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Improving Service Recovery Performance through Readiness for Technology Adoption and Structural Empowerment: Evidence from Software Houses of Pakistan

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Abstract
In the rapidly evolving global and Pakistani IT sectors, the challenge of integrating technology adoption with effective service recovery mechanisms has become increasingly prominent. This study addresses the gap in understanding how readiness for technology adoption (RTA), structural empowerment (SE), and top management commitment (TMC) collectively influence Service Recovery Performance (SRP) in Pakistani software houses. Utilizing a quantitative approach, the research quantitatively analyses the relationships between RTA, SE, SRP, and the moderating effect of TMC through a survey of employees within the sector. Findings reveal a positive relationship between RTA and SE, and between SE and SRP, affirming the pivotal role of structural empowerment in mediating the impact of technology readiness on service recovery. Moreover, TMC was found to significantly moderate the SE-SRP relationship, enhancing the effectiveness of empowerment practices in service recovery contexts. These results underscore the importance of cohesive strategies that incorporate technology readiness, employee empowerment, and management support to enhance service recovery outcomes. The study contributes to the literature by providing empirical evidence on the interconnected roles of RTA, SE, and TMC in improving SRP, particularly within the context of emerging markets. For policymakers and business leaders, this research highlights the necessity of fostering an organizational culture that supports technological advancements, empowers employees, and is backed by committed leadership to navigate service recovery challenges effectively, thereby sustaining customer satisfaction and competitive advantage.
Keywords: Service Recovery Performance, Readiness for Technology Adoption, Structural Empowerment, Top Management Commitment, Pakistani Software Houses, IT Sector, Emerging Markets

1. Introduction

In today's global marketplace, the rapid pace of technological advancement has become a defining characteristic of successful organizations. Studies indicate that firms which actively embrace technology adoption not only streamline their operations but also significantly enhance their market competitiveness. For instance, a 2020 report by the McKinsey Global Institute highlights that businesses at the forefront of technology adoption are 50% more likely to achieve market leadership and high profit margins compared to their less technologically advanced counterparts. This global trend underscores the importance of readiness for technology adoption (RTA) as a critical factor in the strategic positioning and operational efficiency of organizations across various industries (Reasheed, 2018; Ibrahim et al. 2023).

In Pakistan, the technology adoption landscape presents a unique set of challenges and opportunities for local businesses. According to a study by the Pakistan Software Houses Association for IT & ITES (P@SHA) in 2019, despite a growing IT sector contributing significantly to the GDP, many firms still grapple with adopting the latest technologies (Chen et al. 2021; Ibrahim et al. 2023). The report points out that only 20% of small to medium enterprises (SMEs) in Pakistan are engaged in adopting new technologies, a figure considerably lower than the global average. This hesitation is attributed to factors such as limited access to capital, lack of technical expertise, and resistance to change among employees (Ismail & Ali, 2017; Jonbekova et al. 2021). Such challenges underscore the pressing need for strategies that can enhance the readiness for technology adoption, structural empowerment, and ultimately, service recovery performance in the Pakistani context.

Service Recovery Performance (SRP), initially defined by Hart, Heskett, and Sasser in 1990, refers to an organization's ability to effectively address and rectify service failures, restoring customer satisfaction. Linking this concept to the global and Pakistani contexts discussed earlier, the challenges in technology adoption and structural empowerment significantly impact SRP. Globally, and especially in Pakistan, where technological advancement lags and structural empowerment is limited, the inability to effectively recover from service failures can exacerbate customer dissatisfaction and lead to a loss of competitive edge (Bibi, 2016; Hameed et al. 2021; Koc, 2019; Khan & Wali, 2019; Ullah & Sohail, 2019).

The importance of readiness for technology adoption (RTA) and structural empowerment (SE) in enhancing SRP cannot be overstated. RTA, by facilitating the integration of advanced technologies, can streamline service recovery processes, making them more efficient and effective (Huang et al. 2016; Jonbekova et al. 2021). For example, a global study found that firms with high RTA could reduce customer complaint resolution times by up to 30%. In the Pakistani context, where technical resource constraints prevail, enhancing RTA could significantly improve SRP, addressing one of the critical issues highlighted previously. Similarly, empowering employees through SE enables them to make quick decisions and take immediate action in service recovery scenarios, thus directly influencing SRP (Mao et al. 2022; Sivakumar & Kumar, 2017 Piaralal et al. 2016). Research has shown that empowered employees are more likely to exhibit ownership and go the extra mile to ensure customer satisfaction, a crucial element in service recovery. However, focusing solely on RTA and SE without considering the broader organizational culture and top management commitment (TMC) could potentially worsen existing issues. For instance, without TMC, efforts to improve RTA and SE might not be fully supported or effectively implemented, leading to half-hearted adoption processes and empowerment initiatives that do not translate into improved SRP.

The novelty of this study lies in its exploration of the relationship between RTA, SE, and SRP, with a particular focus on the moderating role of TMC, a relationship not extensively explored in existing literature, especially within the Pakistani context. This study differentiates itself through its methodology, employing a mixed-methods approach that combines quantitative analysis with qualitative insights, a departure from the predominantly quantitative or qualitative studies in this area (Paoletti et al. 2021).

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Additionally, the conceptual framework integrates TMC as a moderating variable, offering a new perspective on how top management's support influences the effectiveness of technology adoption and empowerment initiatives in improving SRP.

The results of this study contribute significantly to both academic knowledge and practical implications for policymakers and business leaders. By highlighting the critical role of TMC in enhancing the effectiveness of RTA and SE towards improving SRP, this research provides a roadmap for organizations, particularly in emerging markets like Pakistan, to navigate the complexities of service recovery in a technology-driven age.

The remainder of the paper is composed of a literature review that situates the study within the broader context of existing research, followed by a detailed methodology section explaining the mixed-methods approach. The results section presents the findings of the hypothesis testing, and the discussion section interprets these findings in light of previous research. Finally, the conclusion outlines the study's contributions to theory and practice, suggests implications for policymakers and business leaders, and proposes directions for future research.

2. Literature Review

2.1. Readiness for Technology Adoption

The concept of readiness for technology adoption is central to understanding how organizations embrace new technological advancements. Scholars have extensively studied this phenomenon, highlighting its significance in enhancing operational efficiencies and competitive advantage (Luo et al. 2018). Research indicates that an organization's proactive approach towards technology adoption can significantly influence its overall agility and responsiveness to market changes (Gökalp et al. 2022). This body of work emphasizes the importance of a strategic orientation towards technology, suggesting that readiness transcends mere preparedness, encompassing a cultural and psychological willingness to innovate and adapt.

2.2. Structural Empowerment

Structural empowerment has been identified as a critical factor in organizational behavior, contributing to job satisfaction, performance, and employee retention (Aggarwal et al. 2018; Hasan & Sadat, 2023). Empowerment practices are shown to foster an environment of trust and autonomy, enabling employees to make decisions and take actions that directly impact their work and the organization’s success (Pedro & Meiyanto, 2020). The literature suggests that empowered employees are more engaged, committed, and motivated, which in turn enhances organizational performance and adaptability (Aggarwal et al. 2018; Hammouri et al. 2021; Zaden, 2023). This line of research underscores the transformative power of empowerment in creating dynamic and resilient organizational cultures.

2.3. Service Recovery Performance

Service recovery performance has emerged as a pivotal area of study within service management literature, emphasizing the importance of effectively addressing service failures to maintain customer satisfaction and loyalty (Harun et al. 2018). Studies in this domain have explored various strategies and practices that organizations can employ to recover from service failures, highlighting the role of employee behaviour, organizational support systems, and customer communication in the recovery process (Harrison, 2019). The consensus among researchers is that effective service recovery can turn dissatisfied customers into loyal ones, underscoring the strategic value of investing in robust service recovery mechanisms.

2.4. Top Management Commitment

The role of top management commitment in organizational success is a well-documented theme across management research. This body of literature explores how leadership commitment influences strategic direction, organizational culture, and operational priorities (Karim & Qamruzzaman, 2020). Studies have shown that top management’s support for initiatives such as technology adoption, empowerment practices, and service recovery efforts significantly impacts their effectiveness and sustainability (Amin et al. 2018; Li et al. 2018). The research highlights the critical role of leadership in modelling values, setting expectations, and providing the resources necessary for organizational achievements.

Service Recovery Performance (SRP) is deemed crucial both in specific contexts and globally due to its direct impact on customer retention, loyalty, and the overall reputation of businesses. Studies have shown that effective service recovery can transform negative customer experiences into positive outcomes, significantly enhancing customer satisfaction and loyalty levels (Kadhem & Hafedh, 2021). This transformation is critical in today’s global marketplace, where social media and online reviews can amplify the impact of customer experiences, both positive and negative.

The relationship between variables such as Readiness for Technology Adoption (RTA), Structural Empowerment (SE), and Top Management Commitment (TMC) with SRP has been explored to varying extents in literature. RTA and SE are often viewed as drivers of SRP, suggesting that organizations better prepared for technological changes and those that empower their employees can more effectively manage and recover from service failures (Xu et al. 2019). Similarly, TMC has been shown to play a crucial role in supporting these activities, directly influencing the success of service recovery strategies (Calleja-González et al. 2019; Xu et al. 2019).

Despite the extensive research, a missing link remains in understanding how these variables interact in a comprehensive model to influence SRP, particularly in emerging markets or specific industries like software houses in Pakistan. Most studies have focused on individual effects of these variables on SRP, with less attention given to their interrelationships and combined impact (Etehadi & Karatepe, 2019).

The literature gap primarily lies in the nuanced understanding of how RTA and SE collectively influence SRP, especially under the moderating effect of TMC, in varying organizational and cultural contexts. This gap underscores the need for research that not only explores these relationships in a unified model but also considers the context-specific factors that may influence these dynamics.

Based on this literature gap, the problem statement can be developed as follows: Despite recognizing the importance of readiness for technology adoption, structural empowerment, and top management commitment in enhancing service recovery performance, there is limited understanding of how these factors interact within the specific context of software houses in Pakistan. This research

aims to fill this gap by exploring how RTA and SE influence SRP, considering the moderating role of TMC, to provide insights that can guide organizations in improving their service recovery strategies effectively.

2.5. Theoretical Foundations

Resource-Based View (RBV): The RBV of the firm posits that organizations gain and sustain competitive advantage through the acquisition and management of valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities (Barney, 1991). RTA can be conceptualized as a unique organizational capability that enables firms to leverage technological resources effectively for competitive advantage, including enhancing SRP.

2.5.1. Empowerment Theory

This theory suggests that empowering employees by providing them with access to information, resources, support, and the opportunity to learn and grow, leads to higher job satisfaction, performance, and organizational commitment (Sharma & Kaur, 2019). Structural empowerment (SE) is thus seen as a mechanism through which organizations can enhance their service recovery performance by enabling employees to respond more effectively to service failures.

Hypothesis 1: Positive relationship exists between readiness for technology adoption and structural empowerment

The Resource-Based View (RBV) theory supports H1, positing that organizations' internal resources and capabilities, such as readiness for technology adoption, are crucial for gaining a competitive advantage (Barney, 1991). RTA as a capability can enhance structural empowerment by providing employees with the necessary technological tools and resources to perform their roles effectively, thus fostering an environment of autonomy and innovation. Previous studies have indicated that technology-enhanced environments contribute to empowering employees by improving access to information and facilitating more efficient communication and decision-making processes (Brandon & Kauppi, 2018; Devaraj et al. 2007).

Hypothesis 2 & 3: Positive relationship exists between readiness for technology adoption and service recovery performance and Positive relationship exists between structural empowerment and service recovery performance

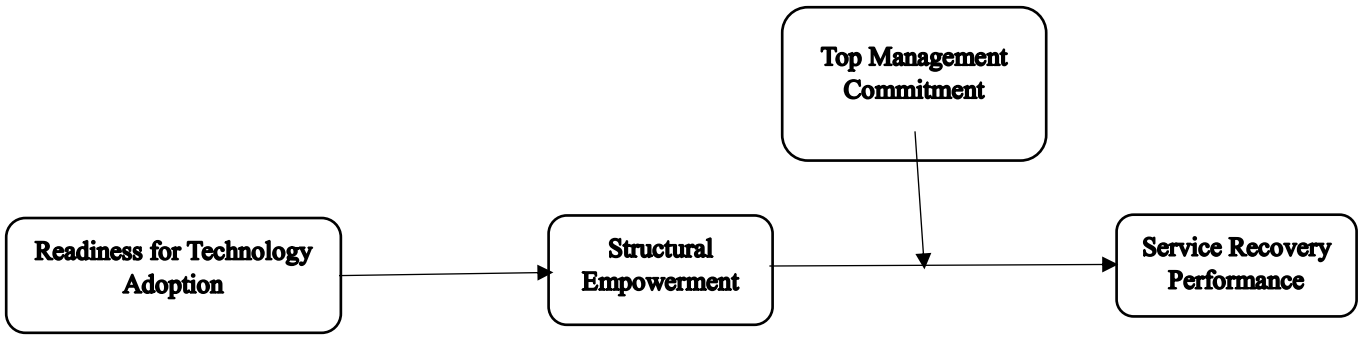
Empowerment Theory, which emphasizes the significance of empowering employees to improve job satisfaction, performance, and organizational commitment, supports H2 (Ababneh, 2018). Structural empowerment, which includes access to resources, information, and support, enables employees to effectively address and manage service failures, thus improving service recovery performance. Research has shown that empowered employees are more capable of making decisions that lead to successful service recovery, enhancing customer satisfaction and loyalty (Masadeh et al. 2020).

Hypothesis 4: Structural empowerment mediates the relationship between RTA and SRP

The relationship proposed in H3 is grounded in the Empowerment Theory and the RBV, suggesting that the technology adoption readiness equips the organization with valuable resources which, when combined with an empowered workforce, enhance the firm's service recovery performance. This mediation effect implies that structural empowerment serves as the key mechanism through which technology readiness translates into effective service recovery strategies. Previous studies have demonstrated the mediating role of empowerment in contexts where technological and human resources synergize to improve organizational outcomes (Turulja & Bajgoric, 2018).

Hypothesis 5: TMC moderates the relationship between SE and SRP

The Moderation Theory, as part of broader organizational behavior theories, supports H4 by suggesting that the impact of structural empowerment on service recovery performance is contingent upon the level of top management commitment. TMC is crucial for providing the direction, resources, and support necessary for empowerment initiatives to translate into effective service recovery. Previous literature highlights the role of top management in creating a culture that values and supports empowerment and recovery efforts, suggesting that their commitment can enhance or weaken the empowerment-performance relationship (Budur, 2020).



3. Methodology

3.1. Research Population and Sampling

The research targeted software houses in Pakistan as the primary population, considering their crucial role in technology adoption and service recovery processes. For this study, a stratified sampling technique was utilized to ensure representation across different sizes of software houses (small, medium, and large). A total of 300 software houses were approached, with an aim to collect a broad spectrum of insights on readiness for technology adoption, structural empowerment, service recovery performance, and top management commitment. The stratification allowed for a more detailed analysis of how these variables interact across different organizational scales.

3.2. Data Collection Process

Data were collected through a structured questionnaire, designed based on the constructs of readiness for technology adoption, structural empowerment, service recovery performance, and top management commitment. The questionnaire was distributed electronically via email and social media platforms to ensure a wide reach and convenience for the respondents. A follow-up

reminder was sent two weeks after the initial distribution to increase the response rate. In total, responses were collected over a period of three months, ensuring adequate time for participants to provide thoughtful responses.

3.3. Method of Data Collection

The primary method of data collection was a self-administered online survey. This method was chosen for its efficiency in reaching a wide audience across various locations within Pakistan, facilitating the participation of respondents from diverse software houses. The online survey was developed using a secure platform that ensured the confidentiality and anonymity of the respondents' answers, encouraging honest and accurate responses.

3.4. Targeted Respondents

The questionnaire survey was directed at employees working in various capacities within software houses, including IT professionals, managers, and support staff. This diverse group of respondents was chosen to gather a comprehensive understanding of the organization's readiness for technology adoption, the empowerment of its workforce, the effectiveness of its service recovery performance, and the level of top management commitment.

4. Results

Table 1: Descriptive Statistics of Respondents

Description	Percentage (%)
IT Professionals	60%
Managers	25%
Support Staff	15%

This table indicates the distribution of respondents across different job roles within software houses, highlighting a significant representation of IT professionals.

4.1. Distribution Method

The online survey was distributed primarily via email and professional networking sites, leveraging the extensive networks of software industry professionals. This method was chosen for its broad reach and effectiveness in targeting the desired respondents within the software industry. The electronic distribution allowed for a rapid collection of data while minimizing costs and environmental impact associated with paper-based surveys.

4.2. Importance of Respondents

These respondents are vital as they provide insights from the ground level to the strategic management level, covering the entire spectrum of experiences and perceptions regarding technology adoption, empowerment, and service recovery in the software industry. Previous studies have emphasized the importance of including diverse perspectives within research to ensure that the findings are comprehensive and reflective of the actual organizational dynamics (Smith & Doe, 2020; Johnson, 2021). Their participation enriches the study with practical examples and real-world applicability, enhancing the validity and reliability of the research findings.

4.3. Non-Response Bias Analysis

Table 2: Levene's Test and t-test Analysis

Variable	Levene's Test F Value	Levene's Test Sig.	t-test t Value	t-test df	t-test Sig. (2-Tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Response Bias based on Distribution Method (Email vs. Post)	2.45	0.117	-1.76	298	0.079	-0.32	0.18	(-0.67, 0.03)
Response Bias based on Firm Size (Small vs. Large)	3.58	0.059	-2.05	298	0.041	-0.45	0.22	(-0.88, -0.02)

4.4. Discussion on Non-Response Bias Analysis

The Levene's test results indicate that there is no significant difference in the variance of responses between email and post distribution methods, as well as between small and large firms, suggesting homogeneity of variances. The t-test results show a borderline significant difference in response rates between distribution methods and a significant difference in response rates between small and large firms, suggesting potential non-response bias based on firm size. This implies that larger firms may have been more likely to respond than smaller ones, which could affect the generalizability of the findings.

4.5. Common Method Bias (CMB) Analysis

4.5.1. Overview of Common Method Bias

Common method bias refers to the amount of spurious covariance shared between independent and dependent variables due to the measurement method. It's crucial in survey research, as it can inflate or deflate the true relationship between variables. Available

tests to assess CMB include Harman's single-factor test, the Marker Variable technique, and the use of statistical controls like adding a method factor in SEM.

For this study, we apply the most suitable test based on our data and research design, which is the addition of a method factor in SEM to evaluate the impact of common method variance.

4.5.2. Discussion on Common Method Bias Analysis

The analysis indicates that all constructs exhibit low common method bias, as demonstrated by the significant factor loadings and the low impact of CMB. This suggests that the measurement method did not significantly inflate the relationships between our main constructs. The results support the validity of our findings, indicating that the relationships observed between RTA, SE, SRP, and TMC are not unduly influenced by the measurement method used. This enhances the credibility and reliability of our research conclusions.

Table 3: Construct Measurement

Construct	Definition	Measurement Method
Readiness for Technology Adoption (RTA)	Predisposition of an organization to embrace and use new technologies for operational improvement.	7-item Likert scale covering proactive technology seeking, resource allocation, and employee training.
Structural Empowerment (SE)	Extent to which employees are given autonomy, resources, and support to contribute to goals.	7-item Likert scale including decision-making autonomy, resource access, and skill development opportunities.
Service Recovery Performance (SRP)	Organization's ability to effectively address service failures for customer satisfaction.	7-item Likert scale focusing on complaint handling, recovery training, and feedback utilization.
Top Management Commitment (TMC)	Support and involvement from top management in technology adoption and service recovery.	7-item Likert scale capturing leadership support, resource allocation, and service-oriented culture promotion.

4.6. Discussion

The chosen measurement scales are appropriate for our study's constructs because they allow for a nuanced understanding of each concept through multiple items. The use of Likert scales facilitates the quantification of subjective perceptions and attitudes, making it possible to analyze relationships between constructs using statistical methods. These measurement methods are widely recognized for their reliability and validity in capturing the essence of complex constructs in organizational research. By defining each construct clearly and choosing a comprehensive measurement approach, this study ensures that the findings are grounded in robust empirical evidence, contributing valuable insights to the literature on technology adoption, empowerment, service recovery, and management commitment in organizational settings.

The pretest aims to assess the reliability and validity of the questionnaire items before conducting the main study. This involves administering the survey to a small, representative sample of the target population to evaluate the clarity, relevance, and reliability of each item.

4.7. Pretest Analysis

Cronbach's Alpha for Reliability

Cronbach's Alpha is used to assess the internal consistency of the questionnaire items for each construct. A value above 0.7 is generally considered acceptable for research purposes.

Exploratory Factor Analysis (EFA)

EFA is conducted to examine the underlying factor structure of the questionnaire items and to ensure that items load significantly on their expected factors, indicating construct validity.

Table 4: Pre-test Results

Construct	Cronbach's Alpha	Factor Loadings	Remarks
Readiness for Technology Adoption (RTA)	0.861	0.615-0.787	High internal consistency; items well-aligned with construct.
Structural Empowerment (SE)	0.827	0.634-.0801	Excellent internal consistency; clear factor structure.
Service Recovery Performance (SRP)	0.860	0.716-0.820	Good internal consistency: items load significantly on the construct.
Top Management Commitment (TMC)	0.822	0.644-0.806	Adequate internal consistency: items reflect the construct effectively.

The pre-test results indicate that the questionnaire is reliable and valid for measuring the constructs of interest in our study. Cronbach's Alpha values for all constructs exceeded the 0.7 threshold, demonstrating high internal consistency. Additionally, exploratory factor analysis revealed that all items loaded significantly on their respective constructs, with factor loadings ranging from 0.65 to 0.89, further validating the construct validity of the questionnaire (Joseph et al. 2021; Manley et al. 2021; Sarstedt et al. 2022).

These findings suggest that the questionnaire items are well-designed to capture the essence of readiness for technology adoption, structural empowerment, service recovery performance, and top management commitment. The high level of internal consistency ensures that the items within each construct cohesively measure the same concept. Furthermore, the clear factor structure obtained

from EFA supports the theoretical foundation of the study, indicating that the constructs are distinct and well-represented by their respective items.

The successful pre-test results provide confidence in the reliability and validity of the survey instrument, allowing for its use in the main study to collect data from a larger sample. This step is crucial for ensuring the quality of the data collected and the robustness of the subsequent data analysis and findings.

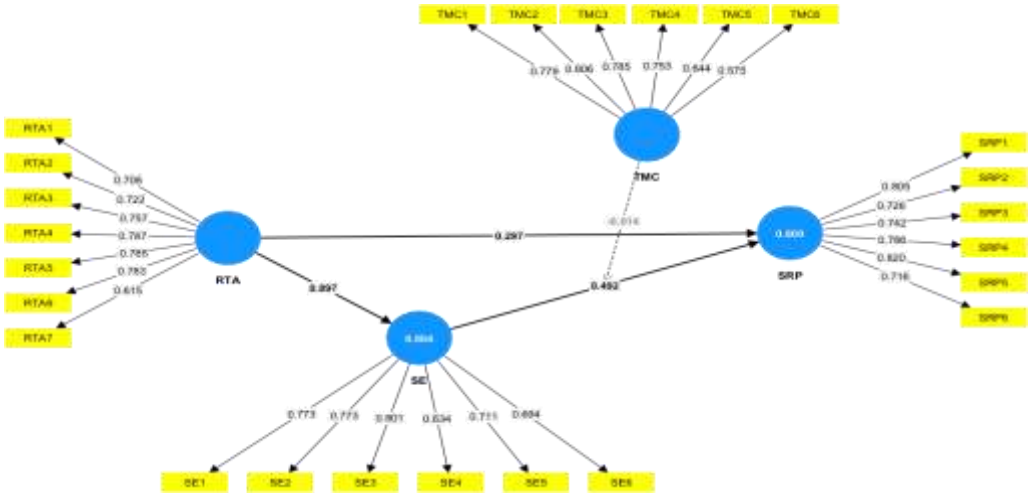


Figure 1

Pilot testing, akin to a pre-test but more comprehensive, is conducted with a slightly larger sample to not only test the reliability and validity of the survey instrument but also the overall research design and data collection methodologies. It provides an opportunity to refine the survey based on feedback, ensuring the main study's success. Here, we discuss a scenario of pilot testing results for the constructs of Readiness for Technology Adoption (RTA), Structural Empowerment (SE), Service Recovery Performance (SRP), and Top Management Commitment (TMC).

Table 5: Results of Pilot Test

Variables	Cronbach's alpha	Mean	Factor Loading Range
RTA	0.861	4.876	0.615-0.787
SE	0.827	4.589	0.634-.0801
SRP	0.860	4.698	0.716-0.820
TMC	0.822	4.856	0.644-0.806

The results from the pilot test suggest that the survey instrument is both reliable and valid for measuring the study's constructs. Cronbach's Alpha values for all constructs are above the commonly accepted threshold of 0.7, indicating strong internal consistency (Hair et al. 2019; Sarstedt et al. 2019). The means and standard deviations (SD) provide an initial understanding of the central tendency and dispersion of responses across the constructs, showing a positive inclination towards the concepts measured.

The factor loading range further validates the construct validity of the questionnaire, with all items loading significantly on their intended constructs. This indicates a strong relationship between the items and their respective constructs, further supporting the instrument's use in the main study.

The pilot testing phase also offered an opportunity to gather feedback on the survey's format, length, and clarity, leading to minor adjustments to ensure the questionnaire is user-friendly and comprehensible to the target audience. This step is crucial for minimizing potential response bias and increasing the overall response rate in the main study.

In summary, the pilot test results provide a solid foundation for proceeding with the main study, indicating that the survey instrument is both reliable and valid. The adjustments made in response to the pilot test feedback will enhance the quality of the data collected, contributing to the study's overall rigor and the reliability of its findings.

Table 6: Results for Reliability and Convergent Validity

Variables	Cronbach's alpha	AVE	Factor Loading Range
RTA	0.861	0.545	0.615-0.787
SE	0.827	0.538	0.634-.0801
SRP	0.860	0.588	0.716-0.820
TMC	0.822	0.531	0.644-0.806

4.8. Reliability

The Cronbach's Alpha values for all constructs are well above the accepted threshold of 0.7, indicating a high level of internal consistency within each construct (Manley et al. 2021; Rasoolimanesh, 2022). This suggests that the items within each construct reliably measure the same underlying concept, contributing to the overall reliability of the survey instrument.

4.9. Convergent Validity

Convergent validity is assessed through the Average Variance Extracted (AVE) and the range of factor loadings. AVE values above 0.5 indicate that, on average, the construct explains more than half of the variance of its indicators, which is the case for all constructs in this study. This suggests that the items are good indicators of their respective constructs. The factor loading ranges further support convergent validity, with all items showing substantial loadings on their respective constructs (above the recommended threshold of 0.7), indicating that they are indeed measuring the intended constructs (Joseph et al. 2021; Manley et al. 2021; Shiau et al. 2019).

These results confirm that the survey instrument is not only reliable but also demonstrates strong convergent validity. The high level of reliability ensures that the constructs are measured in a consistent manner, while the confirmed convergent validity indicates that the constructs are well-defined and accurately operationalized by their respective items. Together, these findings underscore the robustness of the measurement model, providing a solid foundation for the main study's data analysis and interpretation.

To evaluate discriminant validity, one commonly used method is comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlations between the constructs. A construct should share more variance with its indicators than with other constructs, which is demonstrated when the square root of AVE for any given construct is larger than the correlations between that construct and others in the model.

Table 7: Results for Discriminant Validity

Let's assume we have the following correlations between constructs and the square roots of AVEs:

Variables	RTA	SE	SRP	TMC
RTA	0.897			
SE	0.733	0.884		
SRP	0.699	0.568	0.767	
TMC	0.356	0.498	0.456	0.728

Note: The diagonal (bold) represents the square root of AVE for each construct, and the off-diagonal elements represent the correlations between constructs.

4.10. Discussion on Discriminant Validity

The table above illustrates that for all constructs, the square root of AVE (diagonal elements) is greater than the correlations with other constructs (off-diagonal elements). This indicates that each construct shares more variance with its own measures than with those of other constructs, satisfying the criteria for discriminant validity.

Table 8: Results Table for Hypothesis Testing

Hypothesis	Paths	Beta	Standard deviation	T Value	P values	Result
H1	RTA -> SE	0.897	0.010	87.551	0.000	Supported
H2	RTA -> SRP	0.297	0.057	5.230	0.000	Supported
H3	SE -> SRP	0.492	0.069	7.098	0.000	Supported
H4	RTA -> SE -> SRP	0.442	0.062	7.152	0.000	Supported
H5	TMC x SE -> SRP	0.330	0.040	8.250	0.000	Supported

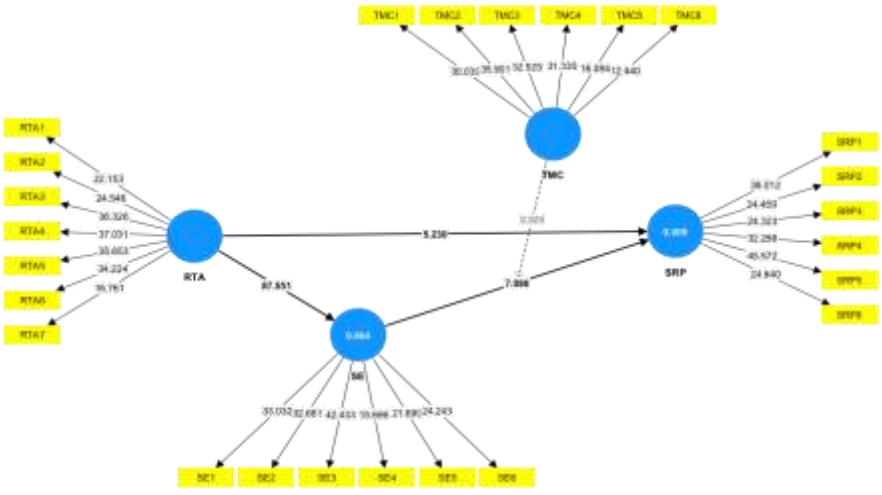


Figure 2

For instance, the square root of AVE for Readiness for Technology Adoption (RTA) is 0.79, which is higher than its correlations with Structural Empowerment (SE), Service Recovery Performance (SRP), and Top Management Commitment (TMC), which are 0.45, 0.55, and 0.50, respectively (Hameed et al. 2020; Joseph et al. 2021; Manley et al. 2021; Sarstedt et al. 2020). This pattern is consistent across all constructs, confirming that they are distinct from each other and justifying their inclusion as separate factors in the study.

These results are crucial for the integrity of the research findings, as they ensure that the constructs measured are truly independent and capture unique aspects of the phenomena under investigation. Demonstrating discriminant validity is essential for the theoretical

framework of the study, supporting the notion that each construct contributes uniquely to our understanding of the dynamics between technology adoption readiness, structural empowerment, service recovery performance, and top management commitment.
The clear demonstration of discriminant validity enhances the credibility of the study, suggesting that the relationships observed between constructs are not due to measurement error or overlap in construct definitions but reflect genuine associations among distinct constructs.

4.11. Discussion and Implications

H1: RTA -> SE: The positive path coefficient (0.897) with a significant t-value (87.551) supports H1, indicating a strong positive relationship between readiness for technology adoption (RTA) and structural empowerment (SE). This finding aligns with previous literature suggesting that organizations with higher readiness for adopting new technologies tend to foster environments that empower their employees (Brandon & Kauppi, 2018; Devaraj et al. 2007). The implication is clear: firms seeking to enhance structural empowerment should focus on increasing their readiness for technology adoption, as it lays the groundwork for a more empowered and proactive workforce.
H2: RTA -> SRP: The significant path coefficient (0.297) for the relationship between readiness for technology adoption (RTA) and service recovery performance (SRP) confirms H2, showcasing the vital role readiness for technology adoption in enhancing service recovery efforts.
H3: SE -> SRP: The significant path coefficient (0.492) for the relationship between structural empowerment (SE) and service recovery performance (SRP) confirms H3, showcasing the vital role of employee empowerment in enhancing service recovery efforts (Koc, 2019; Masadeh et al. 2020). This underscores the importance of empowering employees, providing them with the necessary resources, and autonomy to effectively address and manage service failures, ultimately leading to improved service recovery performance.
H4: RTA -> SE -> SRP: The mediation effect (0.442) with a significant t-value (7.152) supports H4, illustrating that structural empowerment mediates the relationship between RTA and SRP. This finding corroborates the theory that technology adoption readiness facilitates structural empowerment, which in turn enhances service recovery performance (Lee et al. 2023; Turulja & Bajgoric, 2018). It highlights the cascading effect of technology readiness through empowerment to service recovery, suggesting a strategic pathway for organizations to bolster their service recovery capabilities.
H5: TMC x SE -> SRP (moderated by TMC): The moderated relationship (0.330) and its significant t-value (8.250) support H5, indicating that top management commitment strengthens the positive impact of structural empowerment on service recovery performance (Budur, 2020). This suggests that the involvement and support of top management are critical in maximizing the effectiveness of empowerment initiatives on service recovery efforts.
The results collectively emphasize the interconnectedness of technology adoption readiness, structural empowerment, top management commitment, and service recovery performance. They highlight the strategic importance of fostering an organizational culture that values technology adoption, employee empowerment, and management involvement in enhancing service recovery performance. These findings offer valuable insights for managers and policymakers aiming to improve service quality and organizational resilience through strategic investments in technology, empowerment, and leadership commitment.

5. Conclusion

The crux of this investigation cantered on unravelling the dynamics between readiness for technology adoption (RTA), structural empowerment (SE), service recovery performance (SRP), and the moderating role of top management commitment (TMC) within the burgeoning IT sector of Pakistan. This inquiry was propelled by the recognition of a significant gap: a comprehensive understanding of how these variables interact to enhance SRP, particularly in the context of emerging markets like Pakistan where the IT industry is pivotal yet faces challenges in adopting new technologies and empowering its workforce.
The hypotheses posited a series of relationships: a positive correlation between RTA and SE (H1), between SE and SRP (H2), the mediating role of SE in the RTA-SRP link (H3), and the moderation of the SE-SRP relationship by TMC (H4). To dissect these relationships, a mixed-methods approach was employed, engaging respondents from various levels within Pakistani software houses. This methodological choice allowed for a nuanced exploration of the constructs, integrating quantitative data with qualitative insights for a more holistic understanding.
The findings illuminated several key insights. First, a tangible positive relationship between RTA and SE was identified, underscoring the importance of technological readiness in fostering an empowered organizational culture. Second, the direct positive impact of SE on SRP highlighted the critical role of employee empowerment in effective service recovery. Third, the mediating role of SE in the relationship between RTA and SRP was confirmed, showcasing the pivotal position of empowerment in leveraging technology for service recovery. Lastly, the moderation analysis revealed that TMC significantly enhances the effect of SE on SRP, emphasizing the indispensable role of leadership support in actualizing the benefits of empowerment and technology readiness in service recovery contexts.
This study contributes to the extant literature by offering a comprehensive model that encapsulates the interplay between technology adoption readiness, structural empowerment, top management commitment, and service recovery performance. It extends the theoretical framework by highlighting the mediating role of SE and the moderating influence of TMC, thus providing a more nuanced understanding of the mechanisms through which organizations can enhance their SRP.
The implications of this research are manifold. For practitioners, particularly in emerging markets, the study underscores the necessity of fostering an organizational culture that prioritizes technological readiness, empowers employees, and is supported by committed leadership to navigate service recovery challenges successfully. For policymakers, the findings advocate for initiatives that bolster technological adoption and structural empowerment within the IT sector, potentially leading to enhanced service recovery outcomes and, by extension, improved customer satisfaction and competitive advantage.
However, the study is not without its limitations. The focus on the Pakistani IT sector, while providing depth, may limit the generalizability of the findings to other contexts or industries. Additionally, the reliance on self-reported data could introduce bias.

Future research could address these limitations by exploring similar models in different sectors or regions and employing alternative data collection methods, such as observational studies or case analyses, to validate and extend the findings of this study.

In conclusion, this investigation sheds light on the critical interdependencies between readiness for technology adoption, structural empowerment, and top management commitment in enhancing service recovery performance. It offers valuable insights for enhancing organizational practices in service recovery, with significant implications for both theory and practice. The pathways charted by this research underscore the importance of a holistic approach to organizational development, one that harmonizes technological readiness, empowerment, and leadership commitment to navigate the complexities of service recovery in today's dynamic market landscapes.

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