing, innovation, and performance. Dogan & Dogan studied 150 high-tech software companies in three different Turkish cities. The study findings revealed that TKS positively influences the firm's overall performance and explicit knowledge, leading to a high level of innovation. Additionally, Dogan & Dogan claimed that TKS results in disseminating innovative concepts and its critical role in the organizational emergence of innovation.

Similarly, Jin-Feng et al. (2017) showed that KS and knowledge management (KM) became a critical requirements for enterprises to comprehend technological innovation and acquire competitive advantages in the knowledge economy era. However, although the two studies connected tacit knowledge sharing to organizational innovation, Jin-Feng et al. (2017) opined that the TKS is part of the knowledge management process. Supporting the role played by KM processes, Ganguly et al. (2019) concluded that tacit knowledge sharing and knowledge quality both positively influence innovation capability.

Another way the researchers and practitioners viewed the benefit of TKS is its contribution to improving the software development processes. Idrus and Ali (2019) argued that the effectiveness of software testing processes is contingent upon the accessibility of testers' tacit knowledge, which can reduce software testing mistakes. Idrus and Ali also claimed that sharing tacit knowledge among software testers significantly reduces testing process duration time and eliminates repeated errors. Similarly, efficient knowledge-sharing networks in agile software development continued to improve (Licorish and MacDonell, 2014, as cited in Ouriques et al., 2019).

Several studies looked at the TSK as an aspect that positively influences individuals' and teams' outcomes and enhances the development. Mtsweni and Maveterra (2018) claimed that organizations apply tacit knowledge to improve efficiency, effectiveness, and software development team outcomes. Implicit knowledge sharing aids developers and teams in enhancing project success by generating new knowledge creation (Yu et al., 2013, as cited in Khoza, 2019).

Additionally, Ahmad et al. (2018) argued that tacit knowledge sharing among employees contributes to overall employee performance compared to technology usage. Alike, Benfell (2021) illustrated that, without sharing tacit knowledge, the functional requirement quality would be low, which has implications for the software's design and coding. That implies that TKS is more beneficial to the developers than technology to acquire knowledge. These two articles uniquely viewed the importance of sharing developers' tacit knowledge instead of utilizing technology for learning. Jiang and Xu's (2020) study even argued that TKS influences the information technology (IT) research and development (R&D) team's performance.

The literature revealed that several researchers and practitioners considered the TKS aspect in human behavior influenced by different motivators. Iriarte-Ahón's (2020) study review of the literature concluded that sharing or hiding tacit knowledge behavior is an issue of individual motivation that significantly affects the collaboration between employees. Iriarte-Ahón added that acquiring a precise understanding of that motivation could assist organizations in enhancing their knowledge management process; and advance the internal and inter-organizational knowledge management processes.

Like Iriarte-Ahón's (2020) study that concentrated on understanding factors that influence knowledge-sharing behavior among individuals, Semerci (2019) introduced a different

approach to enhancing sharing behavior for the organization's benefit. Semerci (2019) argued that establishing a well-articulated and operative organizational knowledge-sharing platform can assist the organization in optimizing employees' knowledge-exchange behaviors.

The literature indicated the importance of establishing a clear organizational management view on acquiring the maximum possible benefits of the TKS. Bhattacharya and Sharma (2019) argued that healthy corporate knowledge management culture substantially decreases organization-wide knowledge-hiding behavior. However, Bhattacharya and Sharma pointed to crucial aspects that must be addressed based on the organizational knowledge management culture strategy. That impediment significantly affects knowledge sharing, including lack of trust, inadequate communication abilities, and time constraints (Cleveland & Ellis, 2015, as cited in Bhattacharya and Sharma, 2019). That indicated the need for a deep understanding of relationships among team members and enhancing management concerning the time assigned for projects to be completed.

Various research investigated the unique nature of tacit knowledge compared to explicit knowledge and its role in different approaches to understanding the benefits of TKS. For example, tacit knowledge is perceived as a valuable organizational asset because of its contextualist and experience nature Chen et al. (2018). Furthermore, Rumanti et al. (2016) argued that tacit knowledge is a potential asset that can be utilized to establish human resources, particularly within the internal organization. Rumanti et al. added that developers' tacit knowledge in small and medium enterprises is crucial in optimizing knowledge-sharing processes.

Researchers' different views of tacit knowledge sharing provided various perspectives regarding the unique benefits of TKS practices. Balle et al. (2018) assessed tacit knowledge (TK)

based on its help to mitigate the consequences of employee departures. Balle et al. also argued that TK IS critical to an organization's performance because it aids in distrusted organizational forms and fosters the capabilities to learn and adapt the behavioral style.

Kakar (2018) argued that software development includes converting individuals' knowledge from different specialization domains into collective expertise in a software product. However, knowledge sharing represents a significant process in achieving conversion. Alike, Yao et al.'s (2020) research illustrated that knowledge sharing includes multilayer processes that entail the accessibility of strategic knowledge. Accordingly, the unique nature of TK creation, formation, and dissemination.

The findings of the above studies are valuable evidence regarding the potential benefits that mobile application development organizations can gain. In that context, Khoza and Pretorius (2017) depicted that knowledge is a significant factor that enables organizations to maintain competitive advantages in the software development domain. Accordingly, it was illustrated that tacit knowledge sharing is a cornerstone for progress in modern software development. Similarly, Obrenovic et al. (2020) posed that knowledge sharing among individuals is crucial for knowledge-intensive entities to produce business values and capture a competitive edge.

Fuller's (2018) research advocated for the Cynefin framework to be widely utilized to assist decision-making processes in the knowledge management domain based on the need to benefit from TKS. According to Fuller, a Cynefin framework is a practical approach that allows shared understanding to emerge, strengthening how teams absorb development procedures, socialize, and collectively store insights. Additionally, Wang et al. (2016) argued that experts' collaboration from different disciplines in today's product design depends primarily on effective

workplace practice regarding creating, disseminating, and utilizing parties' knowledge. Wang et al. also added that team interaction and communication is essential

The findings of the above two research admired effective knowledge-sharing management among development team members. However, organizational leaders must consider paving the road for dynamic knowledge-sharing behavior to influence performance (Juan-Ru & Jin, 2017). Juan-Ru and Jin claimed that teammates could convey and conquer tacit knowledge through sharing behavior. Further, learning and integrating tacit knowledge can decrease work conflict and inspire solving methods. Accordingly, a healthy workplace environment is attainable by establishing healthy communication among team members.

Exploring the topic of implicit knowledge benefits revealed various findings that indicated the positive influence of those benefits on overall organizational performance and innovations. Most important is the role that implicit knowledge sharing plays in enhancing administrative knowledge management processes. Knowledge capture resides at the heart of knowledge management; therefore, understanding knowledge sharing aligns with efforts to increase software development projects' success rate in the mobile applications development field. A precise understanding of the TKS helps guide this research to address identified needs in organizational culture and social exchange theoretical bases.

Tacit Knowledge-Sharing Challenges

In an ideal situation, organizations can obtain the maximum benefits of TKS. However, several challenges face the process of knowledge sharing among the mobile application development team. Based on the reviewed literature, tacit knowledge-sharing challenges are pertinent and prevalent in the software application development industry. In this research, four

categories of challenges were analyzed. TKS challenges are related to tacit knowledge nature, development method, organizational culture and practices, and individual self-interest.

Tacit Knowledge Nature

Tacit knowledge is remarkable as it depends on several parameters associated with each and perceptions of life. At workplaces, tacit technical knowledge pertains to the know-how experience by individuals while practicing daily work. The degree to which that knowledge was shared with colleagues at the workplace was influenced by different factors. One of those factors is the nature of tacit knowledge itself. According to Shao et al. (2017), tacit knowledge is part of someone's perception, making it intuitive and hard to share. Further, tacit knowledge is difficult to articulate (Narendra et al. (, 2017).

Similarly, Mtsweni and Maveterra (2018) asserted that tacit knowledge is personal and automatic; therefore, explaining it explicitly to others is incredibly challenging. This assertion indicates the complexity associated with the TKS process because it depends on the individual ability to express that knowledge. (Chen et al., 2018) tacit knowledge is hard to capture because it is associated with personal and complicated dynamic human processes. That raises the issue of how to capture an individual's tacit knowledge.

The knowledge capture process concerns conveying tacit knowledge into explicit knowledge form. Agreeing with Chen et al.'s (2018) findings, Wong and Radcliffe (2000, as cited in Ahmed et al., 2018) claimed that converting tacit knowledge into explicit knowledge is challenging. On the other hand, Ouriques et al. (2019) agreed on the difficulties associated with sharing tacit knowledge, but they provided detailed knowledge management-related reasons. Ouriques et al. opined that challenges that make tacit knowledge hard to manage include

complexity, the time needed to convey tacit into explicit and then use, and pressure to deliver the running code by project managers.

Like the above research, Elmorshidy (2016) argued that the challenges facing sharing tacit knowledge are stored in a verbal form. Individuals are often unaware of their expertise and sometimes do not think they must express something obvious. However, Elmorshidy's (2016) research shed light on an important aspect not associated directly with the nature of the tacit knowledge but with the individual's subjective norm. Those aspects are the individuals' perceptions of the ability they hold and its value to their organizations.

From a different standpoint to the TKS about the nature of tacit knowledge, Rumanti and Wiratmadja (2013, as cited in Rumanti et al., 2016) claimed that tacit knowledge is usually stored in an individual's brain and shaped according to environmental conditions in addition to all challenges associated with completing tasks. Rumanti et al. also pointed to the difficulties related to the organizational development environment in which software development tasks are completed.

Applications Development Methods and Methodologies

Several TKS discussed in the literature relate to methods utilized to develop the software application by organizations or the methodologies adopted to control the entire development cycle. Rech and Bogner (2010, as cited in Balle et al., 2018) assessed that in the agile methods, the time available is usually insufficient to follow designated processes, impairing knowledge sharing. Metin's (2019) study revealed that project deadline sometimes hinders the integration of knowledge captured during the project. This finding indicates the importance of addressing project time constraints by organizational decision-makers.

Another example of software development challenges related to the methodology was ways to organize the development processes. Sungkur and Ramasawmy (2014, as cited in Balle et al., 2018) illustrated that traditional methods focus on the documentation process, which can result in making the interactions among employees to build knowledge more difficult (Naim and Lenkla, 2016, as cited in Balle et al., 2018). That indicates application development difficulties tied to communication methods among team members.

Software organizations widely use the agile software development method. However, various research identified TKS challenges associated with the agile methodology. Borrego et al. (2016) identified the challenge of sharing tacit knowledge among team members that are not communicating fact-to-fact directly due to geographical distance and utilizing agile development methodologies where fact-to-fact interactions are preferred. Similarly, Tacit knowledge is susceptible to knowledge hoarding and loss, and employee turnover significantly disturbs its sharing. Consequently, there is a significant gap between what was needed and what was available in the lifecycle of the development system to maintain the agile approach (Nakayama & Kinnett, 2019).

Organizations have shortened software products' lifecycles, which led to the challenge of surviving in the software market only through rapid innovation. (Jain et al., 2019, as cited in Yao et al., 2020). The issue illustrated in the above study connects the software development methodology and the marketing concerns. That highlights the importance of sharing tacit knowledge regarding specific software products if the product lifecycle is limited in the market.

Organizational Culture and Practices

Tacit knowledge-sharing challenges associated with organizational culture and workplace practices are prevalent. Riege (2005, as cited in Castellani et al., 2021) pointed at the lack of

corporate encouragement for knowledge sharing and the absence of leadership regarding a clear communication of knowledge-sharing benefits and values. In the same way, Obrenovic et al. (2020) concluded that acquiring an environment that fuels sharing knowledge are a challenging endeavor.

Mtsweni and Mavetera (2019) identified five human-related issues as barriers among the software development team. According to Mtsweni and Mavetera, those soft issues are verbal communication, lack of critical thinking, weak relationships, human orientation, and personality. Following this line of thought, Nordsieck et al. (2021) claimed that a primary part of knowledge development processes is implicit, which presents difficulties regarding sharing that knowledge among other parties. Nordsieck et al. illustrated that, in that situation, knowledge extraction is needed, but trained and experienced personnel is necessary to tackle expensive and time-consuming processes.

These two studies asserted that most TKS challenges are human-related, requiring addressing them in that context. In the same clause, Ganguly et al. (2019) assessed that the obstacles facing tacit knowledge sharing differ in their natures. Still, they are related to organizational culture, psychological attitudes, and management style. Unlike Ganguly et al.'s (2019) conclusion, Rosa et al. (2016) viewed reward and salary as most negatively affecting knowledge sharing. According to this viewpoint, enhancing the organizational reward system and increasing developers' salaries would influence the TKS level.

Hence, the importance of rewards in sharing tacit knowledge among application developers is prevalent, and organizational leaders cannot underestimate its role as a tacit knowledge motivator. The lack of adequate motivation policies is the primary barrier to valuable knowledge sharing among employees (Hong et al., 2009, cited in Putro & Ilmaniati, 2018).

However, organizational leaders need to identify motivators other than rewards and salaries in this context to capture a holistic view of the issue.

Fuller (2018) illustrated that, even though software development individuals and teams are encouraged to apply their best judgment, they face challenges. According to Fuller, the first challenge was identifying the team's understanding ability other than through its power to implement requirements. Then, how to penetrate the influence of a dysfunctional organizational structure on the development team's collective experience.

Fuller's (2018) article clarified what organizational leaders need to address defects related to organizational structure and team communication practices that negatively influence the TKS. In a slightly different clause, Chantamit-O-Pas (2019) opined that knowledge management processes suffer from challenges such as knowledge transfer, knowledge sharing, culture representation, and domain knowledge. Chantamit-O-Pas here viewed the challenges through the lenses of knowledge management perspectives.

Rosa et al.'s (2016) study has brought unique challenges to the TKS. Rosa et al. argued that it was challenging to retain tacit knowledge, but the complete knowledge released during development projects was not effectively integrated into the organizational knowledge-based repositories. These authors also argued that knowledge drain was a harmful learning practice resulting in hoarding. These issues are strongly related to knowledge management practices, specifically the need for documentation among development team members.

Individual Self-interest

While organizations spend valuable overheads to establish a healthy knowledge-sharing environment at the workplace, many developers still resist sharing their knowledge with others. Kakar (2018) argued that tacit knowledge is transmitted through individual interaction, usually

voluntarily, depending on team members' desires. Further, the reviewed literature about the TKS challenges revealed that individual self-interest contributes to creating such difficulties.

According to Kakar (2018), team members' self-interest often overcomes and makes tacit knowledge sharing difficult. More specifically, psychological factors and change resistance are key factors that impede individuals from sharing their knowledge (Khoza & Pretorius, 2017, as cited in Khoza, 2019). Bhattacharya and Sharma (2019) opined that individuals intentionally conceal or partially share their tacit knowledge. The conclusion of these two articles reveals the need for a better understanding of self-interest motivators.

Further, with today's technological advancement, software development hires developers from different geographical regions to work together in the same development team. These geographical differences create several communication challenges that affect sharing of tacit knowledge between team members. Babič et al. (2019) argued that individuals hide their knowledge from those who work remotely or are distant because they lack a social exchange relationship. Further, Babič et al. explained that the social exchange relationship needs to be long-term, based on mutual and interdependent trust. However, establishing long-term relationships based on trust seems challenging when considering geographical and cultural differences.

Concerns addressing the negative consequences of self-interest on the TSK appeared in various articles. Knowledge hiding as an obstacle to knowledge sharing can be reduced by establishing a teamwork environment, individual trust, and organizational commitment (Evans, 2017, as cited in Bhattacharya & Sharma, 2019). Additionally, Bhattacharya and Sharma (2019) claimed that developers' job insecurity motivates knowledge-hiding behavior, encouraging employees' voluntary turnovers.

Accordingly, and due to the negative consequences of knowledge hiding, organizational leaders must study the knowledge-hiding predictors and mitigate them. The job insecurity aspect raised in Bhattacharya and Sharma's (2019) study needs deep investigations to address its causes. Several studies (Bhattacharya & Sharma, 2019; Khoza, 2019; Semerci, 2019) viewed knowledge hiding as a self-interest behavior from different angles.

Discussing challenges facing the TKS among mobile application developers aids this research's planned approach. Identifying those challenges sheds light on the precision needed to capture better knowledge and address issues associated with sharing knowledge. The literature reviewed in this research revealed that the TKS challenges could be categorized into four groups based on their nature. Those groups are tacit knowledge, application development methods and methodologies, organizational culture and practices, and individual self-interest.

This study addresses the research problem based on organizational culture environment and social exchange behavior between the employee and the employer. Identifying those challenges paves the road to applying the theoretical study framework, as the identified challenges can be addressed on organizational culture and social exchange platform foundations. Tackling the gap in the body of knowledge was better managed when the difficulties identified were mitigated.

Research Approaches Tacit Knowledge Sharing

Three practical approaches were utilized to understand the problem better based on the literature concerning tacit knowledge sharing among project team members in the mobile application development domain. The authors identified research problems through the lenses of factors and processes that influence knowledge sharing, knowledge management viewpoints, and

human-related aspects affecting the sharing processes. These approaches provided a different point of view regarding situations surrounding the methods of sharing tacit knowledge.

Factors and Processes Influence Knowledge Sharing

Researchers mainly utilize this approach to understand better different factors and processes that affect organizations' and teams' ability to control the TKS. Rumanti et al. (2016) addressed the impacts of TKS on the overall KS within small and mid-size enterprises based on identifying indicators of TK of personal interaction and community. Rumanti et al. indicated that establishing policies that support the development of indicators that optimize TK is an excellent approach to optimizing the TKS within an organization.

Utilizing the same line of reasoning, Dogan and Dogan, (2020) identified six items that affect the TKS. Those items are perceived consumer satisfaction, quality, cost management, adaptation, efficiency, and asset management. Based on Dogan and Dogan's viewpoint, the organizational management status could help understand the issues related to TKS. In addition, Khoza and Pretorius (2017) examined factors that influence the tacit knowledge-sharing aspect. Those factors were grouped into individual, organizational, and technological categories. Those three categories contained a total of 33 variables, which questioned the reliability of the study as this number of variables was hard to manage in one study.

Conversely, Jin-Feng et al. (2017) pointed out the importance of establishing an inner tacit knowledge framework that concentrates on TK conversion based on having employees take TK-related and cognitive classes such as practical skill and know-how, experience, and gnosis. In addition to these classes, the framework included incentive and control mechanisms.

The literature considered that agile software development methodology and processes influence the TKS and form a critical approach to the problem. Borrego et al. (2016) posed an

empirical study to understand architectural knowledge sharing in Global Software Development (GSD) teams that utilize agile methodologies. Borrego et al. claimed that elegant and GSD are not entirely compatible because, in agile methodology, tacit knowledge is shared face-to-face as the preferred way among team members.

However, documentation was preferred among the GSD teams due to physical, temporal, language, and inherent cultural distances. With a similar strategy, Chen et al. (2018) focused on studying extrinsic and intrinsic factors that influence sharing knowledge motivation by utilizing the agile method. Further, Nakayama and Kinnett (2019) investigated systems documentation's theoretical and practical challenges in developing organizations adopting the agile approach.

Elmorshidy (2016) examined different tacit knowledge-related aspects, such as the importance of tacit knowledge in today's knowledge-based economy, the strategic utilization of tacit knowledge as an essential competitive advantage, the role of the social network, and existing advancements in gathering and converting tacit knowledge into explicit knowledge. Similarly, Bhattacharya and Sharma's (2019) study compared how and to what extent three knowledge and organizational-related factors could predict knowledge-hiding behaviors in different knowledge-based industries. Those three factors are knowledge-based psychological ownership, organization-based psychological ownership, and territoriality. The territoriality concept refers to the exploitation of the workspace by an individual or group (Aguirre, 2021; Mair & Ruther, 2018)

Conversely, several studies viewed the processes-related approach from different angles. Zhang and Min (2021) examined the relationship between new product development coordination and innovation success, in addition to the mediation roles of knowledge sharing and knowledge hiding. Ganguly et al., 2019) focused on addressing the role played by tacit

knowledge sharing in fostering organizational innovation potential. Furthermore, Balle et al.'s (2018) approach focused on building parallels among methodologies used in software development and their different knowledge cycles.

The same guidelines steered other research regarding TSK concerns. Iriarte-Ahón's (2020) study explored literature to examine the relationships between knowledge-donating and knowledge-hiding strategies as a foundation of intersectional collaboration with the organization. Additionally, Wang et al. (2016) aimed to address the codification and personalization of the collaborative product design based on an integrated computational method that utilizes codified knowledge while incorporating personal problem-solving experience.

Various research-maintained approaches focused on challenges facing the processes of knowledge sharing. For example, Idrus and Ali's (2019) systematic review study focused on identifying and synthesizing challenges regarding tacit knowledge, knowledge management influential factors, and its impact on software testing processes. In the study, significant knowledge management factors affect implicit knowledge creation, sharing, utilization, and transfer between individuals performing software testing.

Maintaining the same assertion, Mtsweni and Maveterra's (2018) research addressed challenges facing tacit knowledge, resulting in a knowledge imbalance that leads to failure in software development projects. That indicates the crucial negative role of poor tacit knowledge sharing in software development project failures. In addition, Benfell (2021) added to the discussion on challenges associated with capturing and meddling with tacit knowledge sharing in software development projects. Benfell argued that the knowledge base emphasizes that using tacit knowledge enhances functional requirement modeling.

Another set of research approaches the TKS issues by studying the relationships between the tacit knowledge process and other behavioral and organization-related processes. For example, based on the Resource-Based View theory, Juan-Ru and Jin's (2017) study examined the relationship between Guanxi, innovation behavior, and knowledge sharing. Similarly, Rumanti et al. (2016) focused on exploring the influence of implicit and explicit knowledge on knowledge sharing in small and medium enterprises. Narendra et al. (2017) focused on examining how tacit knowledge externalization can occur and ways of knowledge retrieval. And driven by the need to understand the importance of knowledge-sharing, Putro and Ilmaniati (2018) examined the relationships between knowledge-sharing activities and the business innovation process.

Knowledge Management Perspectives

Various research focused on approaching the TKS aspect through the lenses of knowledge management strategies. Ahmad et al. (2018), In a quantitative and cross-sectional research design, Ahmad et al. examine the relationships between employee performance, tacit knowledge sharing, and technology usage. The research included implicit knowledge sharing and technology usage as two aspects of knowledge management processes. In the same clause, Ouriques et al. (2019) explored how companies utilize Agile software development to implement knowledge management strategies to boost knowledge processes.

Additionally, the literature indicated that the knowledge management-related approach is prevalent. From the knowledge management perspective, Yao et al. (2020) examined how knowledge sharing affects innovation capability within small and mid-sized mobile software development companies. Chantamit-O-Pas (2019) utilized the exact measurement to apply knowledge metamodel in application software development processes to reduce the gap between

stakeholders and the developing team. Chantamit-O-Pas opined that the metamodel could cause the ability to be shared and transferred to other parties.

Human-Related Issues.

Several researchers have adopted this approach to address issues related to TKS. Mtsweni and Mavetera (2019) addressed the TKS aspect based on its dependency on the human being, the custodian of TK. This approach depends solely on justifying those TKS barriers as human-oriented aspects. Similarly, Khoza's (2019) research examined the knowledge-sharing behavior measurement within the software development teams. That is, measuring the software development team's intentions to share individuals' knowledge and how it affects the overall development projects.

Ingram and Drachen (2020) maintained a different strategy for identifying factors influencing TKS. Ingram and Drachen's research examined the effects of rapidly growing meetup communities on software developers' phenomena. Ingram and Drachen explained that those meetups motivate learning new things, establishing new skills, staying up to date, and enhancing personal networking. Ingram and Drachen based their research on human-related aspects in the context of developers' social life.

Shao et al. (2017) and Castellani et al. (2021) indicated that software development team leads play a crucial role in addressing the TKS problem among team members. Shao et al. (2017) emphasized the importance of the team lead's charisma in establishing the team's psychological safety climate that fosters TKS. On the other hand, Castellani et al. (2021) addressed the problem associated with tacit knowledge sharing regarding knowledge-intensive organizations. Furthermore, Castellani et al. examined developer perceptions regarding knowledge sharing among team members and analyzed both team members' and team leaders' views.

The literature pointed to the role played by organizational leaders in mitigating issues related to TKS. In a qualitative study, Metin (2019) explored factors motivating top public managers and employees to share their knowledge utilizing online organizational platforms. In addition, discovering the differences and similarities between public employees and public perspectives leads managers regarding online tacit knowledge-sharing factors. In the same path, Rosa et al. (2016) established a model to validate the adoption of social media to assist software project managers in the treatment of lessons learned. Rosa et al. targeted capturing tacit knowledge in project managers' minds.

Semerci's (2019) and Obrenovic et al. (2020) studies' findings illustrated the TKS issues based on individuals' behavior platforms. Obrenovic et al.'s (2020) empirical study examined and explained the collaboration between an individual's personality and knowledge-sharing behavior, in addition to exploring the mediating effects of willingness to share knowledge and subject norm. Semerci (2019), with the same guidelines, focused on exploring knowledge-sharing behavior and its relationship with software development employees' perceived conflict types, competition, and personal values.

The literature viewed tacit knowledge sharing through the lenses of factors and processes, knowledge management viewpoints, and human-related aspects affecting the sharing processes. These approaches provided a different point of view regarding situations surrounding the methods of sharing tacit knowledge. However, those lenses did not consider the concept of knowledge capture as a more advanced step in organizing sharing processes.

Factors and processes influence Knowledge Sharing (Dogan, & Dogan, 2020; Khoza and Pretorius, 2017; Jin-Feng et al., 2017), knowledge management perspectives (Ahmad et al., 2018; Chantamit-O-Pas, 2019; Yao et al., 2020), and human-related issues' (Castellani et al.,

2021; Ingram & Drachen, 2020; Mtsweni & Mavetera, 2019; Shao et al., 2017) lenses established a solid foundation to conduct this research. In addition to narrowing down factors, processes, and human-related aspects influencing knowledge sharing, the literature indicated that previous approaches do not include the planned procedure in this research. The characteristics identified in the above studies form a suitable foundation to approach the study research problem.

Tacit Knowledge Sharing Literature Findings and Analysis

The findings of the literature reviewed in this research can be categorized into three primary groups. Those three groups are management styles, individuals' behavior and attitudes, and utilization of technologies.

Management Styles

Management style refers to the strategies or ways the TKS issues can be mitigated. For example, the implicit knowledge indicators identified in Rumanti et al.'s (2016) study are personal interaction, situation, experience, and workplace conditions. Furthermore, Rumanti et al.identified indicators that influence general knowledge-sharing processes, including implicit and explicit knowledge. Those indicators are demographic, learning and market orientations, absorptive capacity, positive interaction, trust, and reward system. Accordingly, these indicators can be addressed by organization visions established by leaders.

Similarly, Jiang and Xu (2020) argued that administrative change elements could severely affect employees' knowledge-sharing mechanisms. Furthermore, Jiang and Xu added that the managerial incentive policies targeting the stimulation of knowledge sharing must be carefully addressed. According to Shao et al. (2017), a charismatic leader should focus on a leadership style that influences others through idealized influence and charisma instead of

authoritative abilities. This view indicates that management style could influence the employees' knowledge-sharing behavior.

Several studies indicated that identifying factors influencing the TKS problem resides at the core of managerial duties. Khoza and Pretorius (2017) suggested that job security, motivation, time constraints, physiological factors, communication, change resistance, and reward significantly affected knowledge sharing. In the same pool of ideas, Chen et al. (2018) concluded that raising the practitioners' awareness of the benefit of knowledge sharing is essential for success.

Slightly different from relating the mitigation of the TKS issue to the management processes only, Yao et al.'s (2020) argued that the combination of managerial style and the utilization of technology could positively contribute to the issue. Yao et al.'s findings reveal that knowledge-sharing culture, organizational structure, middle-level leadership, and system management approach positively affect tacit knowledge-sharing. However, the management system approach and IT support significant effects on explicit knowledge sharing. Furthermore, implicit and explicit knowledge significantly affects the technological innovation capability of software development enterprises (Yao et al., 2020).

The role of organizational management in establishing motivators for an employee to share knowledge was present in the research findings. Motivational, social, and national culture strategies influence individual and group creative capacity. The study results also indicated a lack of agreement about knowledge sharing and hiding motivations and a narrow understanding of behavioral strategies that cause knowledge hiding (Iriarte-Ahón, 2020). Further, Khoza (2019) illustrated that knowledge leakage increases because developers rapidly move from one software development organization to another. Iriarte-Ahón indicated that factors that cause employee

turnover include management style, business psychology, business relations, individual morals, and organizational culture.

As viewed in Nakayama and Kinnett's (2019) and Nordsieck et al.'s (2021) studies, the management in the software development organization was crucial in establishing processes by which the TKS problem could be mitigated. For example, Nakayama and Kinnett (2019) concluded that, depending on system design and the abstraction level of system knowledge, the documentation processes need to be produced in the lifecycle of system knowledge. Additionally, Nordsieck et al. (2021) proposed a decentralized tacit knowledge extraction approach by systematically gathering the knowledge in an example-based way during the production phase.

Additionally, Mtsweni and Maveterra's (2018) research reflected the identification of ten different interrelated issues that influence the process of knowledge sharing. Those issues include trust, time, maturity of knowledge, understanding of knowledge, the complication of the knowledge, articulation of the knowledge, source of the tacit knowledge, explanation of the knowledge, context, and usefulness. Mtsweni and Maveterra's findings indicated that knowledge management strategies adopted in agile software development organizations encourage knowledge transfer through social interaction practices to share tacit knowledge.

Individual Social Behaviors

Findings related to individuals' social behaviors suggest that TKS issues could be addressed in the context of human behavior when influenced by interactions with others. Dogan and Dogan, (2020) argued that the TKS could increase internal motivations related to socialization and friendships. Dogan and Dogan claimed that social interactions are valuable facilitators for TKS. Similarly, Mtsweni and Mavetera illustrated that the level of TKS increases

when the SDT team member is human-oriented and maintains adequate interactions and communications with the team members. Further, Borges et al. (2019) concluded that organizational commitment and solid social ties are crucial in TKS.

Alike, Jin-Feng et al. (2017) illustrated that socialization among enterprise employee help increases the rate of sharing and transforming tacit knowledge into tacit knowledge (TK). Employees accumulate and share both experience and skill. As a result, new TK is created and shared among other individuals (Jin-Feng et al., 2017). Furthermore, Jin-Feng et al. highlighted the importance of establishing an organizational common sharing platform and incentive mechanisms to encourage creating and sharing the TK.

In the same clause, Kakar's (2018) research indicated that combined factors have a coactive impact on the process of knowledge sharing, and meetup enables trust to establish easy ways to share knowledge. Kakar also pointed out that face-to-face meeting enables surfacing and the exchange of valuable tacit knowledge with relevant details. In addition, meetups allow members to draw conclusions based on a larger pool of ideas.

The literature reviewed findings addressed the TKS and hiding from a behavioral standpoint. The sharing of tacit knowledge has a significant positive impact on enhancing innovation behavior and plays a limited mediator role in the relationship between Guanxi and innovation behavior. (Juan-Ru & Jin, 2017). According to Juan-Ru and Jin (2017), in Chinese society, Guanxi is an interactive relationship among individuals that includes reciprocity, obligation, and gratitude identified by the sustained exchange of favors with others.

Khoza's (2019) findings revealed that developer attitudes are a significant motivator of knowledge-sharing behavior, and team members can share their knowledge when they receive compensation. Semerci (2019), with the pool of ideas, uncovered that task conflict and employee

relationship conflict significantly influence knowledge-hiding behavior. Further, task conflict is related to competition perceived by employees. Nevertheless, the perceived competition mediation role was insignificant among conflict type and knowledge hiding.

Knowledge-hiding behavior greatly endangers TKS behavior. Bhattacharya and Sharma (2019) discovered that corporate psychological ownership directly affected knowledge-hiding behavior mediated by workplace territoriality. In addition to revealing that workplace territoriality is an antecedent to knowledge hiding within all Indian knowledge-based industries.

Utilization of Technology

The utilization of technology refers to the findings indicating the importance of using technology in mitigating aspects of TKS. The first key finding of Buunk et al.'s (2019) study is that the surveyed online environment enables learning processes, sharing expertise, enhances problem-solving, and helps organizational innovation through social interactions. The study's second finding was that two-thirds of the participants substantiated that the technological features in their working environment have significantly facilitated social interactions.

Narendra et al. (2017) suggested enhancing the organizational knowledge system by utilizing Chat Bots to convert tacit knowledge into explicit knowledge through experts' interviews, questionnaires, and symbolic methods. Narendra et al. believed that a redundant Chatbot could help experts share and store their knowledge, then users can retrieve it using a query system. Social communication tools are also considered in the finding. Borrego et al. (2016) argued that to bridge the gap between agile methodology and GSD, a tool to structure and manipulate architectural knowledge communication through chats, emails, and forms among members of the GSD team utilizing the agile methods.

The literature illustrated several frameworks that could share tacit knowledge among team members in the online environment. Borrego et al. (2016) introduced a theoretical model for tacit knowledge creation, conversion, sharing, and success. Elmorshidy (2016) proposed a model intended to facilitate implicit knowledge sharing. According to Elmorshidy, the model was theoretically based on the DeLone and McLean information systems (IS) success model. Similarly, Metin's (2019) study revealed that young and well-educated employees predominantly use online tacit knowledge-sharing platforms. Metin also indicated that most top managers considered the employees had significant responsibility and impact in fostering online implicit knowledge sharing.

The recent literature findings concluded that organizational management approaches, developers' social behaviors, and technology usage are primary components that can help reduce knowledge hoarding. The theories included in the study's theoretical framework explain organizational management approaches and developers' social behavior components. However, utilizing technology strengthens organizations' ability to establish knowledge-capturing solid processes. Generally, the three members precisely serve to resolve the research problem.

Synthesis of the Research Findings

Based on the literature presented in this chapter, it was evident that investigating the factors that influence tacit knowledge sharing is pertinent and prevalent in the software development field. This importance accounts for why researchers and practitioners' global communities are utilizing various approaches, methodologies, and theories to fill the gap in the body of knowledge in the area. This section established a synthesis of current research findings as a precedent for this research.

Several studies have addressed knowledge-hoarding behavior in the context of self-interest behavior. Semerci's (2019) and Bhattacharya and Sharma's (2019) studies examined knowledge-hiding predictors in the context of an obstacle to knowledge-sharing. However, both studies examined the knowledge-hiding issue of human self-interest and neglected the importance of self-interest in motivating knowledge behavior (Babič et al., 2019). This sentiment was shared in Kakar's (2018) findings which revealed that, sometimes, team members attempt to maximize their payoff through knowledge sharing.

Regarding tacit knowledge sharing, while Narendra et al. (2017) and Borrego et al.'s (2016) findings indicated the importance of utilizing technological tools in sharing process, Obrenovic et al.'s (2020) findings indicated the importance of willingness to share tacit knowledge in addition to the usage of technology. Obrenovic et al.'s findings revealed that willingness to share knowledge was a significant predictive factor in knowledge sharing among individuals besides top management support and technology. These findings were supported by other literature. Idrus and Ali (2019) considered the convenience of knowledge management systems, technologies, and individuals' willingness to share tacit knowledge among influential factors.

Furthermore, the literature discussed knowledge sharing based on regional or country knowledge cycles. Balle et al. (2018) named them the Japanese, European, and American knowledge cycles. For example, the Japanese knowledge cycle is divided into four phenomena: socialization, externalization, combination, and internalization (SECI model). However, according to Igbal (2021), this classification lacks the organizational granularity required for a knowledge management culture. Igbal claimed that culture is an asset of any organization, and each organization owns its unique way of managing knowledge. In addition to that, Adesina and

Ocholla (2019) argued that The SECI model's socialization mode could not be considered a strong influencer in tacit knowledge sharing.

Literature on the effects of organizational reward policies (Khoza, 2019; Khoza & Pretorius, 2017; Rumanti et al., 2016) discussed in this research assessed the reward utilizing various theoretical models. It was noteworthy that the literature did not consider reward policies based on either organizational culture or organizational management theoretical foundations. In addition, employee regulation compliance and affective commitment attitudes have not been considered factors are influencing tacit knowledge sharing among software developers.

Summary

This study focused on the role of knowledge capturing in the software development projects of the mobile applications domain to resolve the problem of poor tacit knowledge sharing among project team members. Against this background, this chapter synthesizes the literature for concepts relevant to the research. The study's ideas include knowledge sharing, knowledge capturing, knowledge management, reward policies, regulation compliance, affective commitment, organizational culture, and social exchange. The corporate culture and social exchange models have been utilized to access knowledge management in many areas, including tacit knowledge sharing and capturing (Yang & Chen, 2020; Zhang et al., 2018).

Theoretical models based on organizational culture and social exchange theories have been widely utilized in technology and non-technology studies. These models' common usages are simple, robust, easy to use, and extendable to accommodate more variables (Dwi et al., 2020; Liu et al., 2021; Malik et al., 2021; Okudan et al., 2021). Besides the organizational culture theory, the social learning theory contributes to how learning occurs in a social setting and helps explain factors that facilitate the learning processes.

Knowledge capture as a construct was included in this theoretical research framework because, according to Metin (2019), it influences knowledge sharing and the overall knowledge management processes. Thus, indicating that knowledge capture is crucial for improved knowledge sharing in IT teams and mobile software development. Knowledge capture is vital in many countries (Balle et al., 2018) and organizations, regardless of their business sizes or specializations.

The literature discussed revealed general agreement regarding the benefits of maintaining a healthy environment of tacit knowledge. Various vital elements needed for better knowledge sharing include developers, organizational leadership, trust, knowledge management systems, technologies, and frameworks (Jiang, & Xu, 2020; Mtsweni & Mavetera, 2019; Shao et al., 2017). However, the same literature revealed numerous challenges organizations must overcome to increase tacit knowledge sharing. Researchers maintained various approaches to address challenges and obstacles facing knowledge sharing among software developers.

As revealed by the literature reviewed, challenges facing tacit knowledge sharing are related to three categories: implicit knowledge nature, applications development methods, development methodologies, and organizational culture and practices (Ahmad et al., 2018; Mtsweni & Maveterra, 2018; Ouriques et al., 2019). Additionally, Metin (2019) argued that it is crucial to understand developers' mindsets about sharing their knowledge to achieve organizational knowledge management goals. Consequently, there is a need for continuous discourse and advancement of knowledge capture in the software development domain. This research maintained a quantitative correlation method to predict factors that influence the knowledge capture aspect.

Chapter 3: Research Method

Introduction

This study addressed mobile application developers' poor tacit knowledge sharing (Mtsweni & Mavetera, 2019). Several studies indicated that success in mobile software projects is only 29%, and 52% were achieved with several challenges (Balle et al., 2018; Khoza & Pretorius, 2017; Metin, 2019; Snelson, 2016). Further, software developers with advanced programming skills hide their knowledge and perceive it as job security or generate more financial benefits (Khoza & Pretorius, 2017). This problem impacts organizations and practitioners by decreasing technological innovation speed and limiting competitive advantages (Jin-Feng et al., 2017).

Therefore, this quantitative correlation research aimed to establish structural mechanisms based on organizational culture and social exchange factors that predict organizations' ability to capture developers' tacit knowledge. Further, establishing a theoretical model for identifying tacit knowledge capturing could help software development organization leaders more accurately enhance the implicit knowledge-sharing level and maximize its benefits. In this study, the relationships between tacit knowledge capture (TKC), organizational reward policies (RP), programmer's regulation compliance (RC), programmer's affective commitment (AC), the programmer's category (P_LVL), and the number of experience years (EX_LVL) were analyzed. The EX_LVL independent variable was a moderator between the programmer's class and the TKC variable. In addition to examining the moderating effects of participant's programming category between the TKC and the three predictors, RP, RC, and AC predictors.

This chapter illustrated the research methodology and design used to solve the research problem, including determining the research population, sampling approach, and calculating the

appropriate sample size. Further, the research instrument explained how data related to each variable was measured. Then, the variables included in the research were defined from operationalization perspectives in the study context.

Additionally, the steps regarding loading collected data into the SPSS v.28 for different preparation processes were shown. Instrument validation tests and steps were explained based on preliminary and primary analysis. These included how the research model would fit the data collected and lead to the research instrument's validity and reliability utilizing the IBM-AMOS v.27 software. Research assumptions, limitations, delimitations, and ethical aspects were illustrated. A summary of this chapter's components was added at the end.

Research Methodology and Design

In this research, the design and methodology utilized were determined based on prior research's utilization of theoretical frameworks like the one employed in this study. In a similar analysis regarding organizational knowledge sabotage, Perotti et al. (2021) established a theoretical framework to identify factors influencing employee knowledge sabotage behavior. This study aimed to identify organizational factors that help predict organizations' abilities to capture their mobile application developers' tacit knowledge.

The quantitative approach adopted in this study intended to collect accurate data, and this intention was inherent in all similar research (Li, 2020; Perotti et al., 2021). Based on the research questions, this quantitative approach allows measuring and analyzing the prediction ability of the five independent variables to contribute to tacit knowledge capturing. The programmer's number of years in the current role was an ordinal independent variable. The number of years was used to examine its moderation effects on tacit knowledge-sharing behavior for each category of programmer's layers. The programmers' layers are defined as the role

classification for each programmer's organizational stratification. Four layers of programmers are determined in this research: junior, mid-level, senior, and manager-level programmers.

A quantitative non-experimental was used in this study using a closed-ended one-time anonymous questionnaire accessible online. Internet-accessed questionnaires are commonly utilized in academics and business and help increase accessibility for research participants (Ciotti et al., 2019; Kuwamura et al., 2021; Mertens & McLaughlin, 2004). Appendix A shows the survey instrument comprising multiple sections allowing responders to enter their answers and return completed surveys electronically.

A vital advantage of the quantitative correlation approach is that more than two variables can be included in the research (Ciotti et al., 2019; Mertens & McLaughlin, 2004). The design of this research was non-experimental. Variables were measured with no manipulation of the independent variables. The non-experimental research design is appropriate for this research because it can establish causality relationships among the variables (Ciotti et al., 2019; Roberts, 2020).

Alternative methodologies for this research are descriptive and casual-comparative approaches. Like the non-experimental method, the variables cannot be controlled or manipulated in the descriptive methodology research. The descriptive research approach is the most appropriate when the study aims to discover the phenomenon's frequencies, trends, or characteristics (Kusuma et al., 2019; Maulidiyanti, 2018). The descriptive research method provides snapshot insights regarding the current state of the phenomenon.

On the other hand, the casual-comparative approach was not adopted in this research because it adds complexity to the research procedure. It makes the data collection stage more difficult and unable to estimate the magnitude of relationships among the studied variables. The

correlation method in this research meets the requirement of illustrating the extent of relationships between the knowledge sharing (criterion variable) and the three predictors and the moderator variables (Vukojević Borislav, 2016). Furthermore, the correlation approach is aligned with the study's prediction of factors influencing the tacit organizational knowledge captured in mobile application development.

Population and Sampling

Population

According to Yang et al. (2021), the knowledge stock in an individual's brain is negatively correlated to intentions related to hiding. The organizational incentive policies influence knowledge from others and knowledge-hiding behavior. Furthermore, experienced employees intend to hide their knowledge from colleagues to retain their portfolios (Labafi, 2017). That indicates the influential role of the level of skills employees maintain in the entire process of capturing tacit knowledge.

The population of this study included mobile application developers working in software development and participating or influenced by implicit knowledge-hiding behavior in the United States. The targeted populace in this study was categorized into four layers of mobile application programmers: junior, mid-level, senior, and manager-level. That includes only those who perform mobile software development with various skill levels and experiences. According to Glutch (2021), these developers are employed by 4,285 mobile application development organizations. The non-programming staff is not included in the population.

Sample

The random sampling technique was preferred over the non-probability sampling methods in this research because of its probabilistic characteristic and ability to generalize to the

population (V & Jothi, 2021). The probabilistic feature was essential because it is the most unbiased form of sampling and offers every population representative an equal opportunity to be selected (Obaidat et al., 2021). Clustered sampling method could have been considered an alternative but was not preferred because it includes a high risk of bias if the selected clusters are not accurately representative of the research population (Casper-Emil et al., 2015).

The SSPS v.28 established random sampling among the organizations from the research population. The SSPS's Random sampling feature was utilized to finalize the sampling steps. The sample was 30% of all mobile application development organizations listed. The survey link was sent to selected organizations. Only responses from those who work as mobile application developers and are classified as one of four programmers' layers were accepted.

Responders to the survey formed the participants' sample for this research. An a-priori sample calculator for structural equation model analysis was used to calculate the minimum sample size required in this research. Several parameters were tested to calculate the sample size for the study. It has been found that with the desired statistical power level of 0.80 and an anticipated effect size of 0.3 (medium). In addition to that, with five latent variables, 28 observed variables, and a probability level of 0.05, the minimum sample size for the SEM was 148 participants, and the recommended minimum sample size was 150 participants, as shown in Appendix B; the latent and observed variables are listed in Appendix A.

Research Instrument

A survey methodology was utilized to collect research data. The survey method was reliable in quantitative studies because it has a high external validity (Coppola, 2014; Nielsen & Knardahl, 2016). The survey's internal reality was addressed by utilizing previously validated survey components applicable to the current research. Furthermore, previously validated survey

items are extensively used in related studies' reviewed literature (Dodd et al., 2021; James et al., 2020). Appendix A shows the complete instrument utilized to collect participants' responses. In section A, the participants choose their programming role layer and indicate the number of years of programming experience. Sections B through E comprise the four latent variables and lists of observed variables.

Maymone et al. (2018) recommended utilizing an effective tool to collect data for this research. The Qualtirics software tool was used to manage the data. The research population received the distributed web-based survey link through their organizations' managers. Leonardi et al. (2020) depicted that web-based surveys offer efficient data gathering. Further, Maymone et al. (2018) argued that the advantages of the online survey methodology appeal to surveyors because of its fast data collection, swift analysis, and rapid development and administration.

Furthermore, in sections B through E in appendix A, the Likert-scale seven-point items survey was designed to collect data for four latent variables appropriate for the designated analysis techniques. Within the instrument, section A allows participants to enter categorical data for two independent variables. Then, the proper analysis tool and method are selected based on the data's nature.

The introduction section of the survey provided a brief background about the research and the author, research eligibility, and the consent to participate. Section A allows participants to select the range of years of experience and determine their stratification. The following section indicates question statements defining commitment to the organization. Then, section C includes question statements explaining knowledge sharing and capturing in the organization. Question statements describing regulation compliance in the organization were contained in section D. Section E includes question statements relating reward policies in the organization. Sections B

through E of the instrument include a component to measure each construct based on a seven-point Likert scale ranging from strongly agree to strongly disagree.

Regardless of the methodology used, the research validity and reliability are crucial to ensure quality measures. According to Catz et al. (2021), validity safeguards the study appropriately and accurately measures the intended. Creswell (2014) argued that validity ensures in three ways: research constructs, content, and concurrent validity. Concurrent validity refers to how a researcher's measurement comprises a shared size acquired around the same time.

Similarly, research reliability refers to the extent to which the research instrument was consistent in its ability to be reproducible and successfully useable in similar conditions. Cronbach's alpha coefficient was used to validate the instrument's internal consistency. According to Novak (2020), Cronbach's alpha coefficient was used in research for multiple Likert scale items to ensure that researcher was using a reliable tool. In addition, Cronbach's alpha coefficient analysis provides an overview and suggestions to delete specific construct items if they negatively affect Cronbach's alpha coefficient value.

Operational Definitions of Variables

The targeted variables were organizational tacit knowledge capture (TKC), administrative reward policy (RP), programmer regulation compliances (RC), programmer affective commitment (AC), programmer's years of experience (EY), and programmer's category level (PC). These variables are defined and operationalized in this section's context of this study. These ordinal variables were measured utilizing previously validated models and instruments.

Establishing adequate tacit knowledge capturing among mobile applications was assumed to be an efficient approach to addressing implicit knowledge sharing among development teams' members (Dzekashu & McCollum, 2014). Accordingly, identifying organizational factors that

predict the TKC was anticipated to resolve the research problem. The RP, RC, and AC were chosen in this research to predict the TKC and to examine their significant effects on organizational knowledge capturing.

Organizational Tacit Knowledge Capturing

Tacit knowledge-capturing processes describe the extraction of know-how from individuals, groups, or organizations to benefit the same entities (Dzekashu & McCollum, 2014; Sandelin et al., 2021). Dzekashu and McCollum (2014) opined that the processes comprise identifying, acquiring, refining, and storing knowledge to be disseminated to all organization members. In this study, the TKC was an independent variable measured using the knowledge success model established in DeLone and McLean's information system success model. This ordinal variable was operationalized using section C of the study instrument.

Organizational Reward Policy

The organizational reward policy was an ordinal variable operationalized using section E of the instrument constructed for this research. It captures the degree to which survey participants believe that the reward policy set by the organization helps in sharing their tacit knowledge. Section E included seven items on the Likert scale ranging from strongly disagree (1) to (7) strongly agree. The overall ranking for the seven items averaged a score between 1 and 7.

Developer Regulation Compliances

Employee regulation compliance was an ordinal variable operationalized using section D of the instrument constructed for this research. According to Al-Izki and Weir (2016), regulation compliance reflects how the employee adheres to various guidelines and rules set by the organization regarding how workplace activities and tasks must be completed. Section D

included seven items on the Likert scale ranging from strongly disagree (1) to (7) strongly agree. The overall ranking for the seven items averaged a score between 1 and 7.

Developer Affective Commitment

The employee affective commitment was an ordinal variable operationalized using section B of the instrument constructed for this research. Affective commitment refers to an employee's emotional attachment to the organization. It measures the degree to which an individual is psychologically attached to their employer based on feelings (Erdurmazli, 2019). Section B included seven items on the Likert scale ranging from strongly disagree (1) to (7) strongly agree. The overall ranking for the seven items was averaged into a score between 1 and 7.

Programmer's Category

The programmer's category was a categorical variable utilized to predict tacit knowledge capturing. Further, the variable comprises four layers of programmer's stratification: junior-level, mid-level, senior-level, and manager-level. Additionally, the variable was a relationship moderator between tacit knowledge capture and organizational reward, regulation compliance, and affective commitment predictors. Participants can select one category option in section A of the survey instrument.

Years of Experiences

The programmer's years of experience was an ordinal variable utilized to examine its moderating effects on the relationships between the programmer's category and behavior related to sharing tacit knowledge. Participants were asked to select one choice that best describes the number of experience years as programmers.

Table 2

Research Constructs and Measures

Constructs	Measures and Sources
Tacit Knowledge Capture	Source: (Slavinsky, 2016) - My organization's knowledge management system allows my coworkers and me to exchange - Ideas and thoughts on standard work practices. - The knowledge management system initiative has received sufficient resources (people, money, etc.) to facilitate its success. - Since its inception, the volume of knowledge contained within the knowledge management system has consistently increased. - The knowledge management systems meet the knowledge needs of my area of responsibility. - The knowledge management system is very efficient. - The knowledge management system is very effective. - My organization's knowledge management system provides me with the necessary knowledge. - My organization's knowledge management system provides knowledge from multiple sources that are adequate for me to finish tasks and make decisions.
Organizational Regulation Compliances	Source: (Moody et al., 2018) - Complying with administrative regulations' procedures is typical of "me." - Complying with administrative regulations and procedures is something I have been doing for a long time. - Complying with administrative regulations and procedures makes my work more difficult. (R) - Complying with administrative regulations and procedures inconveniences my work. (R) - Complying with administrative regulations and procedures is something I do automatically.

	- Complying with administrative regulations and procedures is something I do without having to remember consciously. - Complying with administrative regulations and procedures makes me feel weird if I do not do it. - Complying with administrative regulations' procedures is something that belongs to my (daily, weekly, and monthly) routine. - Complying with administrative regulations and procedures is something I start doing before realizing I'm doing it. - Complying with the administrative regulations' procedures would be time-consuming. (R)
Organizational Rewards Polices	Source (Lin, 2007) - I will receive a higher salary in return for my knowledge sharing. - I will receive a higher bonus in return for my knowledge sharing. - I will receive increased promotion opportunities in return for my knowledge sharing. - I will receive increased job security in return for my knowledge sharing.
Employee Affective Commitment	Source: Myer *et al.*, 1993 - I would be delighted to spend the rest of my career with this organization. - I feel as if this organization's problems are my own. - I do not feel a strong "belonging" to my organization. (R) - I do not feel "emotionally attached" to this organization. (R) - I do not feel like "part of the family" at my organization (R) - This organization has a great deal of personal meaning to me.

As shown in table 2, measures and sources of all research constructs are shown. However, the calculations associated with (R) indicate that the action was reversed-coded. The purpose of utilizing reversed-coded questions in surveying was to identify response biases (Wilson et al., 2016). The data preparation stage of this research comprised the step of recoding

responders' entries of each reversed-coded question to align it with the non-reversed-coded questions.

Study Procedures

This research employed a quantitative method, and the primary instrument of the data collection process was a web-based survey. The participants received the survey weblink by email. Data collected in this research did include any participants' personally identifiable information. Further, the participants are expected to answer questions in the five sections, A through E.

The statistical power of the research analysis depends on the sample size that responded and returned to the survey. A low response rate was one of the primary challenges researchers must mitigate (Kuwamura et al., 2021). For this study, the plan to tackle the survey's low response rate depends on recommendations illustrated in Muijs's (2011) article. Muijs recommended establishing a short and attractive questionnaire that takes 30 minutes to complete. Furthermore, promise and provide a reward, such as book tokens, vouchers, etc., for those who achieve and return the survey.

As shown in Appendix A, the section contains background about the study and the informed consent statement for participating and shows the voluntary nature of participation. The unit includes verification regarding if the participants work as mobile application programmers. Participants were asked to determine their programming skill level and given four distinct choices. The programmers' stratifications mechanism was based on their roles within the organization. Even though the survey was expected to take about 25 minutes, there was no time limit to complete the survey.

However, participants were expected to complete and submit their responses within two weeks of receipt. After one week of distributing the online survey, the plan was to follow up with participants through emails as a reminder. Participants were given more time to complete and submit the survey. Lastly, the collected data were entered into the SPSS software for further screening, cleaning, and analysis.

Data Pre-screening

This research collected data from participants utilizing a web-based Qualtrics survey to answer research questions and test hypotheses. The research survey link was distributed via email. The online survey allowed researchers to receive the completed survey once the responder submitted the study. This way of collecting research data was selected because it was convenient and inexpensive. Maymone et al. (2018) argued that the advantages of the online survey methodology appeal to surveyors because of its fast data collection, swift analysis, and rapid development and administration (Maymone et al., 2018).

Only complete and valid survey data was entered into the analysis tool for further processing. Once the data collection step was done, the data collected was loaded into Statistical Package for Social Science (SPSS) for further analysis. However, the critical step after loading the data from the web-based survey was checking and validating the collected entries. The stage was crucial for multiple reasons: addressing missing data, abnormal scores, response-set, or multivariate outlier issues (Khan et al., 2020). Research data pre-screening also includes examination for response-set. The response set is the individual's tendency to respond to a question or statement that reflects a specific image of the respondent rather than providing answers based on the individual's actual feelings or behavior (Eysenck & Eysenck, 2021).

Data Cleaning and Preparing

Missing data and outliers' values comprise a threat to research analysis and must be adequately addressed. The SSPS tool handles the missing value based on its form pattern. Possible dataset missing practices are missing not at random (MNAR), missing at random (MAR), and missing completely at random (MCAR) (Dávid et al., 2017; Grigsby & McLawhorn, 2019). The missing data were addressed according to the SSPS's absent data analysis. According to Grigsby and McLawhorn (2019), there are three primary approaches to handling dataset missing values. Those approaches are multiple imputations, multivariate imputation by chained equations, and complete information maximum likelihood.

A descriptive analysis was performed using the SSPS's boxplot chart to visualize data distribution and identify potential outliers' values, if any, to plan how to handle them according to their nature (Banerjee et al., 2021). Extreme outliers' weight would have negative influences on the final statistical analysis. If the collected data contains extreme outliers, the Weight Calibration Method (WCM) introduced in Wada's (2020) study was employed to address it. The WCM was performed utilizing the SSPS's multivariate outlier detection feature. Further, the SSPS tool was used to decode the values of reversed-coded measures as needed.

One of the primary issues the self-reported survey faces is dishonesty (De Schrijver, 2012). An example of speedy and dishonest responses is when responders enter the same value across all questions. For example, when the responder enters a value of 2 on a Likert scale for all sets of questions. In this case, the entire responder's survey input was eliminated. After the data pre-screening and cleaning stage, the dataset was considered for the primary research analysis.

Data Analysis

After completing the research instrument analysis, the preliminary and primary stages of the research investigation were started. The research hypotheses were assessed using structural equation modeling (SEM) and multigroup analysis. The SEM has been considered predominantly appropriate for examining theoretically justified models because it provides a simultaneous evaluation of measurement quality and reveals causal relationships among research constructs (Abd-El-Fattah, 2010; Lin, 2021).

Preliminary Analysis

The preliminary examination of the study comprises an initial analysis to ensure the validity of the research instrument. The survey link was distributed to an independent sample, and the valid survey entries were entered into the SSPS to perform the preliminary analysis. A principal components analysis (PCA) was performed to examine the validity of the research instrument. The PCA method is needed because the Varimax rotation offers advanced alignment of the observed variables with their latent constructs through the rotating dataset axis.

The PCA with a Varimax rotation was conducted to ensure the research constructs' validity and reliability. Cronbach's Alpha was utilized to evaluate the reliability and internal consistency of the scales. According to dos Santos Barros et al. (2021), the acceptable value of Cronbach's Alpha must be between 0.65 and 0.80. The results from PCA's preliminary examination were utilized to gauge the validity and reliability of the survey items for the primary analysis.

Primary Analysis

The primary phase of the investigation was started after completing the analysis of the research instrument. The preliminary study assessed the research hypotheses, and the result was

reported. The structural equation modeling (SEM) approach was utilized for testing the assumptions associated with the research model. Table 3 shows the hypotheses planned to be tested in this primary analysis.

Table 3

Research Hypotheses List

Research Hypotheses
$H1_0$: The organizational reward policy, alone or combined with other factors, does not significantly affect the tacit knowledge capture of the mobile applications development based on the programmer's category.
$H1_1$: The organizational reward policy, alone combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's knowledge.
$H2_0$: The employee affective commitment, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category.
$H2_1$: The employee affective organizational commitment, alone or combined with other factors, significantly affects the tacit knowledge capture in the mobile applications development based on the programmer's category.
$H3_0$: Organizational regulation compliance, alone or combined with other factors, does not significantly affect the tacit knowledge capture in mobile applications development based on the programmer's category.
$H3_1$: Organizational regulation compliance, alone or combined with other factors, affects the tacit knowledge capture in mobile applications development based on the programmer's category stratification.
$H4_0$: The programmer's years of experience do not moderate the relationships between tacit knowledge capturing and the programmer's category.
$H4_1$: The programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category.

$H5_0$: The programmer's category does not moderate the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

$H5_1$: The programmer's category moderates the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

Structural equation modeling has been particularly appropriate for testing theoretically justified models within information systems research. It allows simultaneous evaluation of measurement quality and the causal relationships between constructs (Amornkitpinyo et al., 2021; Pei et al., 2021). SEM techniques provide more rigorous and flexible testing of complex predictive models than comparable multiple regression techniques (Liu & Kang, 2021). The IBM SPSS-AMOS v.26 statistical software was used to conduct the SEM analysis.

After preparing and cleaning the primary data collected for the research, the preliminary SEM testing will begin. The SEM analysis was performed in five logical steps in this research. According to Abd-El-Fattah's (2010) and Lin's (2021) studies, those five logical steps are model specification, identification, parameter estimation, model evaluation, and model modification. The model specification step defines the hypothesized relationships between research variables in structural modeling (Abd-El-Fattah, 2010).

Abd-El-Fattah also indicated that the model identification step concerns whether the model is over-identified, just-identified, or under-identified. However, to estimate the model coefficient, it has to be either a just-identified or over-identified model (Ravider & Saraswathi, 2021). Fan et al. (2016) opined that estimation of model coefficients could be done when the model is just-identified or over-identified. The SEM model evaluation processes concern assessing the model's performance or fit utilizing the quantitative indices calculated for the

model's overall goodness of fit (Fan et al., 2016). Additionally, the model modification step concerns applying post hoc changes to the model's elements to improve the model fit.

The steps described were performed utilizing the AMOS tool. Before performing hypothesized paths, a confirmatory factor analysis (CFA) was completed using AMOS. The CFA comprised four latent constructs and 26 observable scale items. For each construct, multiple validity points were considered in the analysis.

The AMOS tool supports various overall goodness of fit indicators to denote how the measurement model fits the research data. Those indicators include the chi-square good of the appropriate needle, the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), and the basis means squared error of residual (RMR). According to Aydin and Celik (2017), the GFI, adjusted goodness-of-fit index (AGFI), normed-fit index (NFI), and non-normed fit index (NNFI) shall be greater than 0.9 for model fits. On the other hand, Huang et al. (2021) indicated that the chi-square should be insignificant, and RMSEA and RMR should be less than 0.08.

Various statistics and measures were utilized to evaluate the reliability and validity of the scale items comprised in the measurement model. The average variance extracted (AVE) was examined to assess the convergent validity (dos Santos & Cirillo, 2021). According to dos Santos and Cirillo, the recommended minimum AVE for the considered constructs is 0.50. According to Dos Santos Barros et al. (2021), the evidence of scale item reliability can be collected from the values indicated by Cronbach's Alpha. Dos Santos & Cirillo opined that all deals must be greater than 0.75. additionally, the multiple square correlations (SMCs) were computed for each scale included in the research.

Further, the discriminant validity was assessed by testing the cross-loadings and examining the correlation between constructs and the AVEs' square root (Voorhees et al., 2016). The model must pass the discriminant validity test. The overall fit-measurement model was examined by ensuring the inclusion of the 24 scales in the measurement model. The GFI, AGFI, and NFI values must be within the threshold; the RMSEA and RMR values must be significant.

The structural model analysis was performed to illustrate the significance of the hypothesis's paths. An additional hierarchical regression analysis was completed to validate the paths between the research-independent and dependent variables. Finally, the above-described tests and examination results will be reported and interpreted as findings of this research study.

Assumptions

This research's central assumption revolves around the perception that developers' programming skills could be stratified based on their organizational programming ranking, such as junior, senior, etc. Accordingly, based on that distinct stratification, the participants' responses reflected the relationship between the tacit knowledge capture and the other three predictor variables. Another assumption was that the participant's eligibility criteria for the research were to acquire the participants' targeted minimum number and qualifications. It was also assumed that the research methodology, design, and question were appropriate and would lead to the anticipated findings. Finally, the research data analysis and outcomes were modified to suit the author's narrative.

Limitations

Like all research, this study has limitations. However, the hope was that the shortcomings involved in the investigation would be tackled as opportunities for feature research. That is, several potential variables were not included in the study. Established theories founded on

previous research have provided guidance and justification for the study's proposed theoretical model. Furthermore, the data collected for this research might not be a solely applicable representation of the entire targeted research population, which looks to be an essential limitation of this study.

The many possible antecedents that influence tacit knowledge sharing described in the literature make it impractical to include them all. Consequently, normative continuance commitment constructs were not included in this research. Another limitation would be the uncertainty of efficiently capturing all demographics due to demographics' pollical sensitivity, such as gender discrimination and ethnicity. Accordingly, this research did not include any analysis of demographic characteristics.

Delimitations

It anticipates the need to implement delimitation to keep the study within the author's control in case the research experiences a low response rate. The research sample was adjusted for smaller populations utilizing Cochran's modified formula to control mitigation against the threat to instrument validity due to the low response rate and adequate research sampling. If that occurred, the research analysis would have generalized to the population according to the smaller population value modified by the formula (Chen & Chen, 2021).

Ethical Assurances

Regarding ethical purposes, Northcentral University rules and all rules and guidelines of participants' organizations have been adhered. Thus, the data collection processes would not start before the approval of the institutions' Institutional Review Board (IRB) and ethics committee. The research instrument highlighted participants' informed consent explained the research's purpose, and utilized the responses.

The consent portion provided prospective participants with information about the study's expectations. The section directed participants to voluntary participation and pointed to the opt-out option during the study without being penalized. The study revealed the absence of any known risks for participation.

Personally Identifiable Information (PII) was not collected to maintain research anonymity and confidentiality, and only research-relevant information was collected. Furthermore, the data in this study was set to be provided upon request for future studies to other researchers for independent interpretation of findings. Since the data was collected electronically, the responses were securely stored. The research data will be held for three years and discarded afterward.

Summary

Poor tacit knowledge sharing continues to be a problem among software developers in the mobile applications domain (Dogan & Dogan, 2020; Mtsweni & Maveterra, 2018); Mtsweni & Maveterra, 2019). The issue leads to low success in application development projects (Mtsweni & Maveterra, 2019; Shongwe, 2017). Furthermore, according to Sparkling and Dogra (2021), significant relationships exist between individuals' experience levels and dependence on tacit knowledge. Further, there was a strong correlation between knowledge acquisition and knowledge sharing (Zhou et al., 2020). That strengthens the importance of examining the moderating effects of moderating variables between study predictors and tacit knowledge capturing.

A structural mechanism based on organizational culture and social exchange factors that predict organizations' ability to capture developers' tacit knowledge was proposed to address this problem. This chapter presents the research methodology and design implemented to elicit the

information sorted by the research. A quantitative non-experimental method was employed, and the data were collected using a web-based online survey to gather completed responses from participants. The participants' responses were analyzed using the SEM's different statistical tests and techniques to examine linear causal relationships among observed and latent variables.

The proposed theoretical framework was established to predict organizational tacit knowledge ability based on five predictors in this research. The prediction relationships between administrative reward policies, regulation compliance, affective commitment behavior, and the capture of tacit knowledge are examined based on the significant effects of the defined programmers' categories. Additionally, the developers' experiences are examined as a moderator between the programmer's category's prediction relationship and the tacit knowledge capturing.

The research population includes the categories of junior, mid-level, and senior programmers as non-managers groups and manager-level programmers. The research maintained a minimum of 150 participants with various programming categories and years of experience. The SPSS was used for data prescreening and preparations. The MNAR, MAR, and MCAR methods were utilized to examine and address data missing values if they existed.

The SEM approach was employed to analyze the research data. The principal components analysis provided advanced alignment of the observed variables with their latent constructs through the rotating dataset axis based on the Varimax rotation feature. The Cronbach's alpha coefficient was used to ensure the reliability of the Likert scale's measurements. The next chapter illustrates the research analysis findings, results, and interpretations to address the research questions and test the study's hypotheses.

Chapter 4: Findings

Inadequate tacit knowledge sharing among team members significantly adversely affects the success of software development projects in the mobile applications domain (Adetunji, 2018; Mtsweni & Maveterra, 2018). This non-experimental quantitative correlation study aims to determine how organizational reward policies, regulation compliance, affective commitment, the programmer's category, and the number of experience years (EY) are predictive of tacit knowledge capture.

This quantitative research was centered on five research questions that stemmed from the study purpose and the theoretical framework based on organizational culture and social exchange factors. The research used a web-based survey hosted on the Qualtrics Survey Software platform. The study was examined through an online survey based on the research questions.

This chapter aims to present the results of tests of the research's preliminary and primary stages of the investigation. First, the results of the initial inquiry are reported. This phase concentrated on the survey instrument's analysis and validation. A principal component analysis (PCA) was conducted to subject the research survey instrument to a validity assessment as part of this stage.

The primary investigation results are presented, examining collected data through exploratory factor analysis and confirmatory factor analysis to assess the instrument's reliability. That was in addition to the convergent and discriminant validity. Then, the research structural equation model (SEM) was established, specified, and evaluated.

Validity and Reliability of the Data

This preliminary investigation conducted a principal component analysis with a Varimax rotation to ensure the constructs' validity and reliability. According to Chanu et al. (2021), the

PCA with Varimax rotation offers enhanced alignment of individual items associated with latent constructs by rotating the data set's axis. The first PCA result indicated that the loading value for the item RC_1 was low compared to the other things forming the regulation compliance (R.C.) construct.

The PCA ran the second time without including the RC_1. As a result, the cumulative variance explained by the four components improved from %65.135 % to 66.312, as in Table 4. Accordingly, the item was excluded from all further analyses in the research. Bollen (1990) indicated that all items' weights must exceed the 0.5 thresholds in the rotated component matrix. As highlighted in Table 4, items' weight values for each component's loading are above the recommended threshold, which indicates that the PCA results provided evidence of sufficient validity.

Based on Bagozzi and Yi's (1988) study, convergent validity was evaluated by considering the factor-loading aspects. As indicated in Table 5, all indicators were significantly loaded with their respective latent constructs. On the other hand, according to Bollen (1990), discriminant validity needs to be evaluated by examining cross-loading analysis results. Based on guidance from Straub et al.'s (2004) study, no construct items cross-loaded onto other constructs above the threshold of 0.40. Consequently, the scale items seemed to possess evidence of adequate convergent and discriminant validity.

The constructs' reliability measure, Cronbach's Alpha, was considered in this research. Scholars have no consensus regarding the minimum threshold for Cronbach's alpha reliability measure. Nunnally (1994) claimed that an acceptable level of reliability in the applied research domain is characterized by Cronbach's Alpha over 0.80. on the other hand, Tyler (1967) proposed a lower threshold level for construct reliability Cronbach's Alpha values of 0.75, as

shown in Table 4. The internal consistency coefficient was α=0.914 for regulation compliance, α=0.909 for tacit knowledge capture, α=0.890 for affective commitment, and α=0.884 for reward policies. These results suggest that all constructs have acceptable levels of internal consistency and were included in the primary analysis stage of the research.

Table 4

Rotated Component Matrix: Principal Component Analysis with Varimax Rotation

	Component					
	RC	**TKC**	**AC**	**RP**	Eigenvalue (% Variance)	Cronbach's Alpha
Regulation Compliance					11.988 (47.952)	.914
RC_5	.765	-.036	.209	.108		
RC_4	.757	.135	.209	.198		
RC_8	.733	.258	.147	.121		
RC_6	.666	.223	.158	.286		
RC_9	.665	.317	.218	.170		
RC_2	.660	.299	.126	.152		
RC_10	.644	.282	.355	.200		
RC_3	.631	.220	.223	.198		
RC_7	.628	.268	.145	.266		
Tacit Knowledge Capture					1.921 (7.683)	.909
TKC_2	.229	.753	.220	.277		
TKC_6	.120	.739	.202	.252		
TKC_3	.278	.729	.212	.217		
TKC_4	.228	.729	.317	.063		
TKC_5	.278	.717	.239	.150		
TKC_1	.298	.695	.320	.158		
Affective Commitment					1.447 (5.788)	.890
AC_4	.162	.201	.790	.197		

	Component					
	RC	**TKC**	**AC**	**RP**	Eigenvalue (% Variance)	Cronbach's Alpha
AC_5	.227	.326	.709	.115		
AC_3	.263	.143	.701	.278		
AC_1	.198	.248	.696	.200		
AC_6	.250	.313	.669	.103		
AC_2	.249	.255	.637	.307		
Reward Policies					1.222 (4.889)	.884
RP_2	.328	.242	.181	.785		
RP_1	.206	.251	.240	.759		
RP_3	.265	.207	.323	.731		
RP_4	.366	.205	.279	.651		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.
RC = Regulation Compliance; *TKC* = Tacit Knowledge Capture
RP = Reward Policies; *AC* = Affective Commitment

Results

After receiving an approval letter from NCU IRB (see Appendix A), research participants were given a consent letter (see Appendix B). The letter explains the purpose of the study, anonymity, safety measures, data handling procedures, and clarification of the voluntary nature of participation. Two organizations acquired site permissions (see Appendix C and Appendix D). IBM SPSS 27 and Amos 27 Graphics were utilized to analyze the data collected in the study.

The research sample was employees from representative mobile application software organizations. Employees from two software development organizations in the United States encompassed the potential sample pool. Employees and contractors classified as mobile software developers were selected for inclusion in the study. Those individuals were chosen regardless of

their roles in the organizations or their years of experience. The number of valid responses in the final dataset exceeded the minimum sample size of 150 estimated by a G*Power analysis (see Appendix E).

A total of 189 completed surveys were returned, and 179 were utilized in the study. Seven surveys were rejected because the response set was detected in the input. The response set is the tendency among respondents to answer survey questions independently of the contents of the questions (Andrich, 1978; Roberts, 1974). Three surveys were not accepted because their responders did not answer several survey questions, making it challenging to compute substitution values.

Participants were categorized according to their employment stratifications and the length of their experience as programmers. Each category was a separate variable comprising four groups. As shown in Table 5, programmers' stratification includes four groups: junior, mid-level, senior, and manager programmers. Similarly, the programmers' years of experience variable contains four groups: less than three years, between three and five years, between five and ten years, and more than ten years, as shown in Table 6. A total of 179 records were included in this analysis.

Table 5

Programmers' Stratifications Groups Statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior programmer.	45	25.1	25.1	25.1
	Mid-level programmer.	47	26.3	26.3	51.4
	Senior programmer.	42	23.5	23.5	74.9
	Manager programmer.	45	25.1	25.1	100.0

	Total	179	100.0	100.0	

Table 6

Programmers' Year of Experience Group Statistics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than three years.	48	26.8	26.8	26.8
	Between 3 and 5 years	44	24.6	24.6	51.4
	Between 5 and 10 years.	45	25.1	25.1	76.5
	More than ten years.	42	23.5	23.5	100.0
	Total	179	100.0	100.0	

Primary Investigation

The analysis results of this primary investigation stage are presented, starting with the research sample characteristics. A confirmatory factor analysis (CFA) was performed in this stage. In addition to, validity and reliability tests results were presented. Then, the structural model analysis results are interpreted using a hypotheses tests format.

The Measurement Model. The confirmatory factor analysis was conducted before the hypothesized paths analysis. According to Kelloway (1996), the utilization of structural equation modeling (SEM) in performing CFA is highly accepted. A precise analysis process is required to assess the validity and reliability of research instrument measures before applying structural model analysis (Anderson & Gerbing, 1988). The IBM Statistical Package for Social Sciences (SPSS) V.25 was utilized in this research's measurement and structural model analysis.

The processes of the CFA include five latent variables via 25 observable scale items (see Appendix G). The analysis of each construct had multiple points of validity. That was the

relationship between every scale item and its latent variable and the loading of those scale items and their associated error terms (Kelloway, 1996).

The CFA in this SEM model was achieved utilizing the maximum likelihood estimator (MLE). According to Maydeu-Olivares (2017), the MLE is widely used in SEM analysis and hinges on multivariate normality assumptions. Variables included in these investigations were tested for normality using normalized multivariate kurtosis values. As indicated in Table 7, the coefficients of the variables in the research were lower than the associated critical ratios, which displays data normality.

Table 7

Assessment of Normality

Variable	Kurtosis Value	Critical Ratio
RP_4	-.843	-2.302
RP_3	-.879	-2.400
RP_1	-.963	-2.630
RP_2	-.767	-2.096
AC_2	-.301	-.821
AC_6	-.291	-.794
AC_1	-.518	-1.415
AC_3	-.446	-1.217
AC_5	-.534	-1.457
AC_4	-.694	-1.896
TKC_1	-.546	-1.491
TKC_5	-.760	-2.074
TKC_4	-.291	-.794
TKC_3	-.614	-1.676
TKC_6	-.443	-1.210

Variable	Kurtosis Value	Critical Ratio
TKC_2	-.720	-1.966
RC_7	-.370	-1.011
RC_3	-.315	-.860
RC_10	-.525	-1.434
RC_2	-.499	-1.363
RC_9	-.614	-1.677
RC_6	-.482	-1.316
RC_8	-.504	-1.376
RC_4	-.271	-.740
RC_5	-.267	-.730
Multivariate	17.375	3.163

To define a good fit of the measurement model through the CFA and to assess the SEM model, the SPSS provides various overall goodness of fit indicators. Those indicators include chi-square good of fit (X2/df), root means squared error of residual (RMR), root means the square error of approximation (RMSEA), and the goodness-of-fit index (GFI). The CFA of the measurement model provides additional indicators by which the model's goodness of fit can be evaluated. The indicators include the adjusted goodness-of-fit index (AGFI), normed-fit index (NFI), and Comparative Fit Index (CFI).

According to Chin and Todd (1995), the fit indices, GFI, AGFI, NFI, and CFI, should exceed 0.90, RMSEA and RMR must be less than 0.08, and the chi-square should be insignificant. Additionally, the ratio of chi-square to degrees of freedom should be less than 5 (Ding et al., 1995; Howard, 2013). Chin and Todd (1995) claimed that measurement models that meet the above criteria acquire an excellent overall fit with the data collected.

The results of initial CFA indicated that the model revealed a poor goodness-of-fit (The ratio of χ 2/df = 1.285, p = .001; GFI = .954; AGFI = .954; NFI = .887; CFI = .972; RMSEA = .040; RMR = .102). According to Hermida (2015), a conventional approach to improve SEM's model fit was to examine the model modification indices for the proposed correlation among construct items' residual errors. However, establishing a correlation between error measurements to modify model fit may influence the path estimate and conceal the true model (Hermida, 2015).

On the other hand, the items deletion approach is widely utilized in SEM analysis research. Researchers frequently use factors' items loading and cross-loading values to decide whether the item must be deleted or retained (Worthington & Whittaker, 2006). Worthington and Whittaker (2006) added that unnecessarily keeping things that do not contribute meaningfully to their variables would cause difficulties in making final decisions regarding the number of factors included. Accordingly, item deletion was the approach adopted in this research.

The correlation among construct items' residual errors and items deletion was employed in this research to obtain an acceptable good model fit; the RC2, RC3, RC5, RC6, RC7, TKC4, TKC6, AC1, and AC6 were removed from the model due to model fit discrepancies of inflating the chi-square value. Further, correlations among residual errors were established between e2-e10 and e23-e25 (see Appendix H). After modifying the model (Hermida, 2015; Worthington & Whittaker, 2006), a satisfactory model fit was reached (The ratio of χ 2/df = .894, p = .001; GFI = 1.000; AGFI = .929; NFI = .956; CFI = 1.000; RMSEA = .000; RMR = .079; Default model Standardized RMR = .0317).

Measurement Model Validity and Reliability. The standardized RMR (Standardized Root Mean Square Residual) test was utilized to examine the model's validity and reliability. AMOS Standardized RMR plugin was used to generate Table 8. As shown in Table 8, thresholds

of composite reliability (C.R.) and average variance extracted (AVE) are above .7 and .5, respectively (Hu & Bentler, 1999).

According to Hu and Bentler (1999), the square root of the AVE on the diagonal must be higher than the value of the constructs' correlation (Hu & Bentler, 1999). Hu and Bentler also stated that the three stars associated with correlation values indicate that they are significant, with a p-value less than 0.001. The discriminant validity was examined by verifying that the AVE of research factors was higher than the inter-factor correlation and by inspecting that the maximum shared variance (MSV) was lower than the AVE for all aspects (Hair, 2011).

Table 8

Standardized RMR Test: Model Validity Measures

	CR	AVE	MSV	MaxR(H)	RC	TKC	AC	RP
RC	0.865	0.617	0.514	0.872	**0.786**			
TKC	0.883	0.655	0.519	0.886	0.717***	**0.809**		
AC	0.852	0.590	0.527	0.854	0.702***	0.720***	**0.768**	
RP	0.893	0.676	0.527	0.895	0.693***	0.681***	0.726***	**0.822**

*** indicates that the construct correlation value was significant with a p-value less than 0.001

A configural invariance test was performed to check whether the CFA factor structure achieves a good fit across all groups when tested freely (Hong et al., 2003). Two sets of groups experienced separate configural invariance tests. The first group includes programmers' stratification levels: junior, mid-level, senior, and manager programmers. The other set comprises programmers' experience in years: less than three years, between 3 and 5 years, between 5 and 10 years, and more than ten years.

The unconstrained model with programmers' stratification groups reflected good model fit (ratio of χ 2/df = 1.794, p = .061; GFI = .950; AGFI = .909; NFI = .951; CFI = .901; RMSEA = .060; RMR = .079). On the other hand, the unconstrained model with programmers' stratification groups reflected good model fit (ratio of χ 2/df = 2.094, p = .067; GFI = .930; AGFI = .911; NFI = .941; CFI = .921; RMSEA = .070; RMR = .071).

Those results indicate that the model meets the requirements of configural invariance. Metric invariance was good, as evidenced by demonstrating non-significant chi-square tests among the unconstrained and fully constrained models as regression weights were constrained. However, the scalar invariance test was not performed because comparing the means of measures across the group was not included in the research.

The measurement model dominated evidence of sufficient reliability, validity, and goodness of fit. Accordingly, the three original predictors were retained to operationalize the tacit knowledge capture (TKC) in the path model. Therefore, the four constructs with four scales for each were included in the subsequent structural model testing.

The Structural Model. After assessing the model's latent constructs and their items in Figure 4.3, the analysis of the proposed relationships among variables was investigated. The structural equation model illustrated in chapter 1 was analyzed utilizing Amos 27. The chi-square assessed the model's latent constructs and their items in Figure 4.3, and the analysis of the proposed relationships among variables was investigated. The structural equation model illustrated in chapter 1 was analyzed utilizing Amos 27. The chi-square was insignificant with a *p*-value = .248, which was above the threshold of .05 (Nevitt & Hancock, 1998). The ratio of $\chi 2/df = 1.093$, below the threshold of 5 (Nevitt & Hancock, 1998).

The RMSEA and RMR values were .023 and .078, respectively, well below the threshold of 0.08 (Hu & Bentler, 1998). Further, the GFI, AGFI, and NFI values were .933, .908, and .940; and were all above the .9 threshold (Bentler & Bonett, 1980). Accordingly, the overall goodness-of-fit statistical analysis indicates a satisfactory overall model fit.

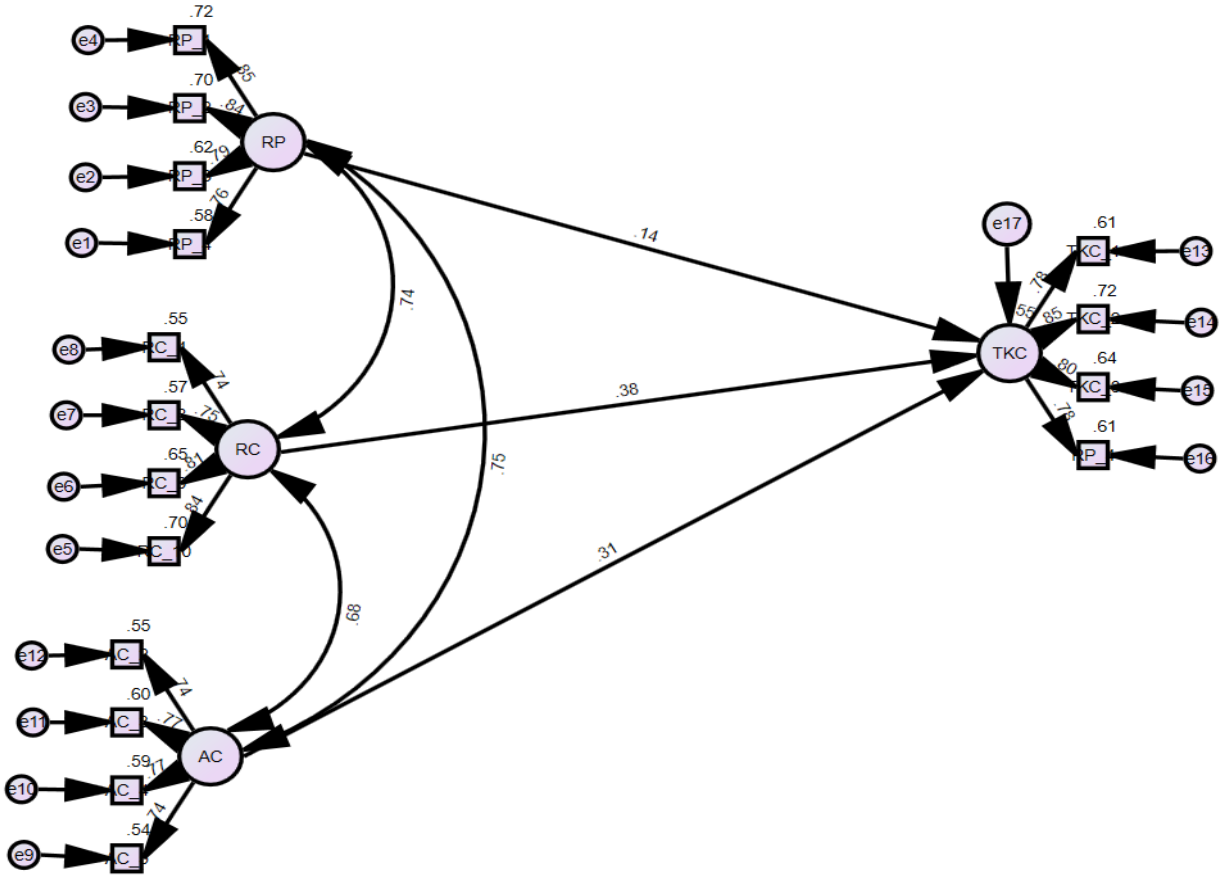

Figure 2. Structural Model Final: Factor loading, latent variables, square multiple correlation values, and standardized path estimates.

The initial unconstrained structural model path analysis indicated significant regression weights relationships between the latent and implicit knowledge variables, as shown in Table 9. The TKC <--- Regulation Compliance path was statistically significant (p = .002), the

The TKC<--- Reward Policies path was statistically significant (p = .045), and the TKC <--- Reward Policies path was statistically significant (p = .036). Table 9 shows the estimated standardized regression weight values for each way.

Table 9

Regression Weights Default Model

Path	Estimate	S.E.	C.R.	P
TKC <--- Regulation Compliance	.297	.098	3.031	.002
TKC <--- Reward Policies	.228	.161	1.823	.045
TKC <--- Affective commitment	.497	.237	2.099	.036

TKC = Tacit Knowledge Capture
(A <--- B) indicates the regression weight for paths B to A

Table 10

Standardized Regression Weights Default Model

	Estimate
Tacit Knowledge Capture <--- Regulation Compliance	.291
Tacit Knowledge Capture <--- Reward Policies	.299
Tacit Knowledge Capture <--- Affective Commitment	.377

(A <--- B) indicates the regression weight for paths B to A.

Table 11

Research Structural Model: Overall Fit Standard

Statistical Criteria	Structural Model Result Value	Threshold Value	References
Chi-Square Significance	p-value = .248	Non-significant	Nevitt and Hancock (1998)
the ratio of χ 2/df	1.093	≤ 5	(Nevitt & Hancock, 1998)
Root Mean Square Error of Approximation (RMSEA)	.023	≤ 0.08	Hu and Bentler (1998)
Goodness of Fit Index (GFI)	.933	≥ 0.90	Bentler and Bonett (1980)
Adjusted Goodness of Fit Index (AGFI)	.908	≥ 0.90	Bentler and Bonett (1980)
Normed Fit Index (NFI)	.940	≥ 0.90	Bentler and Bonett (1980)
Standardized Root Mean Square Residual (RMR)	0.08	≤ 0.08	(Hu & Bentler, 1998)

Multi-group Structural Equation Modeling Analysis. The testing of the five hypotheses in this research includes examining the moderating effects of two different group variables on the relationships among latent variables. Those two categorical variables are the programmer stratification levels (PLVL) and the programmers' levels of experience (EXP). Table 5 indicate skewed distribution towards the mid-level programmers' stratification group.

Similarly, Table 6 shows uneven distribution among the group of programmers with less than three years of experience.

Accordingly, recommendations were adopted by Deng et al. (2005) and Steenkamp and Baumgartner (1998) in regrouping the categorical variables into two groups instead of four for each variable. For the programmer stratification variable, junior and mid-level programmer groups were combined into a “Low Rank” group. Similarly, senior and manager programmer groups were combined into a “High Rank” group. For the EXP variable, the “less than three years” and “between 3 and 5 years” were combined into a “Low Exp” group. Alike, the “Between 5 and 10 years” and “more than ten years” groups were incorporated into the “High Exp” group.

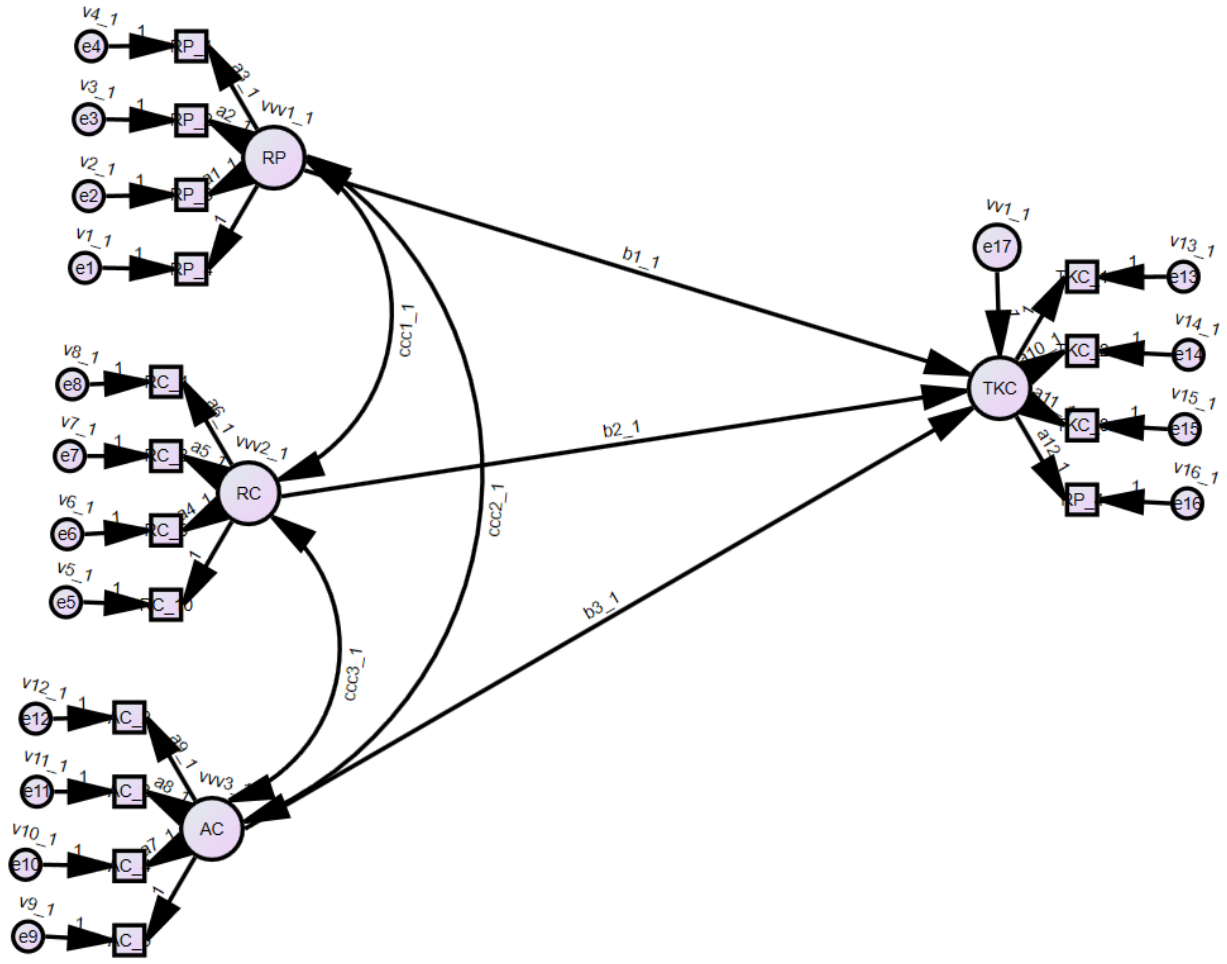

Figure 3. Structural Equation Model Multiple Group Analysis

The next step was to test the structural model in Figure 4.4 using responses from (a) a low-rank group of 92 individuals and (b) a high-rank group of 87 individuals. Testing this model was directed to examining hypotheses H1, H2, H3, and H5. Hypothesis H1, H2, and H3 were tested to investigate the moderating effects of programmers' stratification of two groups in predicting one or more of the three independent variables' ability to predict the tacit knowledge capture. At the same time, H5 was tested to examine the moderating effect of programmers' stratification of two groups in predicting the ability of the three independent variables combined in predicting the tacit knowledge capture.

Amos 27 multiple-group analysis feature was utilized to examine the structural equation model to compare unconstrained and structural weights models. In the unconstrained model, all parameters were computed freely without constraints. On the other hand, in the model of the structural weight, there was no difference between the LowRank and HighRank groups concerning the relationships between independent and dependent variables.

As depicted in Figure 4.4, b1 represents the path value of the relationship between R.P. and TKC; b2 represents the path value of the relationship between R.C. and TKC; b3 represents the path value of the relationship between A.C. and TKC.

Table 12

Constrained and Unconstrained Models Comparisons

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural weights	15	31.362	.008	.025	.030	.015	.018

As indicated in table 12, the difference between the constrained and unconstrained showed that the constrained model comparison had a chi-square of 31.362, which was significant ($p < .05$). Three constrained models, b1, b2, and b3, were computed to examine the paths between the three independent variables and the TKS, as depicted in Table 13. Paths TKC<---RP and TKC<---RC were statistically significant with chi-square values of 1.988 ($p = .041$) and chi-square values of 2.953 ($p = 026$) respectively. However, the TKC<---AC path did not have a statistically significant chi-square value of .845 ($p = .358$).

Table 13

Model Paths Constrained and Unconstrained Models Comparisons

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural weights	15	31.362	.008	.025	.030	.015	.018
b1	1	1.988	.041	.002	.002	.001	.001
b2	1	2.953	.026	.002	.003	.002	.002
b3	1	.845	.358	.001	.001	.000	.000

The regression weights analysis results were checked to determine whether the differences among the two groups for each path were statistically significant. For the low-rank group, paths TKC<---RP and TKC<---RC were statistically significant with *Estimate* values of .946 (p = .002) and *Estimate* values of 2.953 (p = .042) respectively. However, the TKC<---AC path did not have a statistically significant *Estimate* value of .073 (p = .277), as depicted in Table 14. While paths RP-TKC and RC-TKC were statistically significant with *Estimate* values of -.068 (p = .027) and *Estimate* values of .652 (p = .000) respectively. However, the TKC<---AC path was not statistically significant *Estimate* value of .256 (p = .174) is shown in Table 15.

Table 14

Regression Weights: LowRank- Unconstrained

	Estimate	S.E.	C.R.	P	Label
TKC <--- Reward Policies	.946	.872	4.085	.002	b1_1
TKC <--- Regulations Compliance	.743	.246	3.299	.042	b2_1
TKC <--- Affective Commitment	.073	.915	1.088	.277	b3_1

Table 15

Regression Weights: HighRank- Unconstrained

	Estimate	S.E.	C.R.	P	Label
TKC <--- Reward Policies	-.068	.196	0.549	.027	b1_2
TKC <--- Regulations Compliance	.652	.176	3.699	***	b2_2
TKC <--- Affective Commitment	.256	.188	1.360	.174	b3_2

TKS = Tacit Knowledge Capture

Hypothesis H4 concerns the moderating effects of programmers' experience groups on the relationship between the stratification levels of programmers and the TKC. A separate model was built to test this hypothesis to illustrate the relationship between the programmer's experience as an observed variable and TKC as a latent variable. Figure 4.5 shows the path parameters value of the relationship. The unconstrained standardized model comprising the relationship between EXP and TKC reflected good model fit (ratio of χ 2/df = 2.890, p = .050; GFI = .968; AGFI = .904; NFI = .966; CFI = .977; RMSEA = .071; RMR = .080). Table 16 shows the regression weights *estimate* for a path between the EXP and TKC.

Table 16

Maximum Likelihood regression Weights

	Estimate	S.E.	C.R.	P	Label
Tacit Knowledge Capture <--- P_Experience	-.449	.071	-6.314	***	

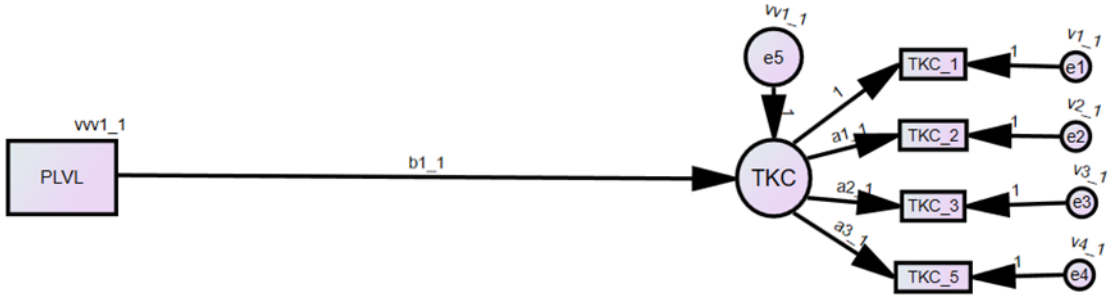

Figure 4. Path Test Between Programmer's Experience and TKC

As indicated in table 17, the difference between the constrained and unconstrained showed that the constrained model comparison had a chi-square of 28.942, which was significant ($p < .05$). One constrained model, b1, was computed to examine the paths between the PLVL and the TKS, as depicted in Table 18. Paths TKC<---RP was statistically significant with chi-square values of 2.985 ($p = .021$).

Table 17

Constrained and Unconstrained Models Comparisons

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural weights	13	28.942	.003	.035	.040	.014	.015

Table 18

Model Paths Constrained and Unconstrained Models Comparisons

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural weights	13	28.942	.003	.035	.040	.014	.013
b1	1	2.985	.021	.002	.002	.001	.001

The regression weights analysis results were checked to determine whether the differences among the two groups for each path were statistically significant. For the LowExp group, Table 19 indicates that the way PLVL-TKC was statistically significant with an *Estimate*d 708 (p = .013). For the HighExp group, Table 20 showed that the way PLVL-TKC was statistically significant with an *Estimate* value of -.512 (p < .001).

Table 19

Regression Weights: LowExp- Unconstrained

	Estimate	S.E.	C.R.	P	Label
Tacit Knowledge Capture <--- PLVL	.708	.863	4.166	.013	b1_1

Table 20

Regression Weights: HighExp- Unconstrained

Path	Estimate	S.E.	C.R.	P	Label
Tacit Knowledge Capture <--- PLVL	-.512	.476	3.497	***	b1_2

Research Question 1/Hypothesis 1

RQ1. To what extent, if any, does the organizational reward policy affect the tacit knowledge capture in the mobile applications development domain?

$H1_0$.The organizational reward policy, alone or combined with other factors, does not significantly affect the tacit knowledge capture of the mobile applications development based on the programmer's category.

$H1_a$. The organizational reward policy, alone combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category.

The SEM multiple groups path analysis tests indicated significant direct effects of reward policies (R.P.) on the tacit knowledge capture (TKC) with *chi-square* values of 1.988 (p = .041). Further, the regression weights comparison between the LowRank and the HighRank groups showed significant differences between the two groups regarding the effect of the R.P. on the TKC. As shown in Table 9, the LowRank regression weights estimate was .946 (p = .002, *C.R.* = 4.085, *S.E.* = .872). While the HighRank regression weights estimate was -.068 (p = .027, *C.R.* = 0.549, *S.E.* = .196) as indicated in Table 10.

Consequently, the null hypothesis ($H1_0$) was rejected. The above results provided sufficient evidence to support the alternative hypothesis ($H1_1$). Therefore, based on the

programmer's category, the organizational reward policy significantly affects the tacit knowledge capture in mobile application development.

Research Question 2/Hypothesis 2

RQ2. To what extent, if any, does the employee affective commitment affect the tacit knowledge capture in the mobile applications development domain?

$H2_0$. The employee affective commitment, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category.

$H2_a$. The employee affective organizational commitment, alone or combined with other factors, significantly affects the tacit knowledge capture in the mobile applications development based on the programmer's category**.**

The SEM multiple groups path analysis tests did not indicate significant direct effects of affective commitment (A.C.) on the tacit knowledge capture (TKC) with a *chi-square* value of .073 (p = .277). Further, the regression weights comparison between the LowRank and the HighRank groups did not reflect significant differences between the two groups regarding the effect of the A.C. on the TKC. As shown in Table 9, the LowRank regression weights estimate was .073 (p = .277, *C.R.* = 1.088, *S.E.* = .915). While the HighRank regression weights estimate was .256 (p = .174, *C.R.* = 1.360, *S.E.* = .188) as indicated in Table 10.

Consequently, the null hypothesis ($H2_0$) could not be rejected. Therefore, the employee affective commitment does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category.

Research Question 3/Hypothesis 3

RQ3. To what extent, if any, does organizational regulation compliance affect the tacit knowledge capture in the mobile applications development domain?

$H3_0$. The organizational regulation compliance, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category.

$H3_a$. Organizational regulation compliance, alone or combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category.

The SEM multiple groups path analysis tests indicated significant direct effects of regulations compliance (R.C.) on the tacit knowledge capture (TKC) with a *chi-square* value of 2.953 (p = .026). Further, the regression weights comparison between the LowRank and the HighRank groups showed significant differences between the two groups regarding the effect of the R.C. on the TKC. As shown in Table 9, the LowRank regression weights estimate was .743 (p = .042, *C.R.* = 3.299, *S.E.* = .246). While the HighRank regression weights estimate was .652 (p = ***, *C.R.* = 3.699, *S.E.* = .176) as indicated in Table 10.

Consequently, the null hypothesis ($H3_0$) was rejected. The above results provided sufficient evidence to support the alternative hypothesis ($H3_1$). Therefore, employee regulation compliance significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category.

Research Question 4/Hypothesis 4

RQ4. To what extent, if any, does the programmer's years of experience moderate the relationships between tacit knowledge capturing and programmer's category?

$H4_0$. Programmers' years of experience do not moderate the relationships between tacit knowledge capturing and the programmer's category.

$H4_a$. A programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category.

The SEM multiple groups path analysis tests indicated significant direct effects of programmers' stratifications level (PLVL) on the tacit knowledge capture (TKC) with a *chi-square* value of 2.985 (p = .021), as shown in Table 18. Further, the regression weights comparison between the LowExp and the HighExp groups reflected significant differences between the two groups regarding the effect of the PLVL on the TKC. As shown in Table 18, the LowExp regression weights estimate was .708 (p = .013, *C.R.* = 4.166, *S.E.* = .863). While the HighExp regression weights estimate was -.512 (p = ***, *C.R.* = 3.497, *S.E.* = .476) as indicated in Table 20.

Consequently, the null hypothesis ($H4_0$) was rejected. The above results provided sufficient evidence to support the alternative hypothesis ($H4_1$). Therefore, the programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category.

Research Question 5/Hypothesis 5

RQ5. To what extent, if any, does the programmer's category moderate the relationships between tacit knowledge capturing, organizational reward, regulation compliance, and affective commitment predictors?

$H5_0$. The programmer's category does not moderate the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

$H5_a$. Programmer's category moderates the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

The SEM multiple groups path analysis tests did not indicate a significant direction of the combined three independent variables (R.P., P.C., and A.C.) and the TKC. The difference between the constrained and unconstrained showed that the constrained model comparison had a chi-square of 31.362, which was significant ($p < .05$), as indicated in table 12. Three constrained models, b1, b2, and b3 were computed to examine the paths between the three independent variables and the TKS, as depicted in Table 10. Paths TKC<---RP and TKC<---RC were statistically significant with *chi-square* values of 1.988 ($p = .041$) and chi-square values of 2.953 ($p = 026$) respectively. However, the TKC<---AC path did not have a statistically significant chi-square value of .845 ($p = .358$).

Consequently, the null hypothesis ($H5_0$) could not be rejected. Therefore, the programmer's category does not moderate the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors.

Evaluation of the Findings

This research study leveraged the organizational culture and social exchange theories to examine the potential influence of a programmer's affective commitment, the organization's reward policies, regulations attitude, programmer stratification, and experience on tacit knowledge sharing. The study showed a significant direct effect of reward policies and affective commitment on tacit knowledge capture based on the programmer's category. Further, the study indicated that organizational regulation compliance does not significantly affect the tacit knowledge capture based on the programmer's variety.

Furthermore, the study indicated that the programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category. Additionally, the study analysis revealed that the programmer's class does not intervene in the relationships between implicit knowledge charging and organizational reward, regulation compliance, and affective commitment predictors. These results were discussed in light of the study research and theoretical framework.

Research Question 1/Hypothesis 1

The results from the SEM multigroup analysis indicate a significant positive relationship between reward policies and tacit knowledge capture among low-ranked programmers. However, the results show a negative relationship between reward policies and tacit knowledge capture among high-ranked programmers. These outcomes implied substantial differences among the levels of programmers on the relationship between organizational rewards approaches and tacit knowledge capture.

This finding helped further affirm the argument that the lack of organizational reward systems negatively influences knowledge transfer (Nengomasha et al., 2017). This positive effect also matched the findings of other corporate culture and social exchange theories-based studies, including Rehman et al. (2021) and Garrick and Chan (2017).

However, Askarinejad and Elham (2019) found that incentives did not significantly affect implicit knowledge sharing. Askarinejad and Elham studied the relationships in the context of a relationship between social capital and the tendency to share explicit and tacit knowledge. The rationale for these contracts might be that the investigation was conducted in a different theoretical setting.

Research Question 2/Hypothesis 2

The results from the SEM multigroup analysis indicate an insignificant relationship between the affective commitment variable and tacit knowledge capture among low-ranked and high-ranked programmers. This result matched the findings of Yuan and Ma's (2022) study; however, Yuan and Ma studied the mediation effects of gender instead of employee stratifications regarding the relationship between affective commitment and tacit knowledge capture. The findings of Cugueró-Escofet et al. (2019), Ouakouak and Ouedraogo (2019), and Pu et al.'s (2022) studies were based on organizational culture theoretical frameworks that emphasized the importance of managers' role in enhancing the relationship between affective commitment and tacit knowledge capture among other employees' stratification.

Research Question 3/Hypothesis 3

The results from the SEM multigroup analysis indicate a significant positive relationship between regulation compliance and tacit knowledge capture among low-ranked and high-ranked programmers. This outcome implied a considerable correlation between employees' regulation compliance attitude and tacit knowledge capture. This finding was consistent with Page's (2017) and Shihabeldeen et al.'s (2020) studies, which are organizational culture-based and claim a significant association between an individual's compliance attitude and tacit knowledge sharing.

Conversely, this finding did not concur with Kwanya and Wasinda (2019). Kwanya and Wasinda also claimed that only organizational culture and leadership significantly influenced tacit knowledge sharing and diffusion. The rationale for this contrast might be that investigation was conducted in different contexts that examined only the leaders of the organizations, and lower levels of employees were excluded.

Research Question 4/Hypothesis 4

The results from the SEM multigroup analysis indicate a significant, influential effect on the programmer's level of experience as a moderator in the relationships between tacit knowledge capturing and the programmer's category. This result further supports the findings of Saini et al. (2018), Sparkling and Dogra (2021), and Tahir et al. (2021) organizational culture-based research of relationships among employees' rank, employee experience level, and tacit knowledge capture.

However, Peng et al. (2021) conveyed different organizational culture and social exchange-based studies that indicated conflicting significant effects depending on the nature of experience. Peng et al. showed that unified experience has other consequences on knowledge-capturing processes. Positive experiences lead to a positive attitude toward knowledge sharing, while competitive experiences lead to knowledge-hiding behavior (Peng et al., 2021).

Research Question 5/Hypothesis 5

The results from the SEM multigroup analysis indicate an insignificant moderating effect in the relationship between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors. This outcome implied that programmers' stratifications did not influence the relationship between the combined independent variables (corporate compensation, regulation compliance, and affective commitment) and the tacit knowledge capture. Additionally, the high-ranked programmers' group negatively influences the relationship between administrative reward policies and tacit knowledge capture.

The scientific community has highly debated the role of those independent variables in predicting tacit knowledge capturing. Little was known about the influence of the combined variables on the inferential knowledge-capturing processes. Some researchers contend the link

between organizational reward policies, employee stratifications, commitment, and tacit knowledge capture (Ahmed, 2020; De Grandis, 2020; Nguyen, 2020). The Askarinejad and Elham (2019) and Nelufule (2021) studies indicated a negligible influence of reward policies on tacit knowledge capturing. Generally, reviewed literature did not demonstrate evidence of a significant effect of the combined variables on tacit knowledge capturing.

Summary

This quantitative non-experimental correlation research aimed to determine the extent to which organizational reward policies, regulation compliance, affective commitment, the programmer's category, and the number of experience years are predictive of tacit knowledge capture. The corporate culture and social exchange theories served as the theoretical lens that guided this study. The anonymous online survey presented in Appendix F was established and served as a research study instrument. Data from 179 mobile application developers were analyzed using the structural equation modeling technique.

Principal component analysis with a Varimax rotation was used to ensure instrument constructs' validity and reliability. Further, before applying the structural research modeling, confirmatory factor analysis was conducted to examine the constructs' multiple points of truth. The maximum likelihood estimator was used to investigate the variables' data normality. The measurement model was tested for goodness-of-fit after the execution of various items.

Measurement model validity and reliability were examined by performing composite reliability, and the average variance extracted was used to examine the discriminant validity. Due to the inclusion of groups in the analysis, a configural invariance test was performed to ensure the measurement model maintained a good fit across all groups. Participants were categorized according to their employment stratifications and the length of their experience as programmers.

The structural research model was applied following those tests utilizing IBM SPSS 27 and Amos 27 Graphics.

A multigroup SEM based on the maximum estimation likelihood was utilized to conduct the analysis. Due to the skewed distribution among the categorical groups, the grouping variables were further categorized into two instead of four for each variable. Programmers' stratifications included low-rank and high-rank groups, and the length of experience variable was categorized into low-exp and high-exp groups.

The multigroup SEM based on the maximum likelihood of estimating was utilized to compare unconstrained and structural weights models. The path relationships among the three independent variables and tacit knowledge capture variables were tested using a constrained model for each path. The paths between reward policies-tacit knowledge capture and regulation compliance-tacit knowledge capture were statistically significant among programmers' stratification groups.

While the path of affective commitment-tacit knowledge capture was not statistically significant among the groups, the regression weights analysis estimates for the programmers' high-rank group indicated a negative effect on the reward policies-tacit knowledge capture. Separate group analysis was established to test H5 for programmer stratification-tacit knowledge capture.

The study results supported the rejection of the null hypothesis associated with research questions 1, 3, and 4. Conversely, the statistical analysis did not yield sufficient evidence for dismissing the null hypothesis related to research questions 2 and 5. For research question 1, the organizational reward policy significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category. For research question 3,

employee regulation compliance significantly affects the tacit knowledge capture in mobile applications development based on the programmer's type. For research question 4, the programmer's years of experience moderate the relationships between tacit knowledge capturing and the programmer's category.

The results of the SEM maximum likelihood estimator analysis showed that the multivariate normality assumptions were met. The reliability of the survey instrument constructs was measured, and Cronbach's alpha scores were higher than the .70 threshold. The theoretical research model showed enough evidence to test the hypothesis.

In this research, the null hypothesis $H2_0$ and the null hypothesis $H5_0$ were rejected. For research question 2, the employee affective commitment does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category. For research question 5, the programmer's classification does not moderate the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors. Finally, research implications, recommendations, and pathways for more substantial future research on the subject are discussed in detail in chapter 5.

Chapter 5: Implications, Recommendations, and Conclusions

This quantitative study examined the influence of mobile applications developer work attitudes and organizational culture factors' ability to predict the processes of tacit knowledge capturing in that domain. The sharing and capturing of tacit knowledge play a crucial role in businesses' and individuals' advancement. Matshwane et al. (2019) argued that organizational culture and social exchange among individuals significantly influence how individuals interact and think, understand how knowledge was captured and created, and disseminate knowledge. Further, the poor capture of tacit knowledge leads to inadequate service delivery and overall organizational performance (Bonomi et al., 2020).

Understanding potential factors that influence tacit knowledge sharing is crucial in addressing software development workplace shortfalls. Mtsweni and Mavetera (2019) claimed that 60% of projects fail due to inadequate implicit knowledge sharing among developers. This research aimed to create structural mechanisms based on organizational culture and social exchange factors that predict organizations' ability to capture developers' tacit knowledge.

A theoretical model based on organizational culture and social exchange theories (OCT and SET) served as the theoretical lens that guided this research. The corporate culture theoretical bases refer to the extent to which employees are willing to share typical desires, aspirations, and commitments to work together (Evans & Smokowski, 2016; Hambrick & Wowak, 2021). According to Marin and Pereschica (2017), the OCT emphasizes the importance of organizational components such as actions, perspective, and interpretations to understand better general behavior and changes.

This quantitative correlation research examined the relationships between capturing tacit knowledge and mobile software developers' attitude based on organizational cultures. In this

research, a non-experimental research methodology was adopted. The adapted methods do not require direct manipulation of variables to evaluate interactions (Ciotti et al., 2019; Roberts, 2020).

This research specifically sought to clarify the extent to which the reward policies, regulation compliances, and affective commitment influence the prediction of tacit organizational knowledge capturing. The tacit knowledge capture constructs served solely as an endogenous or dependent factor. While reward policies, regulation compliances, and affective commitment served as exogenous predictor variables.

The targeted population for this research study was software developers in the mobile application domain in the United States of America. The research sample was acquired from different mobile applications organizations (see Appendix C and D). a G*Power analysis estimated a minimum sample size of 150 for the data analysis, which involved structural equation modeling (SEM) methods (Abd-El-Fattah, 2010; Lin, 2021; Sarstedt et al., 2020).

Participants were notified by email distributed by organizations' representatives and completed a one-time closed-ended anonymous online survey. Data were collected in May 2022. The research data was collected from the OCT and SET constructs questions. The questions were based on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree) (Dyck & Wiebe, 2012; Martin, 2018).

The maximum likelihood of estimator (MLE) and multigroup structural equation modeling was utilized to analyze the relationship between the OCT and SET's reward policies, regulation compliance, affective commitment, tacit knowledge capture, programmer stratification, and programmer experience variables. All latent variables included in the study were examined for normality because the MLE method was pivoted on multivariate normality

assumptions (Maydeu-Olivares, 2017). The result of the normality test indicated sufficient evidence of data normality. The SEM multigroup analysis was utilized to compare differences among constrained and unconstrained models for each categorical variable.

The MLE-SEM and SEM multigroup models indicated that reward policy and regulation compliance maintained significant relationships with tacit knowledge capture for both programmers' stratification groups. These results matched the findings of Garrick and Chan (2017), Nengomasha et al. (2017), Page (2017), and Rehman et al. (2021). At the same time, the affective commitment construct indicated an insignificant relationship with the tacit knowledge capture. These results draw a parallel with the findings of Cugueró-Escofet et al. (2019), Ouakouak and Ouedraogo (2019), and Pu et al. (2022), which showed the importance of high-rank employees in enhancing that relationship.

On the other hand, the study results indicate that the programmer's experience level moderated the relationships between tacit knowledge capturing and the programmer's category. This finding was further supported by Saini et al. (2018), Sparkling and Dogra (2021), and Tahir et al. (2021), which depicted a strong influence on the employee experience on the relationship between employees' stratification and tacit knowledge capture. Furthermore, the SEM multigroup analysis showed an insignificant moderating effect in the relationship between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors. The reviewed literature did not indicate evidence of a significant effect of the combined variables on tacit knowledge capturing. The analysis results were used to formulate and present the study implementation, recommendations for practices, future research, and conclusions.

Implications

Previous research indicated that failing to share implicit knowledge among mobile application developers significantly adversely affects overall organizational performance (Bonomi et al., 2020). Tacit knowledge sharing is crucial for business success as it accounts for 36.2% of corporate innovation speed and 32.1% of innovation quality (Dogan & Dogan, 2020). Current literature indicated various approaches adopted by researchers to address the problem related to knowledge sharing.

The extant investigations on the topic have concentrated on studying extrinsic and intrinsic factors that influence the knowledge-sharing process (Balle et al., 2018; Chen et al., 2018; Khoza & Pretorius, 2017). A few investigations focused on the issue of sharing tacit knowledge as an isolated human-related issue (Buunk et al., 2019; Kakar, 2018; Khoza, 2019; Rosa et al., 2016). Other investigations approached the case as an organizational knowledge management failing processes influencing tacit knowledge. However, little analytical work has been achieved on the issues of corporate culture and social exchange influencing programmers' behavior.

Therefore, the focus of this investigation was examining factors that influence capturing and sharing tacit knowledge actions in the workplace, which could help organizations acquire advanced management methods and enhance performance. Such processes require gaining a better understanding of how tacit knowledge is captured. This research examined the influence of organizational culture and social exchange factors in tacit knowledge capturing. Understanding the predictors of tacit knowledge capturing at the workplace would enable private and public organizations to invent and implement sound strategies, regulations, policies, and work procedures that effectively and systematically capture developers' tacit knowledge.

The research findings have vital theoretical and practical implications. From an academic standpoint, the study's empirical evidence revealed that the research model is suitable for studying the determinants of tacit knowledge capturing. Further, the model utilized in this research accounted for 66.3% of the variance in the dependent variable. From a practical viewpoint, the research results offer scholars and practitioners critical insight into comprehending the major derive of explicit knowledge capture and potentially accelerating the knowledge-sharing rate among employees.

Ever since the establishment of the organizational culture and social exchange theories, researchers have demonstrated that they are a valuable basis for establishing factors that influence individuals' behavior regarding knowledge transfer, such as software development (Janićijević Nebojša, 2015), information and communication technologies (Yang & Chen, 2020; Zhang et al., 2018), and knowledge management systems (Matshwane et al., 2019). In this investigation, the examined variables in the theoretical framework represented a satisfactory level of validity and reliability throughout the analysis.

Furthermore, the indices were within the acceptable ranges that were set as thresholds: the benchmark of Cronbach's alpha coefficient ($0.6 < \alpha < 0.8$) (dos Santos Barros et al., 2021); AVE higher than .5 greater than .5 (dos Santos & Cirillo, 2021); composite reliability higher than .7 (Hu & Bentler, 1999); the ratio of Chi-square to degrees of freedom (X2/df) less than 5 (Nevitt & Hancock, 1998); GFI greater than 0.90 (Bentler and Bonett, (1980); AGFI greater than 0.90 (Bentler and Bonett, (1980); NFI greater than 0.90 (Bentler and Bonett, (1980); RMSEA less than 0.08 (Hu & Bentler, 1998); and RMR less than 0.08 (Hu & Bentler, 1998). Consequently, this investigation adds empirical evidence to the literature by studying the competence and soundness of the presented theoretical model, which was formed in a workplace setting.

This investigation concentrated on five research questions to explore respondents' perceptions of factors influencing programmers' attitudes toward tacit knowledge sharing. The research findings draw attention to three key aspects: (1) enabling components that should exist to encourage tacit knowledge sharing, (2) improving organizational ability to establish effective knowledge management systems, and (3) enhancing the understanding of individuals' perceptions regarding the tacit knowledge sharing based on employment stratification and length of their experience. Next, the findings and implications of each research question are explained.

Research Question 1/Hypothesis 1

RQ1. To what extent, if any, does the organizational reward policy affect the tacit knowledge capture in the mobile applications development domain? This question presented the following null ($H1_0$) and alternative ($H1_a$) hypotheses: *$H1_0$*. The organizational reward policy, alone or combined with other factors, does not significantly affect the tacit knowledge capture of the mobile applications development based on the programmer's category. $H1_a$. The organizational reward policy, alone combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category.

Results in the SEM analysis found a significant effect of organizational reward policies on capturing programmers' tacit knowledge; thus, the null hypothesis was rejected. However, there were differences influenced by the programmers' stratifications. There was a significant positive relationship for the low-rank group, while the high-rank group was associated with an essential negative relationship. This outcome suggests that a reward policy encourages low-rank programmers to share their knowledge. While interestingly, it discourages individuals within the high-rank group from sharing their tacit knowledge.

This result matched Soral et al.'s (2022) research, which indicated the significant effect of incentives on tacit knowledge transfer. Soral et al. related the tendency to hide knowledge among the high levels of employees to the supervisor's dark triad of personality traits and subordinates' knowledge-hiding behavior. Shrivastava et al.' (2021) studied the role played by the nature of knowledge and the knowledge-creation process in hiding expertise and found a significant impact. Shrivastava et al.'s findings aligned with this research's results, as misaligned incentives could trigger specialists to conceal their knowledge (Shrivastava et al., 2021).

Research Question 2/Hypothesis 2

RQ2. To what extent, if any, does the employee affective commitment affect the tacit knowledge capture in the mobile applications development domain? This question presented the following null ($H2_0$) and alternative ($H2_a$) hypotheses: $H2_0$. The employee affective commitment, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category. $H2_a$. The employee affective organizational commitment, alone or combined with other factors, significantly affects the tacit knowledge capture in the mobile applications development based on the programmer's category.

Based on the SEM analysis, the null hypothesis failed to be rejected because the affective commitment was not attributed to explain the variance of the tacit knowledge capture. This finding indicates that the level of a programmer's affective commitment to the organization does not influence the attitude toward sharing knowledge. This result was inconsistent with Cugueró-Escofet et al. (2019), Ouakouak and Ouedraogo (2019), and Pu et al. (2022). The conflict could be related research setting of those studies as they were dedicated to examining only the roles of

managers in enhancing the relationship between affective commitment and tacit knowledge capture among other employees' stratification.

The finding did not support the outcome of Kim's (2021) study, which indicated significant positive relationships between supervisor and employee knowledge sharing. This result partially matched the findings of Yuan and Ma's (2022) study. Yuan and Ma studied the mediation effects of gender instead of employee stratifications regarding the relationship between affective commitment and tacit knowledge capture.

Research Question 3/Hypothesis 3

RQ3. To what extent, if any, does organizational regulation compliance affect the tacit knowledge capture in the mobile applications development domain? This question presented the following null ($H3_0$) and alternative ($H3_a$) hypotheses: $H3_0$. $H3_0$. The organizational regulation compliance, alone or combined with other factors, does not significantly affect the tacit knowledge capture in the mobile applications development based on the programmer's category. $H3_a$. Organizational regulation compliance, alone or combined with other factors, significantly affects the tacit knowledge capture in mobile applications development based on the programmer's category.

The results from the SEM multigroup analysis indicate a significant positive relationship between regulation compliance and tacit knowledge capture among low-ranked and high-ranked programmers. Thus, the null hypothesis was rejected. This outcome suggests that the regulation compliance attitude positively affected tacit knowledge capturing for low-ranked and high-ranked programmers. This finding was consistent with Page's (2017) and Shihabeldeen et al.'s (2020) studies, which are organizational culture-based and claim a significant association between an individual's compliance attitude and tacit knowledge sharing.

Conversely, this finding did not concur with Kwanya and Wasinda (2019). Kwanya and Wasinda claimed that only organizational culture and leadership significantly influenced tacit knowledge sharing and diffusion. The rationale for this contrast might be that investigation was conducted in different contexts that examined only the leaders of the organizations, and lower levels of employees were excluded.

Research Question 4/Hypothesis 4

RQ4. To what extent, if any, does the programmer's years of experience moderate the relationships between tacit knowledge capturing and programmer's category? This question presented the following null ($H4_0$) and alternative ($H4_a$) hypotheses: $H4_0$. Programmers' years of experience do not moderate the relationships between tacit knowledge capturing and the programmer's category. $H4_a$. A programmer's years of expertise mediate the relationships between tacit knowledge capturing and the programmer's category.

The results from the SEM multigroup analysis found significant, influential effects on the programmer's level of experience as a moderator in the relationships between tacit knowledge capturing and the programmer's category. Thus, the null hypothesis was rejected. The moderation effect of the low-exp group between the two variables was positive, while it was unfavorable for the high-exp group, as shown in Table 4.16 and Table 4.17 consecutively. This outcome suggests that as a programmer acquires more experience, the organizational ability to capture tacit knowledge decreases.

The finding helped further affirm that the tendency to hide tacit knowledge increases as employees acquire more experiences. This outcome also matched the determination of Saini et al. (2018), which was based on the *Theory of Organizational Knowledge Creation*. Further, Saini

et al.'s (2018) study indicated the importance of the role of trust among employees to share knowledge.

The significant correlation between the level of employment and tacit knowledge capture based on employee experience level was further supported by Sparkling and Dogra (2021) and Tahir et al. (2021) findings. Sparkling and Dogra (2021) revealed that the significant relationship between an individual's experience and reliance on tacit knowledge is most critical among supervisors with 20 years of work experience. Tahir et al. (2021) supported the findings by indicating that unspoken knowledge-sharing behavior was significantly affected over time.

However, Peng et al.'s (2021) study conveyed different organizational cultures, and social exchange-based studies indicated conflicting significant effects depending on the nature of experience acquired over time. Peng et al. showed that unified experience has different consequences on knowledge-capturing processes. Positive experiences lead to a positive attitude toward knowledge sharing, while competitive experiences lead to knowledge-hiding behavior (Peng et al., 2021).

Research Question 5/Hypothesis 5

RQ5. To what extent, if any, does the programmer's category moderate the relationships between tacit knowledge capturing, organizational reward, regulation compliance, and affective commitment predictors? This question presented the following null ($H5_0$) and alternative (Hf_a) hypotheses: $H5_0$. The programmer's category does not moderate the relationships between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors. $H5_a$. The programmer's category reconciles the relationships between implicit knowledge charging, executive compensation, regulation compliance, and affective commitment predictors.

The results from the SEM multigroup analysis indicate an insignificant moderating effect in the relationship between tacit knowledge capturing and organizational reward, regulation compliance, and affective commitment predictors. This outcome implied that programmers' stratifications did not influence the relationship between the combined independent variables and the tacit knowledge capture dependent variable.

Little was known about previous studies that examined the relationship between the combined (organizational reward, regulation compliance, and affective commitment) and tacit knowledge capturing in the context of employment stratifications. De Grandis (2020) indicated a significant, influential effect of employment stratification between tacit knowledge, combined reward policies, and employee commitment. The rationale for this variation might be that the study did not include the organizational regulation compliance variable. However, De Grandis's (2020) findings are in contrast with Askarinejad and Elham's (2019) and Nelufule's (2021) studies that indicated a negligible influence of reward policies on tacit knowledge capturing.

Recommendations for Practice

Challenges associated with tacit knowledge transfer among software developers pose a problem in building personal and organizational strategies (Buunk et al., 2019), and imbalanced tacit knowledge capturing of tacit knowledge leads to poor service delivery and negatively influences organizational performance (Bonomi et al., 2020; Mtsweni & Maveterra, 2019). Amber et al. (2019), Henttonen et al. (2016), and (Moreno et al. (2018) argued that inadequate tacit knowledge sharing affects nearly 60% of mobile application development organizations.

Standish Group CHAOS's recent report indicated that success in mobile software projects is only 29%, and 19% fail outright globally (Shongwe, 2017). Further, According to Dogan and Dogan (2020), tacit knowledge-sharing accounts for 36.2% of organizational

innovation speed and 32.1% of innovation quality. Additionally, several scholars examined the correlation between poor implicit knowledge sharing and mobile software development projects. Scholars have shown that success in mobile software projects was only 29%, and 52% were achieved with several challenges (Balle et al., 2018; Khoza & Pretorius, 2017; Metin, 2019; Snelson, 2016).

Different scholars examining predictors for the tacit knowledge-sharing aspect have confirmed the appropriateness and validity of the organizational culture and social exchange theoretical basis (Escofet et al., 2019; Ouakouak & Ouedraogo, 2019; Shrivastava et al., 2021; Soral et al., 2022). Additional scholars have argued that organizational culture and social exchange theories offer a robust theoretical base for exploring tacit knowledge capture predictions (Yang & Chen, 2020; Zhang et al., 2018). The findings of this investigation further support these assertions since the theoretical model utilized in this study accounts for the 66.3% variance in tacit knowledge capturing.

The results of this study offer scholars and practitioners important insight into understanding the mobile application developers' perspectives of tacit knowledge-capturing processes. Comprehending the factors influencing knowledge sharing and capturing enables organizations' leaders to establish suitable future provisions and measures to tackle the challenges. According to the findings of this study, reward policies, regulation compliance, programmers' years of experience, and programmers' stratification significantly impact the organizations' ability to capture programmers' tacit knowledge.

Various investigations have supported the significant, influential effect of reward policy in this study, highlighting its importance for predicting tacit knowledge capturing (Saini et al., 2018; Sparkling & Dogra, 2021; Tahir et al., 2021). The investigations also revealed that

programmers' stratifications were crucial in mediating the relationship between reward policies and knowledge capture. Unlike the low-ranked group, it appeared that high-ranked programmers significantly negatively impacted the relationship between reward policies and knowledge capture.

This aspect should be addressed as reward policies in place appeared ineffective without associating the perspective of high-ranked individuals. It is recommended that organizations reward policymakers in both private and public sectors for reviewing their policies and adjusting them. That adjustment must focus on how those policies positively impact high-ranked employees' attitudes toward sharing knowledge. The reward policies need to reflect the nation of the organization's readiness to recompensate tacit knowledge-sharing efforts made on its behalf.

Further, to effectively address the high-ranked programmers for hiding knowledge, it is recommended that the reward policies consider team members as interdependent in achieving tasks and reward the team collectively. The reward policies should be dedicated to special rewards on an individual basis according to the greater engagement in the team efforts. Besides, the incentives must be monetary and non-monetary to meet many employees' needs.

The strong influence of organizational regulation compliance on the tacit knowledge capture based on employee stratification indicated in this study has also been supported by numerous research underscoring the prediction of the tacit knowledge capturing aspect (Page, 2017; Shihabeldeen et al., 2020). This significant correlation also indicates that it was positive for both levels of programmer's stratifications, implying that all programmers perceived regulations compliance as a good attitude and would lead to knowledge transfer. Consequently, several recommendations could be offered to organizations' leaders.

It is recommended that organizations establish guidelines regarding software development process documentation. Page (2017) argued that process documentation is an efficient approach to capturing experts' tacit knowledge. Accordingly, organizations' leaders could use rating mechanisms to evaluate individuals' performance based on their precision of process documentation attitude and behavior.

Organizations must set process documentation compliance standards stipulated in the organizational governance procedures. It is recommended that corporate leaders ensure that regulations compliance is essential to organizational culture and day-to-day employee attitude. Training and awareness could be utilized to integrate documentation regulation compliances as part of the organization's culture.

It is also recommended that organizations determine and document requirements of regulations concerning knowledge sharing capturing, in addition to ensuring that compliance requirements are updated frequently and monitored to decide if they are still relevant. Further, it is recommended to establish in-house audit processes to ensure the employees' adherence to regulatory guidelines.

In this research, the programmer's years of experience were a significant moderator in explaining programmers' stratification as a predictor for tacit knowledge capturing. This outcome is analogous to results reported by (Ruparel & Choubisa, 2020), who claimed that the interaction effects between employee experience and employment stratification within the team could be assessed to understand and decrease behaviors of knowledge hiding.

The research results also indicate that high-ranked negatively modifies tacit knowledge transfer. The outcome matched several research findings (Abraham & Baral, 2018; Arain et al., 2021; Connelly et al., 2019; Ruparel & Choubisa, 2020). The outcome implies that programmers

with higher levels of ranking and more experience tend to hide their knowledge. Abraham and Baral (2018) attributed the general knowledge-hiding behavior to job insecurity when employees consider their work colleagues an imminent threat to them.

Therefore, it is recommended that organizational leaders establish group-based interactions with the employees to reduce and prevent knowledge-hiding behavior. Such interaction could come from maintaining group advice and feedback, group incentive, and establishing a team-based mission and vision. Further, several researchers revealed that knowledge hiding could be reduced by promoting employee learning goal orientation (Connelly et al., 2019). Accordingly, it is recommended that organizations' leaders maintain learning goal orientation enhancement. Such enhancement could be achieved by continuously keeping tasks challenging for high-ranked programmers.

Recommendations for Future Research

This research required that the surveyed sample is mobile software development employees in the United States, both males, and females, with different age groups, employment levels, and employment years. The investigation was delimited to a sample representative of the intended population: technical individuals working for an organization established in the United States. Therefore, the sample of this investigation is not an accurate generalizable representation of the mobile applications development domain in the entire world.

However, the research findings offer important insight into understanding the U.S. sample's perspectives of organizations' ability to capture tacit knowledge. Future research is recommended to expand beyond mobile applications development in the U.S. This should provide a better understanding of developers' attitudes and perceptions to share their tacit knowledge from global work cultures. Furthermore, including input from the organization's

managerial non-technical monitoring and rating programmers' attitude towards knowledge sharing.

The research findings showed that employee affective commitment does not significantly affect the tacit knowledge capture in mobile applications development based on the programmer's category. This outcome suggests that employee stratification does not moderate the relation between affective commitment and implicit knowledge sharing. Therefore, it would be valuable to expand the theoretical research model to test the influence of other determinants, such as continuance and normative commitment (Elisabeth et al., 2021).

Even though the research findings indicate significant relations between programmers' stratification and tacit knowledge capture, the programmer experience did not reflect a robust moderating effect between those variables. Future research should also examine the moderating effects of categorical variables such as the programmer's gender and training recency. In addition, future research should examine the moderating effects of programmers' social influence, job satisfaction, and perceived organizational support. Finally, qualitative research approaches could be utilized to improve the model and better understand what influences programmers' positive and negative perceptions of tacit knowledge sharing and capturing.

Conclusions

This non-experimental correlational quantitative investigation aimed to examine the factors that predict the organizational ability to capture programmers' tacit knowledge in the mobile application development domain. To better comprehend inferential knowledge-capturing processes, the research model examined four latent and two categorical variables TKC, AC, RP, RC, P_LVL, and EXP. Findings of the SEM and multiple group paths analysis models indicated that organizational reward policy and regulation compliance variables are significant predictors

of the TKC based on programmers' stratification. However, in the case of the reward policies variable, the high-ranked programmers have a negative moderation effect on the relationships with the incentive policies. Likewise, this research revealed that programmers' experience was a significant moderator in explaining the relationship between programmers' stratification and TKC processes.

For addressing the identified determinants factors for predicting the tacit knowledge capture regarding the incentive policies, this study recommended that the reward policymakers in mobile application development organizations should (1) consider team members as interdependent in achieving tasks and reward the team collectively, (2) review, update, and adjust those policies, and (3) ensure that regulations compliance is essential to organizational culture and day-to-day employee attitude

For enhancing the processes of tacit knowledge transfer and capture, this study recommends that organizations should (1) establish guidelines regarding software development process documentation, (2) organizations determine and document requirements of regulations concerning knowledge sharing and capturing, and (3) ensure that compliance requirements are updated frequently and monitored to decide if they are still relevant, (4) establish in-house audit processes to ensure the employees' adherence to regulatory guidelines, (5) establish group-based interactions with the employees to reduce and prevent knowledge-hiding behavior, and (6) maintain learning goal orientation enhancement.

The research findings have vital theoretical and practical implications. From an academic standpoint, the study's empirical evidence revealed that the research model is suitable for studying the determinants of tacit knowledge capturing. Further, the model utilized in this research accounted for 66.3% of the variance in the dependent variable. From a practical

viewpoint, the research results offer scholars and practitioners critical insight into comprehending the major derive of explicit knowledge capture and potentially accelerating the knowledge-sharing rate among employees.

Understanding the predicting factors that enhance the tacit organizational knowledge-capturing processes would enable policy makers and organizations' leaders in software development. It would allow them to formulate suitable future provisions and approaches to tackle issues related to the inadequate level of sharing tacit knowledge among employees. Equipping organizations with pertinent information and resources leads to more educated strategies, with may translate into advanced programmers' inferential knowledge-capturing processes.

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Appendix A
NCU IRB Approval Letter

NORTHCENTRAL UNIVERSITY

9388 Lightwave Avenue
San Diego, CA 92123

Date: May 17, 2022
PI Name: kamal alhassan
Chair Name (if applicable): William Tribbey
Application Type: Initial Submission
Review Level: Exempt - Category 2
Study Title: Tacit Knowledge Sharing in Software Development Projects of Mobile Applications Domain

Approval Date: May 17, 2022
Expiration Date: N/A

Dear kamal:

Congratulations! Your IRB application has been approved. Your responsibilities include the following:

1. Follow the protocol as approved. If you need to make changes with your population, recruitment, or consent, please submit a modification form.
2. If there is a consent process in your research, you must use the consent form approved with your final application. Please make sure all participants receive a copy of the consent form.
3. **If there are any injuries, problems, or complaints from participants (adverse events), you must notify the IRB at IRB@ncu.edu within 24 hours.**
4. IRB audit of procedures may occur. The IRB will notify you if your study will be audited.
5. When data are collected and de-identified, please submit a study closure form to the IRB. See the IRBManager instructions on our website.
6. You must maintain current CITI certification until you have submitted a study closure form.
7. If you are a student, please be aware that you must be enrolled in an active dissertation course with NCU in order to collect data.

Best wishes as you conduct your research!

Respectfully,

Northcentral University Institutional Review Board
Email: irb@ncu.edu

Appendix B
Consent Letter

Introduction

My name is Kamal Omer Alhassan, and I am a doctoral student at Northcentral University (NCU).

I am conducting a research study on tacit knowledge sharing in the mobile application domain. The name of this research study is "Tacit Knowledge Sharing in Software Development Projects of Mobile Applications Domain." I am seeking your consent to participate in this study.

Please read this document to learn more about this study and determine if you would like to participate. Your participation is completely voluntary, and I will address your questions or concerns at any point during the examination.

Eligibility

You may participate in this research if you meet all of the following criteria:

1. You are age 18 or older.
2. You have worked or are currently working as a mobile application developer.
3. You work for an establishment in the United States.

I hope to include 150-200 people in this research.

Activities

If you decide to participate in this study, you will be asked to do the following activities:

1. Complete an online survey for 25-30 minutes

During these activities, you will be asked questions about the following:

- Your length of experience and programming role.
- The degree to which you believe you belong to your organization.
- The degree to which you believe that your organization's knowledge management system successfully captures developers' tacit knowledge.
- The degree to which you comply with your organization's regulations and policies.
- The degree to which you believe that the reward influences your work attitude and behavior

All activities and questions are optional: you can skip any part of this study that you do not wish to complete and can stop at any time.

If you need to complete the activities above differently than I have described, please let me know, and I will attempt to make other arrangements.

Risks

There are no foreseeable risks or discomforts associated with this study. You can skip any question you do not wish to answer, reflect on any activity, or stop participation at any time.

Benefits

If you participate, there are no direct benefits to you. This research may increase the body of knowledge in the subject area of this study.

Privacy and Data Protection

I will take reasonable measures to protect the security of all your personal information, but I cannot guarantee the confidentiality of your research data. In addition to me, the following people and offices will have access to your data:

- My NCU dissertation committee and any appropriate NCU support or leadership staff
- The NCU Institutional Review Board

This data could be used for future research studies or distributed to other investigators for future research studies without additional informed consent from you or your legally authorized representative.

I will securely store your data for three years. Then, I will delete electronic data and destroy paper data.

How the Results Will Be Used

I will publish the results in my dissertation. I may also share the results in a presentation or publication. Participants will not be identified in the results.

Contact Information

If you have questions, you can contact me at: K.Alhassan9831@o365.ncu.edu.
My dissertation chair's name is Dr. Will Tribbey. He works at Northcentral University and is supervising me on the research. You can contact him at: wtribbey@ncu.edu or 907-867-5309.
If you have questions about your rights in the research or if a problem or injury has occurred during your participation, please get in touch with the NCU Institutional Review Board at irb@ncu.edu or 1-888-327-2877 ext. 8014.

Voluntary Participation

If you decide not to participate or stop participating after you start, there will be no penalty to you: you will not lose any benefit to which you are otherwise entitled.
Do you agree to participate in this study?

☐ Yes, I agree.

☐ No, I disagree.

Appendix C
ITConsultantGroup Survey Site Permission

Re: Survey Site Permission

ITConsultantGroup@outlook.com <ITConsultantGroup@outlook.com>

Mon 5/2/2022 8:11 AM

To: Kamal Alhassan <K.Alhassan9831@o365.ncu.edu>

Dear Mr. Alhassan
Hello NCU IRB,
My name is Hamza Abubakr and I am Vice President at IT Consulting Group. I have reviewed Kamal Alhassan's study, and I understand that you are recruiting participants who meet all of the following criteria:

1. You are age 18 or older.
2. You have worked or are currently working as a mobile application developer.
3. You work for an establishment in the United States.

I grant permission to Kamal Alhassan to do the following:

1. Complete an online survey for 25-30 minutes.

If you have questions and would like to reach me, please do so at ITConsultantGroup@outlook.com or 210-530-8053.
Date: 04/30/2022
Sincerely,

Hamza B. Abubakr
Vice President
Cell: 210-530-8053.
Office:210-725-1843
ITConsultantGroup@outlook.com
2347 NW Military HWY Suite #101
San Antonio, TX 78231

Appendix D
ONIExperts Survey Site Permission

Re: Survey Site Permission

Bakri Said <osiexperts@mail.com>
Mon 5/2/2022 9:10 AM
To: Kamal Alhassan <K.Alhassan9831@o365.ncu.edu>

Dear Mr. Alhassan

I am pleased to inform you that I give permission in respect of your research request of studying tacit knowledge sharing in the mobile application domain. Your initiative is appreciable and I am ready to support this research at my best. When ready, please provide me with a link to the survey and I will distribute it by emails to our company's programmers.

We wish you all the best in your research, and please let us know when you need any further assistance from our side.

Thanking you,

Yours truly,

Bakri A. Said

Bakri Said | IT Manager

Cell:720-919-1523

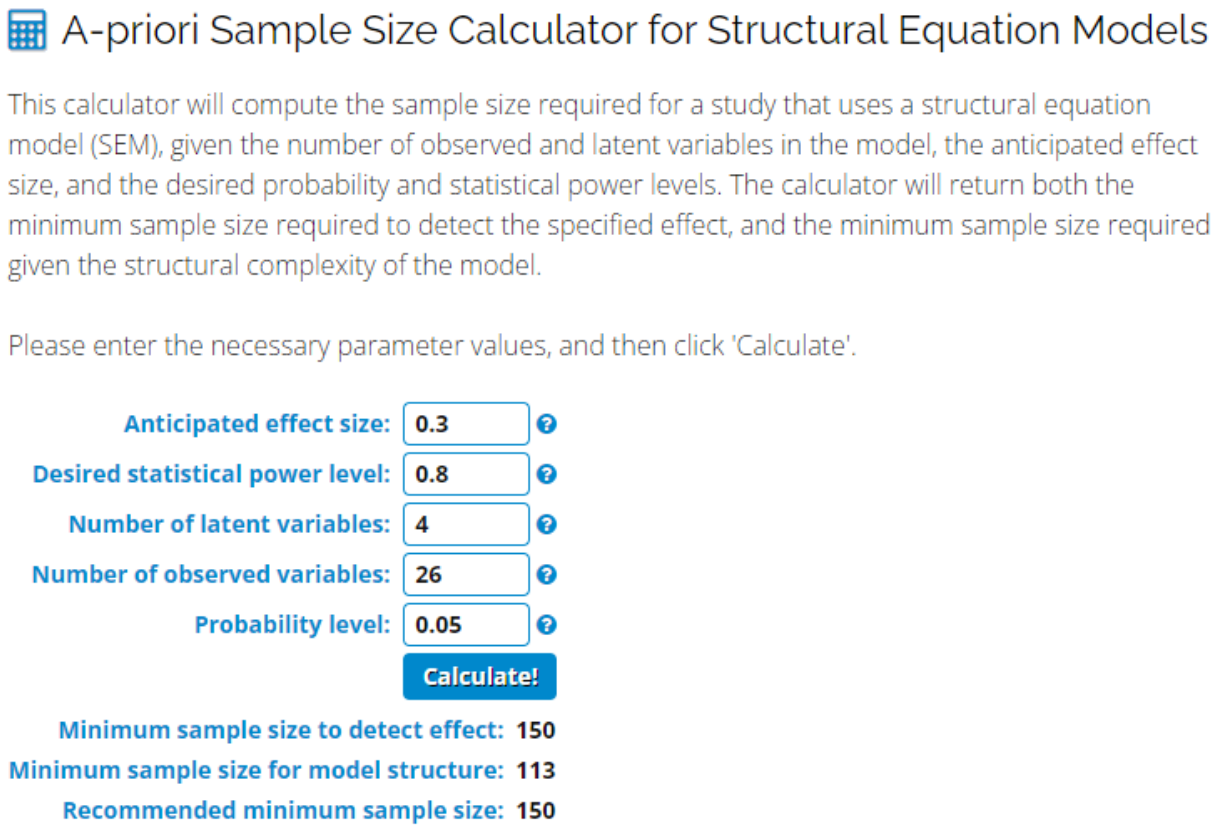
osiexperts@mail.com

1230 S. Parker RD Unit 112

Denver, Co 80231

> **Sent:** Sunday, May 01, 2022 at 10:43 AM
> **From:** "Kamal Alhassan" <K.Alhassan9831@o365.ncu.edu>
> **To:** "osiexperts@mail.com" <osiexperts@mail.com>

Appendix E
A-priori Sample Size Calculation



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Appendix F
Survey Instrument

For sections B, C, D, and E, please indicate your level of agreement to the statements below from 1 to 7 with (1) Strongly disagree (S.D.); (2) Disagree (D); (3) Somewhat Disagree (SWD); (4) Neither Agree nor Disagree (NAND); (5) Somewhat Agree (SWA); (6) Agree (A); and (7) Strongly Agree (S.A.).

Section A:
This section describes your role in your organization and your length of experience.
Please enter the number of years as a programmer.
☐ Less than three years.
☐ Between 3 and 5 years.
☐ Between 5 and 10 years.
☐ More than ten years.
Would you please enter your programming role in your organization?
☐ Junior programmer.
☐ Mid-level programmer.
☐ Senior programmer.
☐ Manager programmer.

Section B:
This section describes the degree to which you believe you belong to your organization.
How well do the following statements describe your commitment attitude towards your organization?
1. I would be delighted to spend the rest of my career with this organization.
☐ ☐ ☐ ☐ ☐ ☐ ☐
2. I feel as if this organization's problems are my own.
☐ ☐ ☐ ☐ ☐ ☐ ☐
3. I do not feel a strong "belonging" to my organization.
☐ ☐ ☐ ☐ ☐ ☐ ☐
4. I do not feel "emotionally attached" to this organization.
☐ ☐ ☐ ☐ ☐ ☐ ☐
5. I do not feel like a "part of the family" at my organization.
☐ ☐ ☐ ☐ ☐ ☐ ☐
6. This organization has a great deal of personal meaning to me.
☐ ☐ ☐ ☐ ☐ ☐ ☐

Section C:
This section describes the degree to which you believe that your organization's knowledge management system successfully captures developers' tacit knowledge.

1- My organization’s knowledge management system allows my coworkers to exchange ideas and thoughts on standard work practices.

☐ ☐ ☐ ☐ ☐ ☐ ☐

2- My organization’s knowledge management system initiative has received sufficient resources (people, money, etc.) to facilitate its success.

☐ ☐ ☐ ☐ ☐ ☐ ☐

3- Since its inception, the volume of knowledge contained within the knowledge management system has consistently increased.

☐ ☐ ☐ ☐ ☐ ☐ ☐

4- My organization’s knowledge management systems meet the knowledge needs of my area of responsibility.

☐ ☐ ☐ ☐ ☐ ☐ ☐

5- My organization’s knowledge management system is very efficient.

☐ ☐ ☐ ☐ ☐ ☐ ☐

6- My organization’s knowledge management system is very effective.

☐ ☐ ☐ ☐ ☐ ☐ ☐

7- My organization’s knowledge management system provides me with the necessary knowledge.

☐ ☐ ☐ ☐ ☐ ☐ ☐

8- My organization’s knowledge management system provides knowledge from multiple sources.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Section D:

This section describes the degree to which you comply with your organization’s regulations and policies.

1. Complying with administrative regulations and procedures is something that’s typical of “me.”

☐ ☐ ☐ ☐ ☐ ☐ ☐

2. Complying with administrative regulations and procedures is something I have been doing for a long time.

☐ ☐ ☐ ☐ ☐ ☐ ☐

3. Complying with administrative regulations and procedures makes my work more difficult.

☐ ☐ ☐ ☐ ☐ ☐ ☐

4. Complying with administrative regulations and procedures inconveniences my work.

☐ ☐ ☐ ☐ ☐ ☐ ☐

5. Complying with administrative regulations and procedures is something I do automatically.

☐ ☐ ☐ ☐ ☐ ☐ ☐

6. I do this without consciously remembering the administrative regulations' procedures.

☐ ☐ ☐ ☐ ☐ ☐ ☐

7. Complying with administrative regulations and procedures makes me feel weird if I do not do it.

☐ ☐ ☐ ☐ ☐ ☐ ☐

8. Complying with administrative regulations and procedures is something that belongs to my (daily, weekly, and monthly) routine.

☐ ☐ ☐ ☐ ☐ ☐ ☐

9. Complying with administrative regulations and procedures is something I start doing before I realize I'm doing it.

☐ ☐ ☐ ☐ ☐ ☐ ☐

10. Complying with the administrative regulations' procedures would be time-consuming.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Section: E

This section describes the degree to which you believe the reward influences your work attitude and behavior.

1- I will receive a higher salary for my knowledge sharing.

☐ ☐ ☐ ☐ ☐ ☐ ☐

2- I will receive a higher bonus for my knowledge sharing.

☐ ☐ ☐ ☐ ☐ ☐ ☐

3- I will receive increased promotion opportunities for my knowledge sharing.

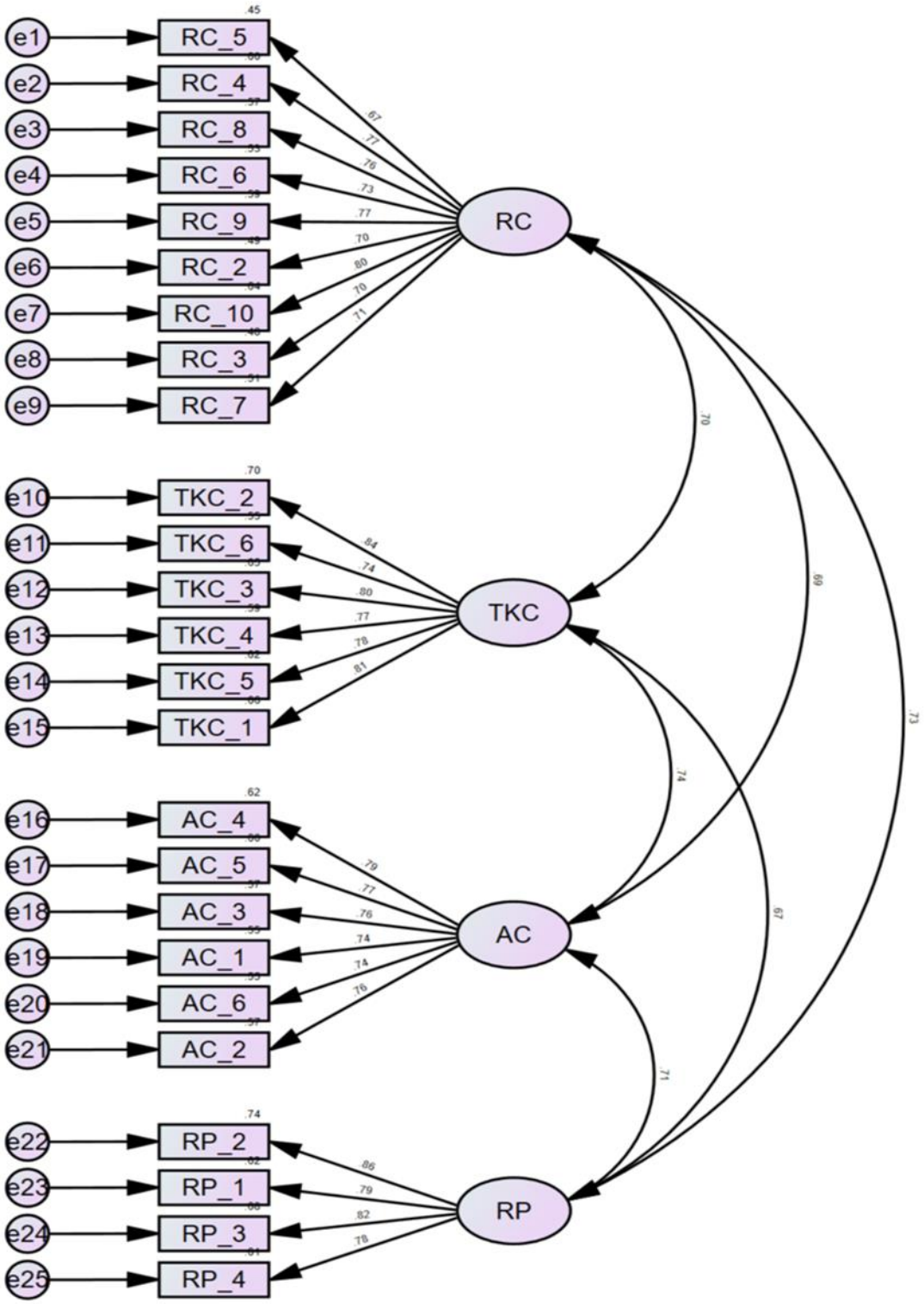
☐ ☐ ☐ ☐ ☐ ☐ ☐

4- I will receive increased job security for my knowledge sharing.

☐ ☐ ☐ ☐ ☐ ☐ ☐

Appendix G

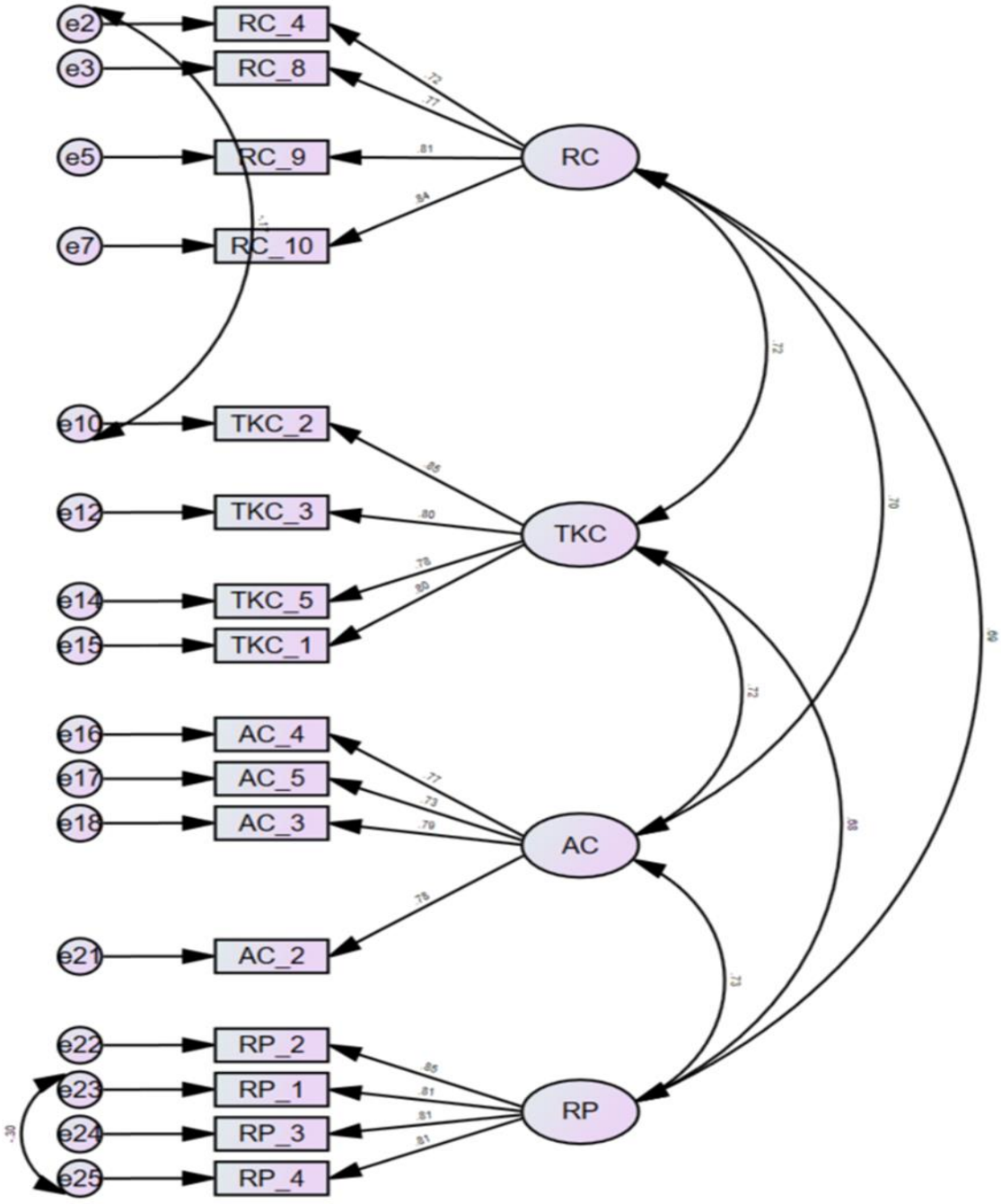
Measurement model Initial CFA



Note. Tests of model fit using maximum likelihood (ML) estimation (N = 179): The ratio of χ 2/df = 1.285, p = .001; GFI = .954; AGFI = .954; NFI = .887; CFI = .972; RMSEA = .040; RMR = .102.

Appendix H

Measurement model Final CFA



Note. (The ratio of χ 2/df = .894, p = .001; GFI = 1.000; AGFI = .929; NFI = .956; CFI = 1.000; RMSEA = .000; RMR = .079; Default model Standardized RMR = .0317)