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TECHNOLOGICAL READINESS, INNOVATIVE WORK BEHAVIOUR, AND BOUNDARY INTEGRATION IN GHANA'S PUBLIC SECTOR

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ABSTRACT

Purpose: This study investigates the impact of technological readiness (TR) on innovative work behaviour (IWB) among public sector employees in Ghana, with a focus on the moderating role of boundary integration behaviour (BIB). The Job Demands-Resources (JD-R) Theory is employed to clarify these relationships.
Design/Methodology/Approach: Data were collected from 484 public sector employees through structured sets of questionnaires using a quantitative research design. The study employed partial least squares structural equation modelling (PLS-SEM) to analyse the relationships between TR, IWB, and BIB.
Findings: The results indicate that technology motivators (optimism and innovativeness) significantly enhance IWB, while technology inhibitors (discomfort and insecurity) do not have a statistically significant adverse impact as anticipated. Additionally, BIB positively moderates the relationship between technology motivators and IWB but not between technology inhibitors and IWB.
Research Limitation: The study is limited to public sector employees in Ghana, which may affect the generalizability of the findings. Future research could explore similar relationships in different cultural and organisational contexts.
Practical Implication: To enhance innovation, organisations should promote a positive technological environment and support work-life balance. This can be achieved by promoting technological motivators and encouraging positive boundary management practices.
Social Implication: Boosting IWB in the public sector can improve public services and yield societal benefits, contributing to overall national development.
Originality/Value: This study provides empirical evidence from a developing country context, contributing to Africa's limited knowledge on public sector innovation. It highlights the importance of TR and BIB in enhancing innovation among public sector employees.

Keywords*: Behaviour. innovative. readiness. technological. work*

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INTRODUCTION

Technological advancements have fundamentally reshaped the global work environment, altering the skills and competencies required in the labour market. Organisations, particularly within the public sector, are increasingly relying on technological innovations to enhance efficiency, transparency, and service delivery (Millard, 2017). In Ghana, the public sector is pivotal in socio-economic development, serving as a critical provider of essential services and infrastructure. Recognising the potential of digital transformation, the Ghanaian government has embarked on numerous digitisation initiatives, including the implementation of the Ghana Card, the Digital Address System, and the Mobile Money Interoperability platform (Agbeko et al., 2021; Ayakwah et al., 2021). These initiatives are aimed at improving public service delivery and positioning Ghana as a digital leader in Sub-Saharan Africa (Dzisah, 2022).

Despite these advancements, such digital initiatives' success heavily depends on public sector employees' readiness to adopt and effectively utilise new technologies. Technological readiness (TR), which refers to an individual's propensity to embrace and use new technologies, is a crucial factor influencing how employees engage with technological tools and, consequently, how they innovate within their roles (Blut & Wang, 2020). While technology can be a powerful enabler of innovation, not all employees are equally prepared or willing to embrace its challenges and benefits. This discrepancy in readiness can significantly impact the overall innovative capacity of an organisation (Blut & Wang, 2020; Homayoun et al., 2024).

The public sector in Ghana presents a unique context for examining the relationship between technological readiness and innovative work behaviour (IWB). The sector's pivotal role in national development, coupled with the government's investment in digital transformation, creates fertile ground for exploring how employees' attitudes towards technology influence their ability to innovate. However, the literature on this topic remains sparse, particularly within the African context. Previous studies have primarily focused on the policy and institutional aspects of digitisation in the public sector, often overlooking the human and behavioural dimensions that are critical to understanding the success of these initiatives (Ayakwah et al., 2021). The sole exception to the prevailing behavioural trend is the study by Kumi et al. (2024). Their research examined the impact of the unidimensional aspect of technology readiness on employees' adaptive behaviours and reported positive outcomes (Kumi et al., 2024).

This study addresses this gap by exploring how technological readiness influences innovative work behaviour among public sector employees in Ghana. Drawing on the Job Demands-Resources (JD-R) theory, the research examines how technology motivators (such as optimism and innovativeness) and inhibitors (such as insecurity and discomfort) affect employees' propensity to innovate. The JD-R theory provides a robust framework for understanding how

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job resources, like technological readiness, can enhance employee well-being and performance, particularly in fostering innovation. It posits that job resources are essential in promoting work engagement and mitigating job demands' adverse effects, enabling employees to perform better and engage in innovative activities (Koroglu & Ozmen, 2022; Zia et al., 2024).

A critical aspect of this study is examining boundary integration behaviour (BIB) as a moderating variable. Boundary integration refers to an individual's ability to manage and harmonise their work and personal lives (Kossek et al., 2012). The study posits that high boundary integration can amplify the positive effects of technology motivators on innovative work behaviour by reducing conflict and enhancing employees' ability to leverage technological resources effectively. Conversely, low boundary integration may exacerbate the negative impacts of technology inhibitors, leading to increased stress and reduced innovation.

The research presented in this study holds considerable importance for various reasons. First, it extends the concept of technological readiness from the consumer domain, where it has been extensively studied, to the employee domain, specifically within the public sector. This extension is crucial as it provides a more nuanced understanding of how employees' attitudes towards technology influence their work behaviours. Second, by focusing on the Ghanaian public sector, the study offers empirical evidence from a developing country context, contributing to the limited body of knowledge on public sector innovation in Africa (AlEssa & Durugbo, 2022). Third, the study's findings have practical implications for public sector managers and policymakers, offering insights into how technological readiness can be enhanced to foster a more innovative workforce.

The study is organised as follows: The next section reviews the relevant literature and develops the hypotheses. The third section describes the research methodology, including the data collection and analysis. The fourth section unveils the results and discusses the findings, highlighting their implications. The final section concludes the study and provides limitations and directions for future research.

THEORIES UNDERPINNING THE STUDY

The Job Demands-Resources (JD-R) Theory

The Job Demands-Resources (JD-R) Theory provides a robust framework for understanding the dynamics between job demands, job resources, and their impact on employee well-being and performance. This theory can be applied to explain the relationships explored in this study, which examines how technological readiness (TR), IWB, and boundary integration (BI)

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behaviours interact within the context of the Ghanaian public sector. The JD-R Theory posits that every job has specific risk factors associated with job stress, categorised into job demands and resources. Job demands refer to a job's physical, psychological, social, or organisational aspects that require sustained physical or psychological effort, thus having certain physiological and psychological costs (Bakker & Demerouti, 2014). Instances include high work pressure, emotional demands, and role ambiguity. On the other hand, job resources refer to those physical, psychological, social, or organisational aspects of the job that are functional in achieving work goals, reducing job demands, and stimulating personal growth, learning, and development (Tummers & Bakker, 2021). Examples include job control, colleague support, and professional development opportunities.

In the context of this study, technological readiness can be seen as a critical job resource that influences IWB. Employees ready to adopt and utilise new technologies will likely view them as resources that facilitate their work, reduce effort, and enhance performance. On the other hand, technology inhibitors represent job demands that can impede work processes and lead to stress and reduced innovation. The study hypothesises that technology motivators have a positive relationship with IWB. According to JD-R Theory, when employees perceive high levels of job resources, such as positive attitudes towards technology, they are more likely to be engaged, motivated, and capable of innovative behaviours (Dixit & Upadhyay, 2021). These motivators enhance perceived behavioural control and perceived benefits, encouraging employees to adopt new technologies and engage in innovative practices. This aligns with the hypothesis that technology motivators increase IWB by providing psychological and cognitive resources. Conversely, technology inhibitors are hypothesised to have a negative relationship with IWB. From the JD-R perspective, these inhibitors act as job demands that increase stress and hinder performance. Employees who experience high levels of discomfort or insecurity with technology are likely to be less engaged and more resistant to change, reducing their capacity for innovation (Tummers & Bakker, 2021). This stress can detract from their ability to integrate new technologies effectively, thereby stifling innovation.

Boundary integration, which involves managing and harmonising work and personal life, moderates the relationship between technological readiness and innovative work behaviour. High boundary integration can amplify the positive effects of technology motivators by reducing conflict and enhancing employees' ability to leverage resources effectively (Amah et al., 2021; Piszczek, 2017). When employees can balance their work and personal roles, they are more likely to feel empowered and less stressed, which enhances their capacity for innovation (Ali et al., 2022). Equally, high boundary integration can also mitigate the adverse effects of technology inhibitors. Employees who effectively manage their work-life boundaries are better equipped to handle the demands and stresses associated with new technologies (Stephen et al., 2024; Tochia, 2021). This reduces the adverse impact of discomfort and insecurity, thereby sustaining and even enhancing innovative behaviours despite the presence of technological inhibitors.

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The JD-R Theory provides a comprehensive framework for understanding how technological readiness influences IWB in the Ghanaian public sector. This study can elucidate how these factors affect employee innovation by viewing technology motivators as job resources and technology inhibitors as job demands. Moreover, the moderating role of boundary integration behaviour highlights the importance of managing work-life boundaries to optimise the positive impacts of technological readiness and mitigate its challenges. This theoretical framework offers valuable insights for enhancing innovation through strategically managing job demands and resources in public sector organisations.

Workplace Technology Preparedness

Workplace technology readiness is crucial for adopting and effectively using new technologies. Parasuraman initially proposed the concept of TR to understand individuals' propensity to embrace and utilise advanced technologies. TR was initially conceptualised with four dimensions, but later research refined it into a two-dimensional construct: technology motivators (innovativeness and optimism) and technology inhibitors (discomfort and insecurity) (Parasuraman & Colby, 2015). Technology motivators reflect an individual's openness to new ideas and willingness to adopt novel technologies. Innovators are enthusiastic about technological advancements, and optimistic individuals expect favourable outcomes from using new technologies. On the other hand, technology inhibitors describe individuals who experience discomfort or insecurity with new technologies, leading to resistance or reluctance to adoption (Parasuraman & Colby, 2015). Recent studies emphasise the significance of distinguishing between these motivators and inhibitors. A meta-analysis by Blut and Wang (2020) found that motivators have a more substantial impact on technology usage than inhibitors, suggesting that fostering positive attitudes toward technology can enhance workplace adoption. Additionally, employees with high TR are more likely to adapt to digital transformations, improving performance and job satisfaction (Abdul Hamid, 2022). This adaptability is influenced by factors such as job meaningfulness and proactive personality. Moreover, the relationship between TR and technology acceptance is moderated by factors like the type of technology, organisational support, and cultural context (Blut & Wang, 2020). Understanding and enhancing TR is essential for successful digital transformation, and organisations should create supportive environments that foster positive attitudes toward technology while addressing potential inhibitors.

Boundary Integration Behaviour

Boundary integration is how individuals balance and harmonise their work and personal lives (Brough et al., 2020). It stems from the concept of work-life balance, which involves maintaining a dynamic equilibrium between one's professional and personal life. It involves individuals' actions to manage work effectively and non-work roles, such as flexible work

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arrangements, technology-mediated communication, and adaptation strategies (Bulger & Hoffman, 2018). BIB is essential for individual well-being and job satisfaction. It reduces stress, increases life satisfaction, and improves mental and physical health (Reinke & Gerlach, 2022). It also enhances job performance and productivity, as individuals can focus on tasks without stress from unmanaged boundaries (Bouckenooghe et al., 2022). Organisations that support BIB can benefit from increased employee engagement, reduced absenteeism, and improved recruitment and retention (Yasir & Majid, 2019). These benefits lead to a healthier and more productive workforce (Kossek et al., 2021). BIB has challenges, such as conflicting work demands, a lack of flexibility support, and blurred work-personal life boundaries due to technology (Yasir & Majid, 2019). BIB has facilitators, such as work-life balance policies and culture, time management skills, and personal boundaries. Mobile devices and telecommuting tools enable individuals to blend their work and personal lives more seamlessly.

Innovative Work Behaviour

Innovative work behaviour is critical for organisational success in dynamic and competitive environments. IWB encompasses the generation, introduction, and application of new ideas by employees, which can significantly enhance an organisation's competitive advantage and sustainability (AlEssa & Durugbo, 2022). Research on IWB has evolved from focusing on individual personality traits and characteristics to a more comprehensive understanding of the behaviours and processes involved in innovation. (AlEssa & Durugbo, 2022). A systematic review by Bos-Nehles et al. (2017) highlights the role of Human Resource Management (HRM) practices in fostering IWB. Critical HRM practices, including training and development, job security, autonomy, and feedback, are essential for fostering employees' innovative behaviours (Bos-Nehles et al., 2017). Another significant contribution is the work by AlEssa and Durugbo (2021), which provides a multidimensional framework for understanding IWB. This framework integrates various research concepts and contributions, comprehensively analysing the factors that drive IWB. Overall, the literature suggests that encouraging an environment that supports autonomy, provides adequate resources, and encourages continuous learning is essential for promoting innovative work behaviour among employees.

Technology Motivators and Innovative Behaviour

Research has shown that perceived behavioural control, which refers to an individual's perception of their ability to perform a behaviour, positively affects the intention to adopt and use technology. (Park & Huang, 2017). When employees perceive that they have control over using technology effectively, they are more likely to engage in innovative behaviours (Clack, 2021; Luo et al., 2023). Employees are motivated by the perceived benefits of using technology. These benefits may include increased efficiency, improved communication, and

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enhanced productivity (Schmid & Dowling, 2020). Employees who recognise these advantages are more likely to embrace technology and exhibit innovative behaviours. Research indicates that perceived behavioural control significantly influences technology adoption and usage. When employees feel confident in their technology use, they are more likely to engage in innovative behaviours (Granić, 2024). For instance, a study on e-learning adoption found that high perceived behavioural control increases confidence in successfully using technology, fostering innovative behaviours (Khan & Qudrat-Ullah, 2021). Similarly, a longitudinal study on AI adoption in higher education revealed that perceived behavioural control positively predicts changes in technology usage, supporting the link between control and innovation (Polyportis, 2024). Employees are motivated by the tangible benefits of using technology, such as increased efficiency, improved communication, and enhanced productivity. These perceived benefits encourage employees to embrace technology and engage in innovative behaviours. For example, the World Economic Forum highlights how technology boosts productivity and transforms operations, leading to more significant innovation (Granić, 2024). Additionally, research on the human-centric benefits of technology emphasises how improved communication and connectivity empower employees to innovate (Polyportis, 2024). It is therefore suggested that:

H1: *Technology motivators have a positive relationship with workers' innovative behaviours.*

Technology Inhibitors and Innovative Behaviours

High perceived costs such as financial investment, time, or effort associated with adopting and using technology can act as inhibitors. Employees may resist innovation if they perceive that the costs outweigh the benefits. (Min & Lea, 2023; Oyetade et al., 2020). Therefore, technology inhibitors can negatively impact innovative behaviours. Anxiety related to technology use can hinder employees from exploring new ways of working. Fear of making mistakes, unfamiliarity with technology, or concerns about privacy and security can create anxiety. When employees experience high levels of anxiety, they are less likely to engage in innovative behaviours (Firth et al., 2018; Popescu et al., 2022). Technostress, a closely related concept to technology inhibitors, which arises from the inability to adapt to new technologies, can significantly impact employee well-being and innovative behaviours. A study by Hang et al. (2022) found that technostress negatively affects employees' well-being, which in turn reduces their capacity for innovation (Blut & Wang, 2020). The study also highlighted that technostress inhibitors, such as organisational support and training, can mitigate these adverse effects, suggesting that reducing technostress is crucial for fostering innovation. Again, studies have demonstrated that these inhibitors negatively impact technology usage and, consequently, innovative behaviours (Hang et al., 2022). The study suggests that addressing these inhibitors through supportive measures can enhance employees' readiness to adopt new technologies and engage in innovative activities. In sum, technology inhibitors such as perceived cost and anxiety can

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hinder them. Organisations should focus on minimising inhibitors and promoting motivators to foster a culture of innovation among employees. It is therefore suggested that:

H2: *Technology inhibitors have a negative relationship with employees' innovative behaviours.*

Moderating Role of Boundary Integration on The Relationship Between Technology Motivators and Innovative Work Behaviour

Boundary integration refers to an individual's ability to manage and integrate work-related and non-work-related roles and responsibilities effectively (Kossek et al., 2012). When employees can successfully navigate these boundaries, they are more likely to engage in innovative work behaviour because they feel less conflicted and more empowered (Kmieciak, 2021; Yasir & Majid, 2019; Zhu et al., 2023). Moreover, motivators such as perceived benefits, ease of use, and positive attitudes toward technology encourage employees to adopt and use technology effectively (Abdul Hamid, 2022). When boundary integration is high, employees can leverage these motivators more effectively, leading to increased IWB (Yasir & Majid, 2019). Thus, boundary integration acts as a moderator between technology motivators and IWB. Consequently, when employees experience high boundary integration, the positive impact of technology motivators on IWB is amplified (Schmid & Dowling, 2020).

Furthermore, boundary integration can lead to work-to-family enrichment, where positive experiences in one role improve the quality of life in another. This enrichment can enhance employees' well-being and job satisfaction, making them more likely to engage in IWB. When employees feel supported in balancing their work and personal lives, they are more motivated to leverage technology for innovative solutions. (Canedo et al., 2017; Picolo et al., 2023). This positive spillover effect strengthens the relationship between technology motivators and IWB (Yasir & Majid, 2019). Additionally, strong co-worker and supervisor support can further enhance the benefits of boundary integration. Indeed, supportive work environments enable employees to manage their roles more effectively, reducing stress and increasing their capacity for innovation (Tripathi & Kalia, 2024). Therefore, when boundary integration is high, and employees receive adequate support, they are better positioned to utilise technologies to drive IWB (Zafar et al., 2024). Ultimately, this supportive context could amplify the moderating effect of boundary integration on the relationship between technology motivators and IWB. It is therefore suggested that:

H3: *Boundary integration behaviours moderate the positive relationship between technology motivators and innovative work behaviour.*

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Moderating Role of Boundary Integration on The Relationship Between Technology Inhibitors and Innovative Work Behaviour

Technological inhibitors can include perceived costs, such as financial, time, and effort, along with anxiety and fear associated with technology adoption (Dekkal et al., 2023; Mkhonto & Zuva, 2023). Moreover, when boundary integration is low, these inhibitors have a more substantial adverse effect on IWB because employees struggle to manage conflicting demands and stress related to technology use (Damar & Koksalmis, 2023; Richter & Sinha, 2020). In contrast, when boundary integration is high, employees can effectively balance work and non-work roles, reducing the impact of technology inhibitors on IWB. As a result, they are better equipped to handle challenges and adapt to technological changes (Derks et al., 2016). Furthermore, effective boundary integration allows employees to maintain a healthy work-life balance, which reduces stress and enhances overall well-being. For instance, a study found that employees who manage their work and personal roles effectively are less likely to experience burnout and more likely to engage in innovative behaviours (Allen et al., 2014). This balance helps employees be more creative and open to new ideas, even with technology inhibitors. Additionally, high boundary integration provides employees with more explicit role definitions and expectations, which can reduce the ambiguity and stress associated with technology adoption. Accordingly, a study found that employees with well-integrated boundaries better manage role transitions and adapt to new technologies (Kossek et al., 2012). This adaptability reduces the negative impact of technology inhibitors on IWB, as employees feel more confident and supported in their roles. In sum, boundary integration shapes the relationship between technology inhibitors and IWB. Organisations should consider promoting boundary integration to enhance IWB and mitigate the effects of technology-related factors. We therefore suggest that:

H4: *Boundary Integration Moderates the Negative Association between Technology Inhibitors and Innovative Work Behaviour.*

CONCEPTUAL MODEL

The study's conceptual model examines the relationship between technological readiness (technology motivators and inhibitors) and innovative work behaviour among public sector employees in Ghana. The framework is grounded in the Job Demands-Resources (JD-R) Theory, which posits that TR acts as a critical job resource that can enhance IWB. The study also explores the moderating role of boundary integration behaviour, proposing that high BI can increase the positive effects of technology motivators on IWB. It also suggests that high BI might reduce the negative influence of technology inhibitors on IWB. This model highlights the importance of promoting a supportive technological environment to drive innovation in the public sector.

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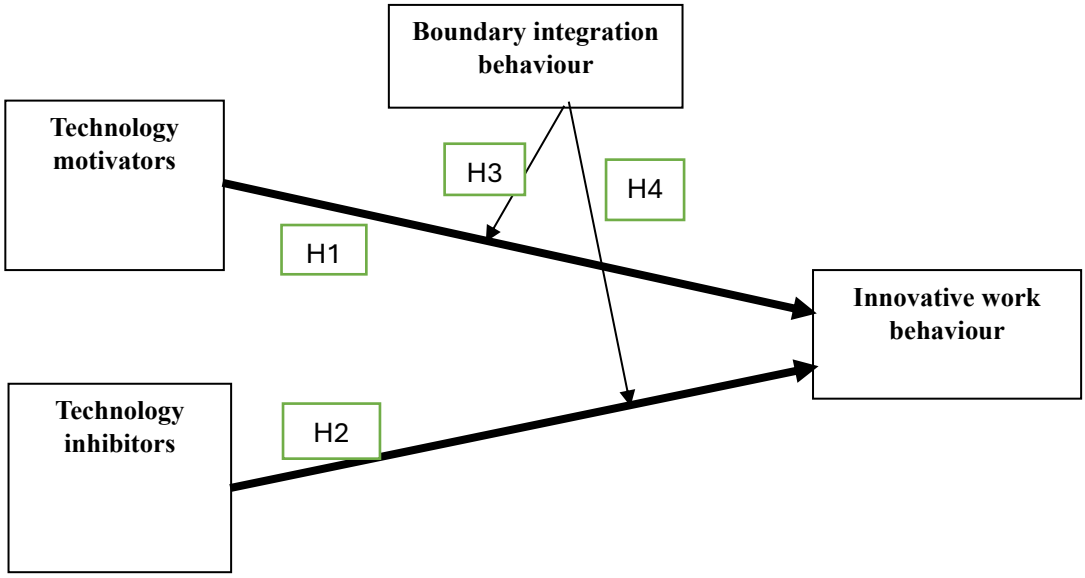

Figure 1: Research model

METHOD

Sample and Data Collection

The descriptive study collected data from Ghanaian public-sector entities. To reduce method bias, data was collected at two-time points, one for employees and one for supervisors (Podsakoff et al., 2003). Nineteen public entities were surveyed. Human resource officers in each participating firm served as study coordinators to help researchers reach personnel in the surveyed organisations from whom we randomly chose respondents. Two study assistants working with one author gave respondents questionnaires to fill out at work. All questions were coded to make identifying an employee's questionnaire easier and connecting it to their supervisors' responses across all collection points. Initially, 700 public sector professionals were surveyed regarding demographics, technology readiness, and boundary integration behaviour. They were then asked to provide the names of their supervisors, who received separate questionnaires to evaluate their subordinates' IWB. Only those participants whose supervisors completed the IWB ratings were included in the final analysis. Ultimately, 484 usable questionnaires were collected and utilised for the study.

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We used a cross-sectional research design to investigate the relationship between technology readiness, boundary integration, and IWB among public sector employees in Ghana. This design was chosen due to its suitability for describing current phenomena or testing associations among variables (Bryman, 2016), as opposed to the costly, time-consuming, and attrition-prone longitudinal design (Saunders, 2012). The cross-sectional design was chosen for its alignment with the research objectives and practicality, making it more feasible and suitable for examining causal effects (Hunziker & Blankenagel, 2024). After two collection periods, 484 employees and 95 supervisors completed valid surveys for a 69% response rate. The study sampled more women (56%) than men. Half of the participants were first-degree holders, while 37% had master's degrees. Most of the respondents (59%) were married. The data collection process and sample demographics set the stage for analysing the relationship between the researched components among Ghanaian public sector workers.

Measures For the Study Variables

Boundary Integration behaviour: BIB was assessed using a 10-item scale developed by Kossek et al. (2012). For example, " I usually bring work materials when I attend personal or family." The construct demonstrated strong reliability, with a Cronbach's alpha of 0.850.

Technology Readiness: TR was measured at time 2 using a 16-item scale by (Parasuraman & Colby, 2015). Participants rated their agreement on a scale from 1 (strongly disagree) to 5 (strongly agree), with items reflecting technology motivators (optimism and innovativeness) and inhibitors (discomfort and insecurity). A sample item is, " I keep up with the latest technological developments in my areas of interest." The Cronbach's alphas for the two dimensions were 0.807 for technology motivators and 0.691 for technology inhibitors, indicating high internal consistency and reliability.

Innovative Work Behaviour: IWB was evaluated using the 10-item scale developed by (De Jong & Den Hartog, 2010). Supervisors rated their employees' IWB on a 5-point Likert scale, ranging from 1 ('Never') to 5 ('Always'). An example item is, "I attempt to convince people to support an innovative idea." The construct exhibited high reliability, evidenced by Cronbach's alpha of 0.825.

Data Analysis

This research utilised a cross-sectional design and employed several strategies to mitigate common method bias (CMB), ensuring it did not compromise the findings. In line with established guidelines, we carefully crafted survey items to avoid ambiguity and complexity, ensuring that none of the constructs were susceptible to external influences during data collection (Cobern & Adams, 2020). Additionally, we randomised the order of survey questions to reduce the potential for CMB further (Podsakoff et al., 2003). To assess the impact of method

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variance on the relationships among variables, we calculated the variance inflation factor (VIF). While there is no universally agreed-upon minimum VIF threshold for detecting CMB in SmartPLS analyses, various perspectives suggest that a VIF value of 3 or higher might indicate CMB (Kock, 2015). In our study, the VIF values ranged from 1.636 to 1.725, indicating that CMB was not a significant concern. These VIF results are detailed in Table 5.

To explore how technology motivators and inhibitors affect innovative work behaviours and how boundary integration behaviours moderate these associations, we employed partial least squares structural equation modelling (PLS-SEM). PLS-SEM is a versatile statistical method that enables researchers to examine complex relationships between latent constructs and their observable indicators (Hair Jr et al., 2017). This approach was particularly suited to our study for several reasons. Primarily, PLS-SEM is a causal-predictive technique aimed at explaining variance in endogenous latent variables, aligning with the research goals (Hair Jr, 2021), PLS-SEM is also adept at handling both reflective and formative measurement models, which was crucial for this study, given our use of only reflective constructs (Hair Jr et al., 2017).

Furthermore, PLS-SEM accommodates a wide range of sample sizes and does not require specific data distribution assumptions (Hair et al., 2019). Our sample of 484 public sector employees in Ghana exceeded the minimum sample size requirements for PLS-SEM (Hair et al., 2014). Lastly, PLS-SEM effectively manages missing data through the expectation-maximization algorithm, a robust method for imputing missing values (Hair et al., 2019). With less than 5% missing data, this analysis remained valid (Hair et al., 2014). The PLS-SEM process involves two key steps: evaluating the measurement and structural models. We conducted the analysis using Smart PLS Version 3.0, employing a two-stage measurement and structural modelling approach, including testing for moderation effects within our model.

RESULTS AND DISCUSSION

Evaluation of The Measurement Model

To assess the reliability of reflective measurement models, researchers first examine how much variance each indicator's construct explains. An indicator is deemed reliable if it explains more than 50% of the variance, indicating satisfactory commonality (Hair & Sarstedt, 2021). Nevertheless, it is important not to automatically remove indicators with loadings below 0.70, as doing so could affect the model's internal consistency and overall reliability. Researchers should also consider additional reliability and validity measures, removing indicators with loadings between 0.40 and 0.708 only if they compromise internal consistency reliability (Hair & Sarstedt, 2021). The results of the measurement model are presented in Table 1.

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Table 1: Convergent Validity

Constructs	Codes	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Factor Loadings
BIB	BI1 BI2 BI4 BI5 BI7 BI8 BI9	0.850	0.886	0.526	0.762 0.775 0.732 0.668 0.718 0.692 0.725
IWB	IWB1 IWB2 IWB3 IWB4 IWB5 IWB6 IWB7	0.825	0.873	0.535	0.668 0.819 0.707 0.669 0.757 0.757 0.668
TI	TI2 TI3 TI4 TI6	0.691	0.811	0.518	0.718 0.738 0.705 0.717
TM	TM1 TM2 TM3 TM6 TM7 TM8	0.807	0.810	0.509	0.680 0.751 0.742 0.672 0.724 0.708

Source: Authors field data.
Note: *BIB*=Boundary integration behaviour, IWB=Innovative work behaviour, *TI*=Technology inhibitors, *TM*=Technology motivators.

This analysis retained some indicators with loadings under 0.70, such as 0.680 and 0.672 for TM, 0.668 and 692 for BI, and 0.668 and 0.669 for IWB. The model's suitability for the constructs' reliability and validity was checked using Cronbach's alpha and composite

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reliability. Except for TI, which had a Cronbach alpha of 0.691, all other measures exceeded the acceptable level of 0.7 (Nunnally, 1994), with Cronbach's alpha ranging from 0.807 to 0.850 and composite reliability from 0.810 to 0.886. Convergent validity was also confirmed by the Average Variance Extracted (AVE) values, which were all above 0.5 (Cheung et al., 2024), as shown in Table 1. The study used these and other metrics to evaluate the reliability and validity of the reflective measurement models, ensuring that the constructs reflected the underlying theory.

Researchers typically evaluate discriminant validity to confirm that different constructs are distinct. As shown in Table 1, all measures in this study had factor loadings exceeding 0.5, indicating their reliability. By comparing latent variable correlations to the square root of the Average Variance Extracted (AVE), the analysis confirmed that each latent construct explained more variance with its indicators than with those of other constructs (Henseler et al., 2016). The bolded values in the columns and rows highlight these higher correlations, validating the model's discriminant validity. Henseler et al. (2016) argue that the Heterotrait-Monotrait Ratio (HTMT) method is more effective than the Fornell-Larcker criterion and cross-loadings due to its greater sensitivity and specificity (Fornell & Larcker, 1981). However, Table 2 shows that the HTMT values are close to one, indicating a lack of discriminant validity.

Table 2: Heterotrait-Monotrait Ratio (HTMT)

Constructs	**BIB**	**IWB**	**TI**	**TM**
Boundary Integration Behaviour				
Innovative Work Behaviour	**0.704**			
Technology Inhibitors	0.709	**0.648**		
Technology Motivators	0.681	0.747	**0.775**	

Note: The bolded numbers are the square root of the AVE values

EVALUATION OF THE STRUCTURAL MODEL

After confirming the reliability and validity of the constructs, it is recommended that the structural model assessment be proceeded with in PLS-SEM research (Shmueli et al., 2019). The initial step involves checking for collinearity issues within the structural model, which can influence point estimates and standard errors. To assess this, the VIF values of the predictor constructs in each regression are examined (Hair Jr et al., 2021). As shown in Table 3, the model does not present any collinearity issues. The next step is to evaluate the significance of the path coefficients by considering the R^2 values, which should exceed 0.1 (Chin, 1998; Hair et al., 2011).

The PLS-SEM analysis shows that the R^2 value is 0.479, meaning that the predictors and the moderator collectively explain approximately 48% of the variance in innovative work behaviour. The adjusted R^2 value of 0.476, which accounts for the number of predictors and

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sample size, confirms that about 48% of the variance in IWB is explained by the predictors (technology motivators and inhibitors) and the moderator (boundary integration). In conclusion, the R^2 and adjusted R^2 values consistently indicate that nearly half of the variability in IWB can be attributed to the specified predictors and moderators. For moderation analysis, it is crucial to report effect sizes, with the interaction effect size (f^2) being especially significant (Memon et al., 2019; Sarstedt et al., 2022). The effect size measures how much the endogenous construct is influenced by moderation, with conventional thresholds for small, medium, and large effect sizes set at 0.02, 0.15, and 0.35, respectively (Cohen, 1988). However, studies indicate that the average effect size in moderation tests is just 0.009 (Aguinis et al., 2005). Table 3 displays the acceptable effect sizes based on the F-square values.

The subsequent step in the methodology involves evaluating the model's predictive power. The PLSpredict metric is employed to gauge the model's effectiveness in forecasting dependent variables from independent variables (Shmueli et al., 2016). When examining prediction errors, emphasis should be placed on the primary endogenous construct rather than all endogenous construct indicators (Shmueli et al., 2019). Prediction errors are quantified using the Root Mean Square Error (RMSE) and the Mean Absolute Error (MAE). A lower RMSE indicates better model performance. The model demonstrates strong predictive relevance, as shown by the relatively low prediction errors for IWB (RMSE = 0.722, MAE = 0.549).

Table 3: Saturated Model Results

Constructs	**R2**	**Adjusted R2**	**VIF**	**PLS predict**		**F2**
				RSME	**MAE**	
BIB			1.636			0.135
IWB	0.479	0.476		0.722	0.549	
TI			1.669			0.012
TM			1.725			0.149

VIF=variance inflation factor, RSME=Root Mean Square Error, MAE= Mean Absolute Error*, PLSpredict (Q2), predictive relevance; F2=effect size, R=, determination of coefficient*

Structural Equation Modelling

To evaluate the significance of the correlations between the dependent and independent variables in the direct effects analysis, a bootstrapping algorithm with 5000 subsamples was employed. The analysis utilised the Bias-Corrected and Accelerated Bootstrap confidence interval method, applying a two-tailed test with a significance level 0.05. The results are depicted in Figure 2.

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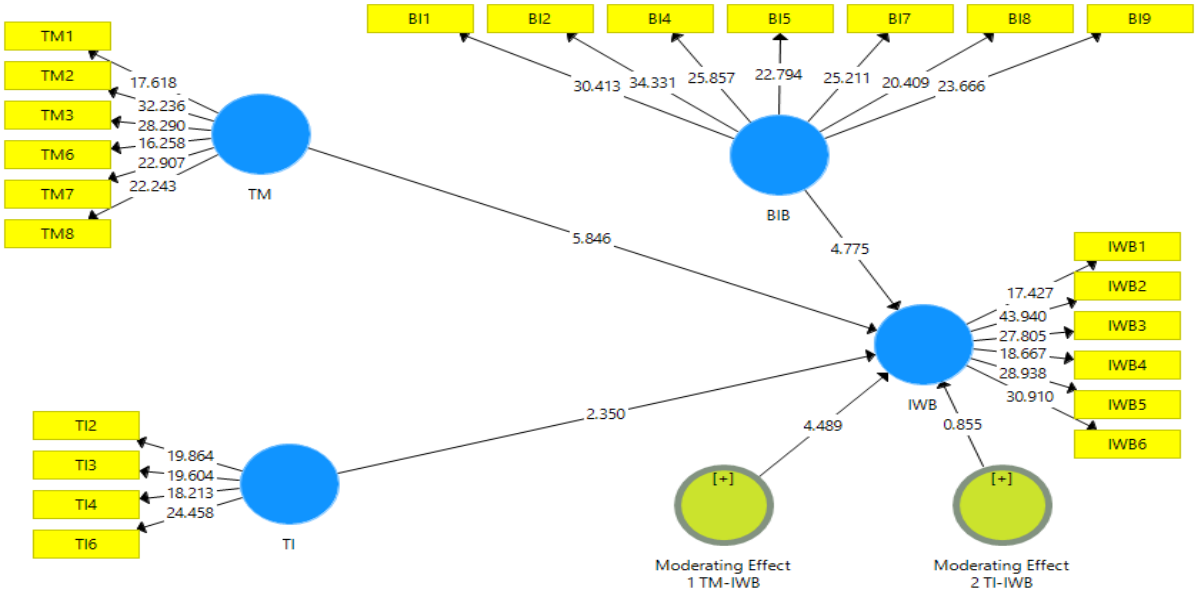

Figure 2: Structural model assessment.

Note: *BIB*= Boundary integration behaviour, IWB= Innovative work behaviour, TI= technology inhibitors, TM=Technology Motivators.

Hypothesis 1 suggested a positive association between technology motivators and IWB. The results supported this assertion (**β** = 0.307, **p** < 0.000). Hypothesis 2 proposed a positive and negative effect of technology inhibitors on IWB. This notion was not supported by the data (**β** = 0.118, **p** < 0.019) even though the relationship was statistically significant and positive, and it does not support the suggested hypothesis. Hypothesis 3 proposed a moderating influence of boundary integration behaviour on the relationship between technology motivators and IWB, supported by the results (**β** = 0.143, **p** < 0.000). Hypothesis 4 suggested a moderation effect of boundary integration on the relationship between technology inhibitors and IWB. The results did not support the hypothesis (**β** = -0.029, **p** < 0.393). This indicates that boundary integration behaviour does not influence the association between technology inhibitors and IWB of Ghanaian public sector employees.

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Table 4: Structural model assessment (Direct and moderated effect results and decisions)

Hypothesis	Paths	Beta	T-value	P-value	Decision
H_1	TM→IWB	0.307	5.846	0.000	Supported
H_2	TI→IWB	0.118	2.350	0.019	Not Supported
H_3	TM*BIB→IWB	0.143	4.489	0.000	Supported
H_4	TI*BIB→IWB	-0.029	0.855	0.393	Not Supported

Note: ***TI****=Technology Inhibitors,* ***TM****=Technology motivators,* ***BIB****= Boundary integration behaviour, IWB= innovative work behaviour. P<0.05 and T-statistic value > 1.65*

This study explored the relationships between technological readiness, innovative work behaviour, and boundary integration behaviours within the Ghanaian public sector. Using the Job Demands-Resources (JD-R) theory as the theoretical framework, the research provides several insightful findings that contribute to the literature on organisational behaviour and technology adoption.

Key Findings

The Direct Relationship Between Technology Motivators and Innovative Work Behaviour (H1)

The results indicate that technology motivators, such as optimism and innovativeness, significantly positively affect innovative work behaviour among public sector employees. This finding aligns with previous research that emphasises the role of positive psychological states in promoting innovation (Blut & Wang, 2020; Luo et al., 2023). Employees who perceive technology as beneficial and are optimistic about its potential are more likely to engage in behaviours that drive innovation within their organisations. This underscores the importance of fostering a work environment that encourages positive attitudes towards technology, which can be achieved through training, organisational support, and clear communication about the benefits of technological adoption.

The Direct Relationship Between Technology Inhibitors and Innovative Work Behaviour (H2)

Conversely, the study found that technology inhibitors did not have a statistically significant negative impact on IWB. This outcome challenges some previous assumptions in the literature (Hang et al., 2022; Oyetade et al., 2020) and suggests that inhibitors may not be as detrimental to innovation as previously thought in the Ghanaian public sector context. This unexpected positive relationship between technology inhibitors and IWB, despite Hypothesis 2 predicting a negative effect, suggests that some perceived barriers might challenge employees to become more innovative. This counterintuitive finding implies that organisations could benefit from creating environments with mild challenges or obstacles, encouraging employees to develop

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creative solutions. In the lens of the JDR model, technology inhibitors can be viewed as job demands that hinder employees, such as limited access to advanced technology and inadequate support systems. According to the JDR model, high job demands can lead to stress or burnout if employees lack the necessary resources, resulting in lower performance or innovation. However, the model also suggests that job demands can foster creativity and problem-solving when paired with adequate resources like employee resilience, skills, peer and supervisor support, or personal motivation (Moring & Moring, 2022; Pansini et al., 2023; Tummers & Bakker, 2021). An indication that in Ghana's public sector, employees often innovate as a coping mechanism for resource constraints, thinking outside the box to overcome technological inhibitors.

The Moderating Role of Boundary Integration on The Relationship Between Technology Motivators and Innovative Work Behaviour (H3)

Also, boundary integration behaviour mediated the relationship between technology motivators and IWB. Specifically, employees who effectively manage the boundaries between their work and personal lives are better able to leverage technologies to enhance their innovative behaviours. This finding aligns with the broader literature on work-life balance and its impact on job performance. (Kossek et al., 2021; Yasir & Majid, 2019). It suggests that public sector organisations in Ghana should prioritise policies and practices that support boundary integration, such as flexible work arrangements and telecommuting options, to foster a more innovative workforce. This finding can also be explained through the Job Demands-Resources model. The JDR model posits that job resources, including support systems, flexibility, and work-life balance mechanisms, play a critical role in motivating employees and enhancing job performance, including IWB (Tummers & Bakker, 2021; Van den Broeck et al., 2013). In this context, boundary integration behaviour is an essential resource that allows employees to effectively manage the demands of their professional and personal lives.

The Moderating Role of Boundary Integration on The Relationship Between Technology Inhibitors and Innovative Work Behaviour (H4)

The findings of this study indicate that boundary integration behaviour does not moderate the relationship between technology inhibitors and IWB among public sector employees in Ghana. This result suggests that the ability to manage and harmonise work and personal life does not influence how technology inhibitors impact employees' innovative behaviours. This outcome contrasts with the initial hypothesis, which posited that high boundary integration would mitigate the adverse effects of technology inhibitors on IWB. Interestingly, although Hypothesis 2 suggested a negative effect of technology inhibitors on IWB, the results showed

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a positive impact. This unexpected positive relationship implies that technology inhibitors might stimulate innovative behaviours, possibly due to employees perceiving technological challenges as opportunities to develop creative solutions. Consequently, it is unsurprising that boundary integration behaviour did not moderate the relationship between technology motivators and IWB. This could be attributed to the resilience employees have built to overcome technological stress, enabling them to thrive in their work environment. Additionally, this result highlights the complexity of the relationship between technology inhibitors and innovative behaviour. It suggests that other factors, such as organisational support, training, and individual resilience, might play more critical roles in mitigating the impacts of technology inhibitors. Therefore, public sector organisations should provide comprehensive support systems and resources to help employees overcome technological challenges and foster innovation.

While boundary integration is essential for overall well-being and job satisfaction, it may not be sufficient to offset the effects of technology inhibitors on IWB. Future research should explore additional moderating variables and interventions that can enhance employees' ability to innovate despite technological barriers.

CONCLUSION AND RECOMMENDATION

In conclusion, this study contributes to understanding how technological readiness influences innovative work behaviour in the Ghanaian public sector, focusing on the moderating role of boundary integration behaviour. The findings underscore the importance of fostering a positive technological environment and supporting work-life balance to enhance innovation among public sector employees. Public sector organisations can create a conducive environment for innovation by addressing both motivators and inhibitors of technology adoption, which is critical for improving public service delivery in an increasingly digital world. The study's insights are particularly relevant for policymakers and managers in the public sector, as they highlight the need for strategic interventions that enhance technological readiness and support innovative work behaviour. While its cross-sectional design and context-specific focus limit the study, it opens avenues for future research to explore these relationships in different settings and with a broader range of influencing factors. Fostering an innovative public sector workforce requires a holistic approach considering both work's technological and human dimensions.

Theoretical Contributions

This research extends the application of the JD-R theory by integrating it with the concept of technological readiness in the public sector context. The findings support the JD-R theory's

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assertion that job resources (e.g., technology motivators) can enhance employee well-being and performance, particularly in fostering innovation. Moreover, by examining the moderating role of boundary integration, this study contributes to the growing body of literature on the importance of work-life balance in enhancing employee outcomes.

Practical Implications

This study offers several practical implications for public sector organisations, particularly in Ghana. The findings highlight the importance of fostering a supportive environment that enhances employees' technological readiness, which in turn can drive IWB. Public sector managers should focus on strategies that boost employees' optimism and innovativeness towards technology. This can be achieved through targeted training programs, workshops, and continuous professional development that emphasise the benefits and ease of adopting new technologies. Moreover, the role of boundary integration behaviour in moderating the relationship between technological readiness and IWB suggests that organisations should also prioritise work-life balance initiatives. Implementing flexible work arrangements, such as telecommuting and flexible hours, can help employees better manage their work and personal responsibilities, enhancing their ability to innovate. By supporting employees in integrating their work and personal lives, organisations can reduce stress and foster an environment that encourages creativity and innovation. Finally, addressing technology inhibitors, such as discomfort and insecurity, is crucial. Public sector organisations should provide adequate support, including technical assistance, peer support systems, and stress management resources, to help employees overcome barriers to technology adoption. This will enhance their readiness to embrace new technologies and ensure they are equipped to contribute innovatively to the organisation.

Limitations and Future Research

Although this study offers important insights, it is essential to recognise its limitations. First, the cross-sectional design of the research limits the ability to draw causal inferences about the relationships between technological readiness, boundary integration, and innovative work behaviour. Future studies could employ longitudinal designs better to capture the dynamics of these relationships over time. Second, the study was conducted within the Ghanaian public sector, which may limit the generalisability of the findings to other contexts or regions. Future research could explore these relationships in different cultural or organisational settings to determine the broader applicability of the results. Additionally, examining how specific cultural factors influence technological readiness and IWB could provide deeper insights into the cross-cultural applicability of the findings. Although researchers gathered data from employees and their respective supervisors, future studies could benefit from incorporating more objective

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measures of innovative work behaviour and technological readiness. Additionally, collecting data from other sources, such as peer evaluations, could provide a more comprehensive understanding. Finally, future research could explore additional moderators and mediators that may influence the relationship between technological readiness and innovative work behaviour. For instance, organisational culture, leadership styles, and team dynamics could be examined to provide a more comprehensive understanding of the factors that drive innovation in the public sector.

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