

Investigating Knowledge Transfer Practices: Insights from Software Development Project Managers

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Abstract: Software Development Projects (SDPs) in developing economies often experience high failure rates, with the knowledge transfer (KT) behavior of SDP managers being a key challenge. While research on KT behavior is extensive in developed nations, limited studies focus on emerging economies, particularly Nigeria. This study aims to examine the factors influencing KT behavior among SDP managers in Nigeria based on insights from Social Cognitive Theory (SCT) and the SECI model. This study employs a quantitative research approach with multiple regression analysis in SPSS to test the research hypothesis and analyze the relationships among the variables in the proposed model. Data was collected from 160 SDP managers in Nigeria using a structured survey questionnaire. The results indicate that Work Motivation, Trust to Share, Social Interaction, IT Infrastructure, and Security and Privacy significantly influence KT behavior among SDP managers. However, Reciprocity, Social Identity, and Shared Language were found to have no significant impact. These findings suggest that both psychological and technological factors play a vital role in fostering KT behavior, however SDP managers in Nigeria do not regard reciprocal benefit social identity and shared languages as critical factors that influences their KT behaviors. This study provides insights for SDP managers, policymakers, and knowledge management practitioners on the factors that can improve KT behaviors of SDP managers. It emphasizes the need for targeted interventions, such as fostering trust-based collaboration, strengthening IT infrastructure, and ensuring secure knowledge-sharing platforms to enhance KT practices.

Keywords: Knowledge transfer behavior, Software development project manager, Social cognitive theory, SECI theory

1. Introduction

The Fourth Industrial Revolution (4IR) has significantly increased reliance on Information, Communications, and Technology (ICT), with software development projects (SDPs) emerging as critical components in this landscape (Ayentimi and Burgess, 2019). SDPs play a vital role in enabling organizations across various sectors such as healthcare, education, and finance to remain competitive in this era. The primary goal of these projects is to develop software solutions that streamline and enhance organizational processes, thereby contributing to overall efficiency and productivity (Khan and Keung, 2016). Despite their importance, there has been a high failure rate of SDPs which has become a global concern for both researchers and industry experts alike (Lehtinen et al., 2014; Niazi et al., 2016). The failure of SDPs is not a recent phenomenon, it dates back to the 1960s when the issue was first recognized as an international crisis affecting both developed and developing nations (Mtsweni and Gorejena, 2023).

The Standish Group's (CHAOS Report, 2020), which analysed 50,000 projects worldwide, revealed that 66% of SDPs either fail partially or completely. In developed nations like the United States, 31% of SDPs are outrightly cancelled, while 53% are so problematic that they are considered "challenged" (Faeth, 2022). This trend is not limited to developed countries; SDPs in developing nations, including Nigeria, face similar challenges (Ardo, Bass and Gaber, 2023; Mtsweni and Gorejena, 2023; Srisuksa, Wiriyaipinit and Bhattarakosol, 2022). Despite these challenges, the number of SDPs has increased significantly in developing countries, attracting substantial investments. For instance, South African enterprises are projected to invest R150 billion in SDPs, with potential losses of R18 billion due to the high failure rate of these projects (Marnewick, 2016; Niazi et al., 2016). This highlights the severity of SDP failures, particularly in developing nations.

Nigeria ranks 122nd out of 140 countries in digital skills development, which has significantly impacted SDP organizations. The shortage of experienced professionals, driven by uncompetitive salaries and limited career advancement opportunities compared to more developed regions, has contributed to the high failure rate of Nigerian SDP organizations (Kazeem, 2018). For instance, Ramachandran et al. (2019) reported that most Nigerian SDP firms employ only a small number of full-time project managers, with 11% of these organizations urgently needing additional expertise. Additionally, local tech entrepreneurs struggle to attract and retain skilled personnel, as they compete with larger, well-established companies offering higher salaries and better working conditions (OC&C Consulting, 2018). This persistent talent shortage remains a major barrier to the growth and sustainability of Nigeria's tech sector (Ramachandran, Obado-Joel, and Dempster, 2019).

SDPs are essentially knowledge-intensive, requiring a combination of explicit and tacit knowledge to carry out socio-technical activities that are focused on human needs (Mtsweni and Gorejena, 2023). While access to documented explicit knowledge is generally not an issue, SDP teams often struggle with limited access to tacit knowledge held by SDP managers (Smith, 2001). This limited access becomes a significant barrier when teams are unable to perform tasks to the requisite standard, leading to delays and project failures. The difficulty in transmitting tacit knowledge suggests the presence of unexplained barriers, with SDP managers potentially contributing to these challenges by restricting the flow of their expertise.

In each project a SDP manager takes the lead and oversees the coordination of activities, ensuring adherence to schedule, scope, budget limitations and manage the employees involved concurrently in order to achieve the expected project outcome (Chai and Lebeaux, 2020; Kaleshovska and Pulevska-Ivanovska, 2019). The role of a SDP manager is not limited communication, planning, leading, coordinating, task delegation, and executing SDP activities but also navigate more complex challenges than their team members, requiring a profound understanding of both managerial and technical aspects (Jennex, 2019). These skills can be honed and enhanced through training, on- the-job experience, and knowledge transfer (KT) by more experienced project managers. Given that SDP is knowledge-intensive in nature and the knowledge of the SDP manager is crucial to the project success, effective KT of SDP manager to his team members is therefore important to achieve project success. Thus, businesses must prioritize the transfer of this knowledge and skills.

Additionally, having an effective KT process provides firms with a competitive edge (Osterloh and Frey, 2000) but the majority of project managers continue to lack adequate transfer of project management expertise which affects their KT behavior. While there is numerous definitions of KT in the past, all of which are consistently stating that KT is the transfer of experience and expertise from a sender (i.e., SDP manager) to a receiver (i.e. SDP team members) within a particular environment until the receiver acquires new expertise in that environment. However, KT behavior of SDP manager refers to the intentional actions and processes through which they share, disseminate, and communicate both tacit and explicit knowledge with their teams to enhance project efficiency and success (Nonaka, 1994; Polanyi, 1966). This behavior is critical in SDP, where knowledge is highly specialized, dynamic, and context-dependent (Dalkir, 2011). SDP managers engage in KT behavior through various mechanisms, including documentation, mentoring, meetings, informal discussions, and the use of collaboration tools (Stampfl, Prodinger and Palkovits-Rauter, 2024). Therefore, effective KT fosters knowledge continuity, minimizes project delays, and enhances team performance.

KT in developing countries like Nigeria differs significantly from that in developed economies where they benefit from well-established knowledge management (KM) systems, robust IT infrastructure, and institutionalized knowledge-sharing cultures (Nonaka and Takeuchi, 1995; Dalkir, 2011). For instance, Nigerian SDP organizations face substantial challenges that impede efficient KT practices. The lack of skilled manpower and knowledge incubation facilities results in frequent talent migration, making it difficult for indigenous tech firms to retain experienced professionals (Ajayi, 2020; Ramachandran et al., 2019). Unlike developed countries where formal KM strategies are widely implemented, knowledge-sharing in Nigerian tech firms is often informal and ad hoc, increasing the risk of knowledge loss when the experienced employees leave the organization (Ibitowa and Akinola, 2020). Furthermore, vulnerability of IT tools in Nigeria exacerbate KT challenges and undermine trust in project management platforms (Binuyo, 2020).

Unlike developed economies where secure and integrated digital platforms facilitate seamless KT, Nigerian organizations often lack the necessary measures, leading to frequent breaches that deter professionals from openly sharing knowledge (Ajayi, 2020). While Nigerian SDP organization battles with shortage of skilled SDP professionals there is a pressing need for these organizations to mitigate strategies for implementing KT practices from experienced SDP managers to less experienced team members so that when the project manager leave the organization their knowledge still remains within the organization. SDP managers play a crucial role in

the success of SDP initiatives in Nigeria. However, a review of the literature reveals that while extensive research has been conducted on SDP and KT practices, little to no focus has been placed on Nigeria or the specific KT behaviors of Nigerian SDP managers. Despite the growing number of SDP initiatives, the Nigerian software industry continues to face a shortage of skilled SDP managers, and many indigenous companies remain underdeveloped. This talent gap, coupled with organizational and structural challenges, has contributed to a reluctance among SDP managers to actively engage in KT practices.

Given the critical role of KT in enhancing project success and fostering industry growth, this study aims to examine the factors that may influencing KT behavior among SDP managers in Nigeria. Grounded in Social Cognitive Theory (SCT) and the SECI model, this research will provide empirical insights into the determinants of KT participation, offering practical recommendations for strengthening KT practices and improving the sustainability of SDP initiatives in Nigeria.

2. Literature Review

In this study, a preliminary literature review was conducted to establish a foundational understanding of KT and its relationship with SDP failure. Following this, significant elements and theories related to the study were identified and hypothesized to examine the relationships and provide a comprehensive framework. This approach aligns with other research in the field of SDP (Babalola and Omotayo, 2017; Buthelezi and Mkhize, 2015; Khoza and Bwalya, 2021). This section provides an overview of the existing literature on KT in SDP organizations, with a particular focus on its relevance to developing countries. It also identifies the factors associated with ensuring the implementation of KT practices for SDP managers, particularly in Nigeria.

2.1 Knowledge Transfer and Software Development Project Organizations

The transfer of knowledge also known as KT has been defined in various ways over time (Argote and Ingram, 2000; Carlile and Rebentisch, 2003; Liyanage et al., 2009), but these definitions consistently emphasize the core idea that KT involves the movement of experience and expertise from a source to a recipient within a specific context, enabling the recipient to acquire new skills and knowledge in that environment. KT is a process that involves disseminating knowledge, talents, skills, and experience among individuals within an organization, and it is an essential component for enhancing performance, fostering sustainability, and an edge over competitors (Lartey et al., 2022). Later research expanded on this by emphasizing that effective KT requires not only the transmission of knowledge from a source to potential recipients but also the recipients' ability to fully understand and apply the knowledge to guide their actions (Davenport and Prusak, 1998; Srisuksa, Wiriapinit and Bhattarakosol, 2022).

SDP organization is a structured entity that manages the planning, execution, and delivery of software projects by integrating technical expertise, managerial coordination, and knowledge management practices (Niazi et al., 2016). These organizations often operate in knowledge-intensive environments, requiring effective collaboration and KT practices such as documentation, mentoring to ensure project success (Ghobadi and Mathiassen, 2016). The primary goal of SDP organization is to successfully design, develop, and deploy high-quality software solutions that meet user requirements, business objectives, and industry standards. These projects often function independently and are sometimes geographically dispersed. This setup leads to communication barriers among project teams, which in turn impede KT and hinder the learning process (Wiewiora et al., 2009). Such barriers contribute to learning closure, where cross-project learning and communication are limited, ultimately resulting in project failures (Hobday, 2020). The transfer and application of knowledge from one project to another are not effectively realized instead, there is a tendency to repeat past mistakes, often starting new projects without leveraging lessons learned from previous ones (Prusak, 1997).

SDP organizations are characterized by their dynamic nature, relying on diverse design teams to deliver constantly evolving software solutions (Aghimien et al., 2019). The selection of project teams is based on their existing knowledge and expertise relevant to the tasks at hand. However, despite this, many software projects face significant challenges in their early stages due to ineffective KT practices (Srisuksa, Wiriapinit and Bhattarakosol, 2022). This issue is particularly pronounced in SDP organizations in developing countries like Nigeria, where such projects are critical drivers of economic development (Omotayo and Babalola, 2016). Yet, these organizations face obstacles such as inadequate project planning, poor management, and a shortage of skilled software developers (Kazeem, 2018; Obado-Joel and Helen, 2021). The ineffective management of acquired knowledge and the scarcity of proficient software developers are key factors that need urgent attention.

Many organizations overseeing SDPs are owned by individuals with limited industry expertise, who rely heavily on their staff, regardless of their experience level, to bridge this knowledge gap (Srisuksa, Wiriapinit and Bhattarakosol, 2022). Unfortunately, stakeholders often struggle to communicate their expertise throughout the SDP lifecycle within these organizations. When key personnel leave, they typically take their knowledge with them, leaving little to no institutional knowledge for future projects (Anwar et al., 2017). Given the highly competitive nature of the SDP industry, it is crucial for these organizations to develop effective strategies for managing and disseminating knowledge among team members. Efficient KT is therefore essential for the success, growth, and sustainability of SDP organizations.

2.2 Theoretical Foundation

2.2.1 Factors that influence knowledge transfer behaviour

Understanding KT behavior requires examining the influence of human behavior on such activities. Behavioral factors can either facilitate or hinder KT, making it essential to explore the underlying drivers of KT behavior. Numerous studies have investigated factors influencing KT intention and behavior through various theoretical perspectives. While conceptual studies (de Castro et al., 2022), content analyses (Stampfl, Prodinger and Palkovits-Rauter, 2024), and literature reviews (Anwar et al., 2019) have provided valuable insights, survey-based studies have employed diverse theoretical frameworks. Some widely used models include the Theory of Reasoned Action (TRA) (Khoza, 2018; Rese, Kopplin and Nielebock, 2020), Organizational Behavior and Organizational Learning Theory (Biloslavo and Lombardi, 2021), Social Exchange Theory (Jiang and Xu, 2020; Razzak and Ahmed, 2014), Polanyi's Tacit Knowledge Theory, and the Knowledge-Based View (Nurye, Molla and Temtim Assefa Desta, 2019). However, despite the extensive body of research, Social Cognitive Theory (SCT) and the SECI model have been underutilized in explaining KT behavior, presenting an opportunity for further theoretical exploration. This research primarily adapts insights from SCT and SECI Theory due to their suitability for understanding KT behavior.

Empirical research has consistently highlighted individual factors such as trust, reciprocity, social identity, and perceived self-efficacy as critical determinants of KT behavior. For instance, (Rese, Kopplin and Nielebock, 2020) demonstrated that trust and reciprocity significantly influence KT among German software teams, with self-efficacy acting as a mediator. Similarly, (Karagoz, Whiteside and Korthaus, 2020) found that reciprocity is essential in software project environments, although its impact varies based on organizational context. However, conflicting evidence exists. da Silva, Mosquera and Soares (2022) in their research reported that trust and reciprocal benefits had no significant effect on KT, suggesting that contextual factors may shape KT differently across organizations.

The role of shared language in KT has also been widely debated. Omotayo and Babalola (2016) found that shared language positively affects KT, whereas social identity demonstrated a negative correlation, highlighting the intricate interplay between individual and group-level factors. Contrarily, (Davidavičienė, Al Majzoub and Meidute-Kavaliauskiene, 2020) found no strong empirical support for shared language as a determinant of KT in virtual teams, underscoring the need for further investigation into its influence in diverse organizational settings.

Social interactions play a pivotal role in facilitating KT by enabling the exchange of both tacit and explicit knowledge. Mtsweni and Gorejena, (2023) suggested that social interaction among software teams enhances KT by reducing cohesion-related barriers. This aligns with (de Castro et al., 2021) research about the SECI model which emphasizes the role of socialization in KT. However, Jiang and Xu (2020) paper pointed out that reward systems have produced mixed results in knowledge-sharing effectiveness. While Khoza (2018) found that employees in South African SDP firms prioritize compensation when engaging in KT, others argue that intrinsic motivators, such as commitment and self-efficacy, may be more significant.

Security and privacy concerns have been recognized as major obstacles to KT in SDP environments. Akgün et al. (2017) found that perceived risks related to information confidentiality limit KT willingness among software professionals. Similarly, Jiang and Xu (2020) reported that concerns about knowledge misuse negatively impact tacit KT. These findings suggest that organizations must address security and privacy risks to create a conducive KT environment.

IT infrastructure is another critical enabler of KT behavior. Studies have identified IT systems as instrumental in facilitating seamless KT within organizations (Khoza and Bwalya, 2021; Kukko and Helander, 2012; Stampfl, Prodinger and Palkovits-Rauter, 2024). Recent research (Davidavičienė, Al Majzoub and Meidute-Kavaliauskiene, 2020; Islam, Jasimuddin and Hasan, 2015; Stampfl, Prodinger and Palkovits-Rauter, 2024) emphasized IT infrastructure as a key driver of KT among IT professionals in the United Arab Emirates. Anwar et al. (2019)

further proposed a framework highlighting IT infrastructure's role in SDPs, though empirical validation remains necessary. Given the diverse and sometimes contradictory findings in the literature, this study aims to examine key determinants of KT behavior among SDP managers in Nigeria using insight from SCT and SECI model.

2.2.2 *Social cognitive theory*

The SCT provides a framework that assists in the understanding, predicting, and modifying human behaviour. In essence, SCT provides the theoretical foundations that facilitate a dynamic interplay between personal factors, organizational factors, and their influences on an individual's behaviour, in which each factor has a bidirectional impact on each other (Hsu et al., 2007; Shehu Malami, Alawiyah and Ibrahim, 2022). During the mid nineties research by Bandura (1986) and Wood (1988) suggested that human behaviour is a dynamic interaction between personal factors, ethics, and the environment. SCT posits that an individual's knowledge acquisition is intricately linked to observing others (Anwar et al., 2017). Therefore, SCT can be applied this study to understand the factors that effects SDP mangers to participate in KT practices. Bandura argues that if individuals lack confidence in their capacity to effectively share knowledge, they are unlikely to engage in such behaviour, particularly when KT is optional.

Based on SCT, SDP manager's behaviour towards KT practices can be influenced by personal factors and environmental factors, such as those within the project organization (Wood and Bandura, 1989). Previous studies utilizing SCT have identified several factors influencing KT practices, including motivation, trust, social identity, shared language, social interaction, and reciprocity (Babalola and Omotayo, 2017; Buthelezi and Mkhize, 2014; Chiu et al., 2006). For instance, Chiu, Hsu and Wang (2006) found that social interaction ties, reciprocity, and identification significantly enhanced individuals' KT behaviour. However, contrary to expectations, trust and shared language did not significantly impact KT, while a shared vision had a strong, albeit negative, influence on KT practices. This study adopts the variables of work motivation, trust in sharing, social identity, shared language, social interaction, and reciprocity from the SCT framework.

While SCT has been extensively applied to explore factors influencing KT, prior studies have largely overlooked the impact of technological factors. Similarly, research within the SDP literature has paid insufficient attention to the role of technological infrastructure. SCT primarily addresses the question of why individuals engage in KT practices from the perspectives of personal and organizational factors. However, it does not account for the organizational resources that may influence an individual's behaviour. To address this limitation, the SECI model is introduced to complement SCT and provide more understanding of the factors influencing KT behavior of SDP managers.

2.2.3 *Socialization externalization combination and internalization (SECI) model*

The SECI model provides a framework for understanding how knowledge can be converted and shared within an organization. It emphasizes the importance of social interactions, communication, and the creation of shared understanding in the process of knowledge conversion (Nonaka and Takeuchi, 1995). Socialization refers to the process by which individuals interact and learn from one another through methods like observation, imitation, or apprenticeships (Nonaka, 2023). Combination involves merging explicit knowledge through meetings, conversations, or information systems. Internalization converts explicit knowledge into tacit knowledge, while externalization transforms tacit knowledge into explicit knowledge (Nonaka, 2023; Nonaka and Takeuchi, 1995). SECI model has been mostly applied in computer science and information technology (Adesina and Ocholla, 2019) and has usually been adopted in KT studies. Previous studies, including those by Abdelwhab Ali et al. (2019), Adesina and Ocholla (2020), and that of Zhou et al. (2020) have used insights from the SECI model to explain certain factors that influence KT behaviors. This study adopted this strategy in explaining how knowledge is created and transfer among SDP managers in Nigeria.

2.3 **Development of Hypothesis**

2.3.1 *Work motivation*

Work motivation refers to the internal or external factors that drive individuals to engage actively in their work-related tasks, goals, and responsibilities. It can include intrinsic motivation (personal interest, enjoyment), extrinsic motivation (rewards, recognition). Prior research has viewed "work motivation" as a personal factor (Anwar et al., 2017; Nidhra et al., 2013). According to one study, work motivation is the encouraging force behind an individual's behavior (Hung et al., 2011). SDP managers are more likely to engage in KT behaviours if their organization encourages them (Chedid, Alvelos and Teixeira, 2020; Noor Aziela, Nasir Ismail and Rahimi Mohamad, 2022). In developing countries like Nigeria, resource constraints, such as limited access to technology

and training facilities, may impact work motivation and the ability to engage in effective KT behavior (Babalola and Omotayo, 2017; Olatokun and Nwafor, 2012). In Nigeria issues such as the value given to SDP manager's work, cultural norms, and pattern of communication influences how work motivation is perceived and expressed by SDP managers in the workplace. Limitations on the SDP managers in terms of low income and perceived lack of benefit from sharing knowledge make overall knowledge transfer complicated (Khoza and Bwalya, 2021). This study incorporates "work motivation" as a personal factor, resulting in a positive relationship between work motivation and the KT behavior of SDP managers. Therefore, the following hypothesis is formulated:

H1. There is a significant relationship between SDP manager's work motivation and KT behavior.

2.3.2 Trust to share

Trust can be defined as the belief in the reliability, integrity, and competence of others in the work environment. Mayer, Davis and Schoorman (1995), argued that trust involves three key components: competence, integrity, and benevolence, and it influences KT and cooperation. Individuals are inclined to impart their expertise to others when they perceive the imparter to be trustworthy and sincere. According to Blau (1964, p.14) trust is a fundamental component of the social exchange process. Similarly, Nonaka (1994) asserts that interpersonal trust is critical for fostering an environment conducive to knowledge transmission within organizations and teams. The presence of trust among individuals increases their propensity to participate in cooperative behaviours, including KT practices (Nahapiet and Ghoshal, 1998).

Likewise, Montoro-Sánchez, Ortiz-de-Urbina-Criado and Mora-Valentín (2011) in their research assert that trust is a critical component of social transactions; thus, trust can facilitate the transmission of knowledge, since transferring one's knowledge voluntarily with others constitutes a social transaction. Literature indicates that personal relationships, socialization, and constant interactions contribute to the development of trust between individuals (Kotlarsky and Oshri, 2005). The investigation of trust holds particular significance within the framework of developing nations such as Nigeria, where the number of proficient SDP managers is limited (Ramachandran et al., 2019) and there is a perception that they suppress their expertise out of a sense of job security and ownership.

Many studies (Akosile and Olatokun, 2019; Ali, Musawir and Ali, 2018; Babalola and Omotayo, 2017; Jhamba and Steyn, 2021) have reported a positive relationship between trust and KT behavior. Trust in this study is the extent to which SDP managers have confidence in the capabilities and abilities of their team members. Prior research has shown that individuals with a higher level of credibility can share a greater amount of knowledge within their trusted networks (Srisuksa, Wiriyapinit and Bhattarakosol, 2022). This study incorporates trust to share to the proposed model. Thus, it is hypothesized that:

H2. There is a significant relationship between trust to share and SDP manager's KT behavior.

2.3.3 Social identity

Identification, as defined by Bagozzi and Dholakia (2002) pertains to an individual's perception of themselves based on the distinctive characteristics of a social category that includes themselves. In this particular context, the SDP organisation is being referred to. According to Nahapiet and Ghoshal, (1998 p. 259) the concept of identification refers to the cognitive process through which individuals perceive themselves as being interconnected with another individual or a collective group. In the present investigation, the term "social identity" pertains to an individual's perception of affiliation and favourable sentiment towards the SDP organisation, akin to the concept of emotional identification as posited by Ellemers, Kortekaas and Ouwerkerk (1999).

Bagozzi and Dholakia (2002), in their research argued that social identification has a crucial role in promoting loyalty and citizenship behaviours within a group context. Additionally, they suggested that social identification can provide insights into individuals' inclination to sustain committed relationships with their team members. Social identity functions as a metric for assessing the degree of an individual's association with a certain collective. Social identity serves as a valuable resource that impacts the incentive to engage in the combination and sharing of knowledge (Nahapiet and Ghoshal, 1998). On the other hand, the presence of different and conflicting identities within groups poses major obstacles to the transmission of knowledge, learning, and the development of knowledge (Chiu, Hsu and Wang, 2006). Within SDP organizations, SDP managers' self-perception and their perception of fellow team members significantly influences their KT behavior (Buthelezi and Mkhize, 2015; Ellemers, Kortekaas and Ouwerkerk, 1999).

SDP organizations in Nigeria do not have full time SDP managers (Ramachandran et al., 2019). This issue adds to their behavior regarding sharing their expertise with the SDP team members and their sense of belonging. Individual self-perception is constructed based on his past experiences, whether they have been positively acknowledged or criticized for sharing knowledge (Buthelezi and Mkhize, 2015). Given that valuable knowledge is embedded in individuals and people usually tend to hoard the knowledge (Mubarak, Khan and Atasya Osmadi, 2022), one would not contribute his knowledge unless another person is recognized as his group-mate and the contribution is conducive to his welfare. A team-centric perspective may lead members to prioritize collective benefits over individual concerns, exemplified by a willingness to undertake risks for the team's perceived well-being, especially when a strong social identity with the team is established (Ellemers, Kortekaas and Ouwerkerk, 1999). In a nutshell, social identification has been included in this study and is assumed to have a significant impact on the KT behavior of SDP managers. Therefore, another hypothesis is formulated:

H3. There is a significant relationship between social identity and SDP manager's KT behavior.

2.3.4 Shared language

Shared language is the degree in which participants believe others share their language, goals and values. It is viewed as a bonding mechanism that helps different parts of an organization to integrate or combine resources (Tsai and Ghoshal, 2017). SDP managers who share a common vision with their team members are more likely to form partnerships and exchange ideas and resources. Lesser and Storck (2001) clarify that shared language encompasses more than just the language itself; it also delves into the acronyms, subtleties, and underlying assumptions that are essential components of daily communication. Shared codes and language enable a common understanding of collective objectives and suitable behaviours in SDP organizations (Tsai and Ghoshal, 2017).

Nigerian organizations is characterized by rich diversity of languages, ethnic groups, and cultural norms, shared language represents a critical factor that can significantly influence the KT behaviour of SDP managers. It provides an avenue in which SDP manager and his team understand each other and build common vocabulary in their domains (Chiu, Hsu and Wang, 2006). The diverse linguistic and ethnic landscape in Nigeria can pose communication barriers, hindering the seamless transfer of knowledge. Hence, the presence of a shared language, or the lack thereof, can either facilitate or impede KT practices (Omotayo and Babalola, 2016). When a shared language exists, it can bridge linguistic and cultural divides, enhancing mutual understanding and trust among individuals, ultimately fostering more effective KT practices (Khoza and Bwalya, 2021).

In the absence of a shared language, efforts to transfer knowledge may be hampered by misunderstandings and communication challenges, potentially limiting the effectiveness of KT behavior. Accordingly, having a common language not only facilitates the exchange of ideas but also improves the effectiveness of communication between individuals with comparable experiences or backgrounds (Omotayo and Babalola, 2016). Therefore, using the same language will encourage participants to actively participate in KT activities and improve the calibre of knowledge that is conveyed. Based on this the next hypothesis is postulated:

H4. There is a significant relationship between shared language and SDP manager's KT behavior.

2.3.5 Social interaction

Social interaction is defined as any relationship between two or more individuals. Chiu, Hsu and Wang (2006) stated that social interaction encompasses various aspects such as the intensity of relationships, the duration of engagement, and the regularity of communication within a community. It refers to the extent to which individuals within a community possess pre-existing social connections. Empirical evidence from many studies (Liu and Liu, 2008; Omotayo and Babalola, 2016; Wasko and Faraj, 2005) substantiates the impact of social interaction on the process of KT among individuals. Social interaction provides the opportunity to integrate and transfer knowledge, impact the availability and exchange of expertise, and predict the value that will arise from these interactions (Hall, 2003). Social interaction ties is described by Tsai and Ghoshal (2017) as portals for the sharing of resources and knowledge. On the other hand, clarify that social interaction ties among community members offer an affordable way to acquire a wider range of knowledge sources (Liang, Liu and Wu, 2008).

In Nigeria, resource limitations may affect the ability of SDP managers to engage in social interactions and KT practices effectively. Unsuitable outdated technological infrastructure, and the reluctance to use the available collaboration tools are some of the obstacles that reduces social interaction which has an impact on KT behavior of SDP managers in Nigeria (Babalola and Omotayo, 2017). In previous research strong social interactions have been found to positively affect KT practices. Therefore, stronger social interaction enables quicker exchange of

knowledge leading to the conclusion that social interaction correlates with KT behaviour of SDP managers. Thus, it is hypothesized that:

H5. There is a significant relationship between social interaction and SDP manager's KT behavior.

2.3.6 Reciprocity

The concept of reciprocity, according to Nowak (2000), relates to "the evolutionary basis for cooperation in society." In the words of Molm, (2010), one of the vital components of social exchange is reciprocity. SDP teams frequently collaborate on the same project, ensuring that their subsections of work may be merged into the required system (Jennings and Finkelstein, 2010). In Nigeria's software development landscape, SDP managers often view their knowledge as a means of job security and tend to operate in silos, reciprocity emerges as a critical factor influencing KT behaviour. In this situation, in order to collaborate effectively, each would need to know what the other is doing and how they are going about it (Buthelezi and Mkhize, 2015). As a result, for members of the team to effectively engage in the knowledge sharing process as part of their everyday job responsibilities, a bilateral agreement of exchange is required (Molm, 2010).

Reciprocity entails to the give-and-take dynamic in knowledge sharing, where individuals are more willing to transfer their expertise when they perceive a fair exchange of knowledge or anticipate benefits in return (Cropanzano and Mitchell, 2005). This interaction should be mutual (Molm, 2010). In Nigeria, SDP managers may not prioritize KT practices as it is not part of their job description and therefore due to the work overload, shortage of skilled team members (Ramachandran et al., 2019) there is a tendency to work independently. Fostering a reciprocal environment becomes essential. Thus, a culture of mutual knowledge exchange, where SDP managers understand the benefits of collaborative information sharing, can counteract siloed practices. The reciprocity of the interaction is emphasized by several authors (Biloslavo and Lombardi, 2021; Jhamba and Steyn, 2021; Rese, Kopplin and Nielebock, 2020) as a factor that influences KT behavior of an individual. This leads to the following hypothesis:

H6. There is a significant relationship between reciprocity and SDP manager's KT behavior.

2.3.7 Security and privacy

A security breach refers to an occurrence in which an organization or company experiences the loss of critical information, personal records, or other forms of sensitive data (Bishop, 2003). The integration of storage and computing within a shared multi-user project environment has heightened security concerns (Shin, 2010). Security encompasses the protection of services, datacentres, and associated resources, while also addressing the privacy and confidentiality of a company's data (Ilvonen, 2013). It also entails effectively managing potential information losses and the associated costs (Winkler, 2007). In contrast, privacy pertains to an individual's ability to exercise control over the flow and exchange of personal data (Shin, 2010). This concept can be understood as individuals, groups, or institutions asserting their rights to determine how information about them is communicated to others. In SDP environments, where privacy concerns loom large, SDP managers are less inclined to disclose personal information due to perceived threats and a lack of control over their data (Gupta and Xu, 2010).

In Nigeria, where online crimes and cyberattacks are common, security and privacy concerns can affect socialization and KT behaviours (Ardo, Bass and Gaber, 2023; Benjamin and Foye, 2022; Njenga et al., 2020). Security directly influences user behaviour affecting KT practices (Shin, 2010). User awareness regarding information security and privacy plays a pivotal role in shaping the way individuals use the KT system. Dinev and Hu (2007), found that heightened technology awareness leads to a more favourable user behavioural inclination to adopt protective technologies against information security threats. Therefore, security and privacy concerns are included in the framework as a factor that affects socialization which influences the transfer of SDP managers' knowledge. Thus, our hypothesis is as follows:

H7. There is a significant relationship between security and privacy and SDP manager's KT behaviour.

2.3.8 IT infrastructure

Alavi and Leidner (2001) stated that IT infrastructure encompasses machinery, systems, and ITs that facilitate three fundamental functions: encoding and disseminating best practices, establishing corporate knowledge repositories, and establishing knowledge networks. IT infrastructure serves as an essential facilitator, holding a central role in an organization's knowledge management system (Islam, Jasimuddin and Hasan, 2015). It plays a critical part in both sharing existing knowledge and fostering the creation of new knowledge by integrating

various technological platforms. Accordingly, SDP organizations should have IT infrastructures such as repositories that allow managers to store their tacit knowledge. Consequently, managers should allow team access to project organizational databases. Since knowledge may be implicit or explicit. Explicit knowledge is merely the type of knowledge that is documented. Access to databases and repositories enables personnel to investigate explicit knowledge that has been stored and transmitted, thereby facilitating externalization through the use of information technology (Dei, 2017; Nold, 2009).

Implementing technological innovations is difficult and expensive for SDP organizations in developing countries such as Nigeria (OC&C Consulting, 2018), where reoccurring issues related to disparities in internet access, deficit IT infrastructure, scarcity of hardware and software, little technical support, and a lack of technological resources (Adeleke, 2020; Ramachandran et al., 2019) is a big challenge for SDP managers. Technological entrepreneurs in Nigeria find it difficult to maintain this IT infrastructure for a long period of time (Adeleke, 2021; OC&C Consulting, 2018). Hence it is evidence that IT infrastructure affects the KT behavior of SDP manager in Nigeria. Other studies in different contexts have also supported this argument (Dei, 2017; Frost, 2012; Mikulecky and Lodhi, 2009; Rice and Rice, 2005). Therefore, this study includes IT infrastructure as a factor that is critical for implementing KT practices for SDP managers in Nigeria. Therefore, the following hypothesis was proposed:

H8. There is a significant relationship between IT infrastructure and SDP manager's KT behaviour.

2.3.9 Knowledge transfer behaviour

The literature frequently employs the terms "KT behaviour" and "KT" interchangeably, without establishing a clear distinction between the two ideas. KT involves the transmission of knowledge from a source to potential recipients, with the critical requirement that the recipients fully grasp and utilize the knowledge to guide their actions (Srisuksa, Wiriyapinit and Bhattarakosol, 2022). KT behavior refers to the extent to which individuals, groups, or organizations actively impart their expertise and exchange task-related ideas, information, and suggestions (Liang, Liu and Wu, 2008). The concept of KT behavior, which encompasses both cognitive and psychological components, is defined as "the degree to which one has positive feelings concerning sharing one's knowledge" (Brock et al., 2005, p. 91). The psychological aspect considers motivational and emotional factors, suggesting that interactions between SDP managers and their colleagues can be highly stimulating, enjoyable, or rewarding (Hsu et al., 2007).

Empirical evidence suggests that positive past interactions can create affective memory traces, which enhance future collaborative experiences (Khoza, 2018; Rese, Kopplin, & Nielebock, 2020). Effective KT helps avoid repeating mistakes or reinventing existing systems, ultimately saving time and improving the efficiency of SDPs (Wiewiora et al., 2009). The role of SDP managers is particularly critical, as their behavior significantly influences how well knowledge is shared and applied (Argote & Ingram, 2000; Ko, Kirsch, & King, 2005; Matthew & Dhillon, 2020). While each project brings its own innovations, leveraging lessons from previous work can offer valuable advantages. Without structured KT practices, teams often start from scratch, missing out on insights that could streamline project execution (Wiewiora et al., 2009). Encouraging proactive KT behaviors among SDP managers is therefore key to enhancing project outcomes.

3. Research Method

This work used a survey research design and specifically targeted the demographic of SDP managers in the Federal Capital Territory (FCT) Abuja and Lagos state, Nigeria. Abuja and Lagos are Nigeria's primary hubs for software development, hosting numerous IT companies and startups. Focusing on software development project managers in these cities provides insights into the country's tech industry. Given the absence of a sample frame for the population of SDP managers in these cities, convenience expert sampling and snowball methods were employed to choose respondents. An appropriate sample size was determined using G*Power software based on established statistical guidelines. The input parameters included an effect size of 0.35, an alpha error probability of 0.05, a statistical power (1- β error probability) of 0.95, and eight predictors. These parameters align with the recommendations of Faul et al. (2007) for determining the minimum sample size required for behavioral research. The analysis yielded a required sample size of 74 responses, ensuring sufficient statistical power to detect meaningful effects and minimize the risk of Type II errors. In all, 160 completed responses were collected, surpassing the pre-established sample size. An 80% response rate was achieved by distributing 200 copies of a structured questionnaire to the respondents, of which 160 copies were collected and deemed suitable for data collection and analysis.

The survey was carefully designed, integrating adjustments to questions derived from prior research on SCT and SECI framework. The questionnaire was divided into two separate sections. The first part gathers demographic data about the participants, whereas the second part collects information on the main variables of the research. The data collection measures for work motivation, trust to share, reciprocity, and KT behaviour in this section were derived from the works of Ko, Kirsch and King (2005) and Rese, Kopplin and Nielebock (2020). Measurements for social identity, shared language, and social interaction were obtained from the work of Chiu, Hsu and Wang, (2006). The security and privacy measurements were taken from Gupta, Fernandez-Crehuet and Gupta, (2022); Gupta and Xu, (2010), while the IT infrastructure measures were derived from the work of Islam, Jasimuddin and Hasan (2015). Each variable was measured using a five-point Likert interval scale. The questionnaire's validity was established by distributing the instruments to experts in the field of study, who provided feedback and suggestions for refinement. Specific components were then revised and restructured based on their recommendations (see Appendix). Construct validity was assessed through factor analysis technique (principal component analysis). Additionally, internal consistency and reliability were evaluated using Cronbach's alpha. Constructs with higher alpha values, indicating greater reliability for measuring variables, were selected. Each item included in the study exhibited a scale loading exceeding 0.70, meeting the criteria for acceptable alpha values (Table 1).

The study was carried out in accordance with rigorous ethical standards that regulate the appropriate activities in social research. Consideration was given to the respondents' entitlement to confidentiality and privacy during the development and administration of the questionnaire. Appropriate measures were taken to safeguard the respondents from any circumstances that may constitute a risk to their well-being, and they were granted the autonomy to decide whether or not to take part in the study. Coding and analysis of the data obtained from the questionnaire were conducted using the Statistical Package for Social Sciences (SPSS) software, Version 20. Summaries of the socio-demographic characteristics of the respondents were obtained using descriptive statistics. To assess the relationship between the independent and dependent variables, multiple regression analysis was conducted, a method previously utilized in KT studies within SDP (Khoza and Bwalya, 2021).

Table 1: Alpha value for adopted and modified scales

Constructs	Number of items	Alpha value
Knowledge transfer (KT)	4	0.882
Work motivation (WM)	5	0.743
Trust to share (TS)	5	0.866
Social identity (SID)	4	0.724
Shared language (SL)	3	0.724
Social interaction (SI)	4	0.840
Reciprocity (RE)	3	0.830
Security and privacy (SP)	4	0.741
IT Infrastructure (ITF)	4	0.882

4. Data Analysis

4.1 Descriptive Analysis

This section presents descriptive statistics derived from the data collected through the questionnaire. Table 2 displays the demographic characteristics of the respondents. Out of all the participants, 61.9% were males and 38.1% were females. The survey shows that the majority of the participants work with diverse SDP organizations. The participants work with the following project organizations: Custom software development firm (24.4%); Open-source software development company (21.3%); Mobile application development company (19.4%); Health care IT company (16.2%); E-commerce/Fintech software company (15.6%); and (3.1%) which accounts for others.

Table 2: Demographic characteristics of participants

Gender	Category	Frequency	Percentage
	Male	99	61.9%
	Female	61	38.1%

	Total	160	100%
Educational qualification	Diploma	24	15%
	Bachelor's degree	71	44.4%
	Postgraduate's degree	51	31.9%
	Others	14	8.8%
	Total	160	100%
Type of SDP organization	Custom based	39	24.4%
	Open source	34	21.3%
	Mobile application	31	19.4%
	Healthcare based	26	16.2%
	E-commerce/Fintech	25	15.6%
	Others	5	3.1%
	Total	160	100%
Years of experience	1-5 years	51	31.9%
	6-10 years	60	37.5%
	11-20 years	28	17.5%
	Above 20 years	21	13.1%
	Total	100	100%

4.2 Hypothesis Test

To address this research objective, multiple regression analysis was used to test the hypothesis. The regression analysis was to examine the relationship between the independent variable (predictor variables) and the dependent variable of significant relationships between the dependent and independent variables. The findings are outlined in Table 3. The dependent variable being measured was KT behavior. The following are the independent variables that are shown in the table: Work Motivation (WM), Trust to Share (TS), Social Identity (SID), Shared Language (SL), Social Interaction (SI), Reciprocity (REC), Security and Privacy (SP), and Information Technology Infrastructure (ITF). The predetermined threshold of significance was set at 5 percent (%); if the acquired p-value was < 0.05 , the hypothesis is significant. Conversely, if the obtained p-value was > 0.05 , the hypothesis is not significant.

The hypothesis test if work motivation carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable WM to test the hypothesis H_1 . WM significantly predicts KT, $F(8, 359) = 318.331$, $p < 0.001$, which indicates that WM can play a significant role in shaping KT behavior ($\beta = 0.344$, $p < .001$). The hypothesis test if trust to share carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable TS to test the hypothesis H_2 . TS significantly predicts KT, $F(8, 359) = 318.331$, $p < 0.001$, which indicates that TS can play a significant role in shaping KT behavior ($\beta = 1.014$, $p < .001$). The hypothesis test if social identity carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable SID to test the hypothesis H_3 . SID did not significantly predict KT, $F(8, 359) = 318.331$, $p > 0.001$, which indicates that SID did not play a significant role in shaping KT behavior ($\beta = 0.070$, $p < .256$).

The hypothesis test if shared language carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable SL to test the hypothesis H_4 . SL did not significant predict KT, $F(8, 359) = 318.331$, $p > 0.001$, which indicates that SL did not play a significant role in shaping KT behavior ($\beta = -0.009$, $p < .818$). The hypothesis test if social interaction carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable SI to test the hypothesis H_5 . SI significantly predicts KT, $F(8, 359) = 318.331$, $p < 0.001$, which indicates that SI can play a significant role in shaping KT behavior ($\beta = 0.233$, $p < .001$). The hypothesis test if reciprocity carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable RE to test the hypothesis H_6 . RE did not significantly predict KT, $F(8, 359) = 318.331$, $p > 0.001$, which indicates that RE did not play a significant role in shaping KT behavior ($\beta = -0.469$, $p < .818$).

The hypothesis test if security and privacy carry a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable SP to test the hypothesis H₇. SP significantly predicts KT, $F(8, 359) = 318.331$, $p < 0.001$, which indicates that SP can play a significant role in shaping KT behavior ($\beta = 0.383$, $p < .001$). The hypothesis test if IT infrastructure carries a significant impact on KT behavior. The dependent variable KT was regressed on predicting variable ITF to test the hypothesis H₈. ITF significantly predicts KT, $F(8, 359) = 318.331$, $p < 0.001$, which indicates that ITF can play a significant role in shaping KT behavior ($\beta = 0.260$, $p < .001$). These results clearly direct the positive effect of the ITF.

The R^2 value measures the extent to which the predictor variables account for the variation in the endogenous variable. Cohen (1988) categorized R^2 value of 0.02 as weak, 0.13 as moderate, and 0.26 as strong respectively. Moreover, the R^2 values from the present study is 0.859, which indicates that the research model explains 85.9% of the overall variance in KT behavior. Therefore, this study's R^2 value of 85.9% is considered strong, indicating a good predictive accuracy in accordance with Cohen's (1988) criterion. Table 3. shows the summary of the findings.

Table 3: Test for hypothesis and findings

Hypothesis	Regression Weights	Beta (β)	t-value	p-value	Hypotheses Supported
H1	WM→KT	1. 0.344	2. 7.021	3. 0.000	Yes
H2	TS→KT	4. 1.014	5. 12.992	6. 0.000	Yes
H3	SID→KT	7. 0.070	8. 1.147	9. 0.252	No
H4	SL→KT	10. -0.009	11. -0.230	12. 0.818	No
H5	SI→KT	13. 0.233	14. 7.292	15. 0.000	Yes
H6	RE→KT	16. -0.036	17. -0.725	18. 0.469	No
H7	SP→KT	19. 0.383	20. 6.187	21. 0.000	Yes
H8	ITF→KT	22. 0.260	23. 6.877	24. 0.000	Yes

Note * $p < 0.05$. WM: Work Motivation, TS: Trust to Share, SID: Social Identity, SL: Shared Language, SI: Social Interaction, RE: Reciprocity, SP: Security & Privacy, ITF: IT Infrastructure, KT: Knowledge Transfer.

5. Discussion

The findings of this study provide important insights into the factors influencing KT behavior among SDP managers in Nigeria. The demographic analysis reveals that most respondents hold bachelor's degrees (44.4%), followed by postgraduate degrees (31.9%), diplomas (15%), and other qualifications (8.8%). Additionally, participants had varying levels of experience, with 37.5% having 6–10 years, 31.9% with 1–5 years, 17.5% with 11–20 years, and 13.9% possessing more than 20 years of experience. This diversity in expertise highlights the potential for experienced SDP managers to facilitate KT within project teams.

The study found that work motivation, trust to share, social interaction, security and privacy, and IT infrastructure significantly influence KT behavior among SDP managers. However, social identity, shared language, and reciprocity did not have a significant impact. Work motivation was positively associated with KT behavior, aligning with previous studies that suggest motivated employees are more willing to transfer knowledge when they perceive tangible or intrinsic benefits (Davidavičienė, Al Majzoub and Meidute-Kavaliauskiene, 2020; Riaz, Buriro and Mahboob, 2019). The findings support the idea that the presence of incentives, recognition, and career advancement opportunities enhances SDP managers' willingness to transfer knowledge. This is consistent with research in South Africa, which found that managers are hesitant to share knowledge without appropriate rewards (Khoza, 2018). Without structured motivation mechanisms, knowledge hoarding may persist, limiting organizational learning and innovation.

Trust to share also exhibited a strong and statistically significant correlation with KT behavior, reinforcing the notion that trust fosters a conducive knowledge-sharing environment (Omotayo and Babalola, 2016; Ren et al., 2019). This result aligns with Srisuksa, Wiriapinit and Bhattarakosol (2022) argument that trust is foundational to effective KT, particularly in knowledge-intensive industries such as SDP. The findings further confirm the relevance of SCT, which suggests that individuals are more likely to engage in KT practices when they trust that their shared knowledge will not be misused or exploited (Bandura, 1986). In the Nigerian context, where concerns over job security and competitive advantage are prevalent, SDP managers may be reluctant to share knowledge without confidence in their team members' integrity and reliability (Omotayo and Babalola, 2016).

Contrary to expectations, social identity did not significantly influence KT behavior. Previous studies suggested that individuals who strongly identify with their teams are more likely to share knowledge (Chiu, Hsu and Wang, 2006; Yu, Lu and Liu, 2010). However, the lack of significance in this study may stem from the nature of project-based employment in Nigeria, where many SDP managers work across multiple projects and do not form deep affiliations with a single organization. Additionally, Nigerian SDP managers may prioritize professional competence and project outcomes over social identification, unlike team members who rely more on group cohesion for knowledge exchange (Buthelezi and Mkhize, 2015).

Similarly, shared language did not significantly impact KT behavior, diverging from previous studies that identified a strong link between common language and knowledge-sharing efficiency (Alam et al., 2009; van den Hooff and Huysman, 2009). A possible explanation is Nigeria's linguistic diversity, where English serves as the primary business language, reducing the importance of a shared mother tongue in SDP organizations. Furthermore, SDP managers may prioritize technical accuracy and structured documentation over verbal communication, reducing reliance on shared language for KT practices.

Social interaction was positively correlated with KT behavior, supporting the view that frequent interaction enhances knowledge exchange (Babalola and Omotayo, 2017; Chiu et al., 2006). Regular engagement with team members fosters trust, facilitates mentorship, and encourages informal KT, which aligns with the SECI model's emphasis on socialization as a key component of knowledge creation (Nonaka and Takeuchi, 1995). In Nigeria, where informal mentorship often plays a crucial role in professional development, fostering social interactions through team-building activities and collaborative platforms can enhance KT effectiveness (Stampfl, Prodingner and Palkovits-Rauter, 2024).

Unexpectedly, reciprocity did not significantly influence KT behavior. While past research posited that individuals share knowledge in anticipation of reciprocal benefits (da Silva, Mosquera and Soares, 2022; Wasko and Faraj, 2005), the findings suggest that SDP managers do not perceive reciprocity as a necessary condition for KT practice. This may be attributed to the hierarchical structure of Nigerian organizations, where managers are expected to transfer knowledge without necessarily receiving equal knowledge in return (Li, Shankar and Stallaert, 2020). Additionally, SDP managers may share knowledge as part of their professional responsibilities rather than based on mutual exchange expectations (Sharma and Stol, 2020).

Security and privacy were found to have a significant impact on KT behavior, corroborating previous studies that highlighted concerns over information protection as a barrier to knowledge-sharing (Gifford, 2009; Gordon and Loeb, 2006). Nigerian SDP managers may be particularly cautious due to the high prevalence of cyber threats and data breaches, making them reluctant to share knowledge without adequate security measures in place (Govindarajan and Gupta, 2002). This underscores the need for organizations to invest in secure digital platforms to foster trust in KT processes (Shin, 2010).

Finally, IT infrastructure was positively associated with KT behavior, reinforcing the importance of technological tools in facilitating efficient knowledge exchange (Dei, 2017; Frost, 2012). The findings align with previous research in the UAE and other developing economies, where IT infrastructure significantly enhanced KT practices (Davidavičienė, Al Majzoub and Meidute-Kavaliauskiene, 2020). However, Nigerian SDP organizations face challenges in adopting advanced IT solutions due to infrastructural deficiencies and high implementation costs (OC&C Consulting, 2018). Government support and strategic investment in IT infrastructure could mitigate these challenges and promote seamless knowledge-sharing among SDP managers. The study's findings contribute to KT and SDP research by confirming the influence of work motivation, trust, social interaction, security, and IT infrastructure while challenging the assumed significance of social identity, shared language, and reciprocity.

6. Conclusion

This research makes a significant contribution to KT literature by providing empirical insights into the factors influencing KT behavior among SDP managers, particularly within the context of a developing nation like Nigeria. Given the critical role of SDPs in driving technological and economic advancements, understanding KT practices is essential for enhancing project efficiency, knowledge retention, and innovation. The study offers practical implications for SDP managers by identifying key enablers to KT, highlighting the need for cultivating trust, fostering social interaction, and ensuring robust IT infrastructure to facilitate effective KT practices.

From a practical standpoint, the findings can inform SDP managers in implementing targeted strategies to enhance KT. For instance, organizations should foster reciprocal knowledge-sharing cultures by integrating structured mentorship programs and incentivizing knowledge exchange through performance-based rewards. Additionally, the study underscores the importance of informal social interactions such as team-building

exercises and collaborative workshops as a means to build trust and encourage open knowledge exchange. While shared language did not exhibit a direct effect on KT, promoting common terminologies and standardized communication frameworks within SDP teams can enhance clarity and reduce misunderstandings. Similarly, IT infrastructure investments, including secure digital collaboration platforms, can mitigate security and privacy concerns, ensuring knowledge is transferred in a protected environment.

Beyond organizational applications, this study holds relevance for policymakers and stakeholders involved in SDP initiatives. Policymakers should consider providing regulatory frameworks that incentivize KT behaviors, including tax reliefs for companies that invest in structured KT programs. Furthermore, the study suggests that government intervention could play a moderating role in strengthening IT infrastructure, an area that future research could explore empirically. In terms of broader contributions, the study's insights extend beyond Nigeria particularly to other developing economies facing similar SDP challenges. Comparative studies with countries in regions such as South Asia, Latin America, and Africa could validate and refine the proposed KT model, making it a globally adaptable model. Furthermore, investigating KT behaviors across different SDP structures such as agile development teams could provide more nuanced findings applicable to diverse organizational settings.

Despite its contributions, the study acknowledges certain limitations, including a relatively small sample size and the use of convenience expert sampling, which may restrict the generalizability of the findings to only SDP managers. Future research should address these constraints by employing larger, more diverse samples, including entire SDP teams, and exploring alternative methodological approaches such as longitudinal studies or experimental validation of the proposed KT model. Additionally, incorporating the moderating effects of top management support and exploring sector-specific variations in KT behavior would provide a deeper understanding of how knowledge flows within SDP environments. In conclusion, while this study offers valuable contributions to KT literature and SDP management practices, further research is essential to refine and expand its applicability. By addressing the identified limitations and exploring new dimensions of KT behavior, future studies can enhance the theoretical and practical understanding of knowledge transfer in software development projects worldwide.

Declaration of Conflict of Interest, Ethical Compliance, and Use of AI Tools: The authors declare that there are no conflicts of interest related to the publication of this research. They confirm compliance with all ethical standards, addressing concerns such as plagiarism, research misconduct, informed consent, data fabrication or falsification, duplicate publication or submission, and redundancy. Additionally, the authors state that basic AI tools were used solely to assist with paraphrasing and proofreading during the writing process. All content was thoroughly reviewed and edited by the authors to ensure accuracy, originality, and academic integrity.

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Appendix: Table

Construct	Items	Sources
Knowledge transfer behaviour	In my organization	Rese, Kopplin and Nielebock (2020)
	1. I frequently share my knowledge with others	
	2. I regularly tell others what I am doing.	
	3. I know what the others are doing.	
	4. I immediately tell others about it, when I learn something new.	
Work motivation	1. I am willing to share my knowledge because it can enhance my reputation	Ko, Kirsch and King (2005)
	2. I think that sharing my knowledge makes my colleagues better aware of my skills.	
	3. I consider that my organization recognizes/values those who share knowledge.	
	4. I consider that my organization provides its members with a fair evaluation/reward system for sharing knowledge	
	5. I think that sharing knowledge has a direct impact on the progression of my career.	
Trust to share	in my organization	Rese, Kopplin and Nielebock (2020)
	1. All team members are honest and sincere dealing with me about knowledge.	
	2. Nobody takes advantage of my knowledge of my knowledge.	
	3. All members deal constructively and carefully with my information.	
	4. The information I receive is accurate at all times.	
	5. All members always keep their promises to me.	
Social identity	1. I feel a sense of belonging with the team members in my organization.	(Chiu, Hsu and Wang, 2006)
	2. I have the feeling of togetherness or closeness with my team members.	
	3. I have a strong positive feeling toward the team members in my organization.	
	4. I am proud to be a team member in my organization.	
Shared language	1. Team members in my organization use common terms.	(Chiu, Hsu and Wang, 2006)
	2. Team members in my organization use understandable communication pattern during discussion.	
	3. Team members in my organization use understandable narrative forms to share information.	
Social interaction	1. I maintain close social relationships with some team members of my organization.	
	2. I spend a lot of time interacting with some team members in my organization.	
	3. I know some team members in my organization on a personal level.	
	4. I have frequent communication with some team members in my organization.	
Reciprocity	1. When I receive help from my team members, it is only right to help the others as well.	Rese, Kopplin and Nielebock (2020)
	2. Team members in my organization would help me if I needed it.	
	3. Solidarity between team members is a high priority in my organization.	

Construct	Items	Sources
Security and privacy	My organization provides facilities that:	(Gupta, Fernandez-Crehuet and Gupta, 2022; Gupta and Xu, 2010)
	1. Helps in the secure storage of my data.	
	2. Ensures data protection so that it can not be manipulated by hackers outside the organization.	
	3. Ensures protection of usage of official data by team members for their personal benefit.	
	4. Makes me feel comfortable sharing my knowledge with my team members.	
IT Infrastructure	My organization uses technology that allows:	Islam, Jasimuddin and Hasan (2015)
	1. Employees to collaborate with team members inside the organization.	
	2. Employees to collaborate with team members outside the organization.	
	3. Employees from multiple loactions to learn as a group from a single source.	
	4. Employees to retreive and use knowledge about software development project.	