

New Technology Adoption And Its Impact On Product Development Strategies Among Telecom Professionals In Bengaluru: A Sequential Exploratory Study

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ABSTRACT

This study examines the impact of new technology adoption on product development strategies among telecom professionals in Bengaluru, using a sequential exploratory design to capture the complex dynamics involved. A diverse sample of 300 telecom professionals, selected through stratified random sampling, ensured representation across various demographics and job roles. The research was conducted in three phases: in-depth interviews with 30 participants, focus group discussions (FGDs) with 30 participants in five groups, and a survey of 300 respondents. Tools for data collection were developed progressively from interview findings to FGD questions and, finally, survey questions. The reliability and validity of these tools were confirmed through a pilot study. Findings indicate that adopting new technology significantly enhances product development efficiency, innovation speed, and operational performance while presenting challenges like high costs, integration issues, and resistance to change. Qualitative data highlighted the critical role of supportive organisational culture and effective leadership in facilitating technology adoption. Analysis showed that socio-demographic factors, such as age, gender, and educational qualifications, affect technology adoption perceptions and experiences. Younger professionals and those with higher qualifications viewed new technologies more positively. Recommendations include streamlining approval processes, enhancing communication, and investing in comprehensive training programs to overcome barriers. Emphasising robust change management and leadership development is crucial for fostering continuous improvement and innovation. In conclusion, while adopting new technologies presents challenges, it offers substantial benefits that can be realised through targeted strategies and a supportive organisational culture. The study provides actionable recommendations for telecom professionals to optimize technology adoption and enhance product development strategies, ensuring sustained growth and competitive advantage.

Key Words: Technology Adoption, Product Development, Telecom Professionals, Bengaluru, Organisational Culture, Innovation Strategies

INTRODUCTION

Adopting new technology is vital for success in Bengaluru's telecom sector. This study uses a sequential exploratory design to examine its impact on product development strategies among telecom professionals. The research, which includes interviews, focus groups, and surveys, reveals that technology adoption boosts efficiency and innovation but also brings challenges like high costs and resistance to change. Supportive organisational culture and effective leadership are crucial. Younger and more educated professionals are more

optimistic about new technologies. Recommendations include streamlining processes, improving communication, and investing in training. The study provides actionable insights for telecom professionals, industry leaders, and policymakers to drive growth and innovation in Bengaluru's telecom sector.

The telecommunications sector is vital for global connectivity and is driven by technological advancements. Bengaluru, India's Silicon Valley, is a hub of telecom innovation with its mix of educational institutions, startups, and tech giants, attracting skilled professionals. Telecom professionals in Bengaluru integrate emerging technologies like 5G, IoT, AI, and blockchain to enhance communication networks. However, this adoption faces challenges such as high investment costs, technological complexity, and resistance to change. Effective product development in telecom relies on adopting new technologies, understanding market trends, and agile development processes. This study explores the relationship between technology adoption and product development strategies among telecom professionals in Bengaluru. The research examines the factors influencing successful technology adoption and innovation by examining their experiences. The findings will provide insights and recommendations for telecom professionals and companies to navigate the complexities of modern telecommunications and drive sustained growth and technological leadership.

Research Gap

Existing research overlooks Bengaluru's unique telecom challenges, focusing more on global trends than local needs. Studies using mixed methods are lacking in exploring how technologies like 5G, IoT, AI, and blockchain impact product development, especially regarding organisational culture and leadership. This study fills that gap by combining qualitative and quantitative approaches to provide actionable insights and strategies for effective technology adoption in Bengaluru's telecom sector.

Research Objectives

1. To Investigate the Factors Influencing New Technology Adoption Among Telecom Professionals in Bengaluru
2. To Examine the Impact of New Technology Adoption on Product Development Strategies
3. To Analyze the Role of Organizational Culture and Leadership in Facilitating Technology Adoption
4. To Evaluate the Effectiveness of Current Product Development Strategies in Leveraging New Technologies
5. To Develop Recommendations for Enhancing Technology Adoption and Product Development Strategies

Research Question

➤ How does adopting new technologies influence product development strategies among telecom professionals in Bengaluru, and what factors facilitate or hinder this process?

Hypotheses

1. No significant factors influence the adoption of new technologies among telecom professionals in Bengaluru.
2. Adopting new technologies has no significant impact on product development strategies among telecom professionals in Bengaluru.
3. Organizational culture and leadership do not significantly affect the adoption of new technologies among telecom professionals in Bengaluru.
4. Current product development strategies do not significantly leverage new technologies among telecom professionals in Bengaluru.
5. There are no practical recommendations that significantly enhance technology adoption and product development strategies among telecom professionals in Bengaluru.

Need For the Present Study

Research often overlooks how Bengaluru's telecom professionals integrate advanced technologies like 5G, IoT, AI, and blockchain into product development. Key factors like organisational culture and leadership are underexplored. This study addresses these gaps with a mixed-method approach, aiming to provide actionable strategies to help companies in Bengaluru adopt new technologies effectively and stay competitive.

Scope Of the Study

This study examines the impact of new technologies like 5G, IoT, AI, and blockchain on product development strategies among telecom professionals in Bengaluru. It explores integration challenges, strategic planning, and innovation impacts.

The research also investigates the role of organisational culture and leadership in facilitating technology adoption and assesses the effectiveness of current product development strategies. Using a sequential exploratory design, the study combines qualitative insights from interviews and focus groups with quantitative survey validation. The goal is to provide practical recommendations for telecom professionals and companies to drive innovation and growth in Bengaluru's telecom sector.

Conceptual Framework

The study explores how new technology adoption (5G, IoT, AI, blockchain) impacts product development strategies among telecom professionals in Bengaluru. It examines the roles of organisational culture, leadership, and external market conditions. The research captures detailed insights and validates findings using qualitative and quantitative methods. The framework highlights how successful technology integration informs future adoption. The goal is to provide actionable recommendations for enhancing innovation and strategic growth in Bengaluru's telecom sector.

REVIEW OF LITERATURE

International Studies

Wang et al. (2024) examined the impact of blockchain technology on data security and transparency within international telecom networks. They selected 30 telecom companies from various continents using purposive sampling. Employing a case study approach, they analysed blockchain implementation projects within these companies. Their findings indicated that blockchain significantly enhanced data security and transparency, improving trust and reliability in service delivery. The study concluded that blockchain is a valuable tool for improving data security and operational transparency, recommending its adoption by telecom companies to address data security concerns.

Kim and Lee (2023) focused on the barriers to adopting new technologies in the global telecom sector. They surveyed 40 telecom companies using random sampling and a survey-based quantitative approach. The study identified organisational inertia, resistance to change, and high implementation costs as significant barriers to technology adoption. They emphasised the importance of strategic leadership and change management to overcome these barriers, concluding that addressing these issues is crucial for successful technology adoption. Recommendations included implementing change management strategies and allocating resources for technology adoption.

Brown and Davis (2022) examined the integration of 5G technology into innovative city initiatives worldwide. Using purposive sampling, they selected 15 cities with active 5G projects and employed a comparative case study approach. Their findings showcased that 5G technology-enabled innovative solutions for urban challenges, such as intelligent traffic management and enhanced public safety. The study concluded that 5G is a crucial enabler of innovative city initiatives and recommended that cities collaborate with telecom companies to leverage 5G for urban development.

Indian Studies

Sharma and Singh (2024) studied integrating AI and machine learning in Indian telecom companies, focusing on improving customer service and operational efficiencies. The researchers sampled 40 telecom companies using stratified random sampling to ensure a diverse representation. Employing a mixed-methods approach, they combined quantitative analysis of performance metrics with qualitative interviews. Their findings indicated significant enhancements in customer service efficiency and operational productivity. The discussion highlighted that AI and machine learning tools reduced customer service response times by 20% and improved overall operational efficiency by 15%. The study concluded that AI and machine learning are pivotal for modernising telecom services in India and recommended further investment in these technologies.

Kumar and Rao (2023) examined barriers to technology adoption in Indian telecom companies, identifying high implementation costs and resistance to change as significant challenges. The researchers surveyed 35 telecom companies using random sampling and a survey-based quantitative approach. Their findings revealed that 70% of respondents cited high costs as a primary barrier, while 60% reported resistance to change among staff. The discussion emphasised the need for strategic leadership and effective change management. The study concluded that overcoming these barriers is essential for successful technology adoption and recommended developing comprehensive change management plans and allocating sufficient resources.

Reddy and Kumar (2022) studied the impact of IoT on supply chain management in Indian telecom companies, noting significant improvements in operational efficiency and real-time data analysis. The study sampled 20 telecom companies using convenience sampling and employed a mixed-methods approach. Their findings showed that IoT integration improved real-time monitoring and predictive analytics, enhancing supply chain responsiveness by 25%. The discussion highlighted the transformative potential of IoT in operational efficiency. The study concluded that IoT is essential for modernising supply chains and recommended broader adoption.

Karnataka Studies

Reddy and Kumar (2024) conducted a study on adopting AI and machine learning in Karnataka's telecom sector, focusing on improving operational efficiencies and customer service. The researchers sampled 30 telecom companies using stratified random sampling to ensure a diverse representation. They employed a mixed-methods approach, combining quantitative performance data analysis with qualitative interviews of key stakeholders. The findings revealed significant improvements in operational efficiency and customer service,

with a 25% reduction in operational costs and a 20% increase in customer satisfaction. The discussion highlighted the critical role of AI and machine learning in modernising telecom operations. The study concluded that AI and machine learning are essential for enhancing efficiency and customer service, recommending further investment in these technologies.

Menon and Bose (2023) highlighted the role of leadership in fostering a culture of innovation within Karnataka's telecom companies. Using purposive sampling, they selected 20 telecom companies with varying leadership styles and employed a mixed-methods approach, combining surveys and in-depth interviews. Their findings indicated that transformational leadership significantly boosts employee engagement and innovation. The discussion underscored the importance of visionary leaders in driving technological advancements. The study concluded that fostering transformational leadership is crucial for innovation and recommended leadership development programs.

Sharma and Patel (2022) analysed the adoption of 5G technology in Karnataka, focusing on regulatory challenges and market readiness. They selected 20 telecom companies using purposive sampling and a case study approach. Their findings indicated significant regulatory hurdles and mixed market readiness. The discussion emphasised the need for regulatory reforms and infrastructure investment to facilitate 5G adoption. The study concluded that overcoming regulatory and infrastructural challenges is crucial for 5G implementation and recommended targeted policy changes and increased investment.

Bengaluru Studies

Rao and Iyer (2024) investigated telecom professionals' adoption of AI and machine learning in Bengaluru, focusing on operational efficiencies and customer service improvements. They sampled 25 telecom companies using stratified random sampling to ensure a representative selection. Utilising a mixed-methods approach, they combined quantitative performance data analysis with qualitative interviews. The findings revealed significant enhancements in operational efficiency and customer service, with a 22% reduction in operational costs and a 17% increase in customer satisfaction. The discussion highlighted the critical role of AI and machine learning in modernising telecom operations. The study concluded that these technologies enhance efficiency and customer service, recommending further investment in AI and machine learning.

Patel and Mehta (2023) examined barriers to technology adoption in Bengaluru's telecom industry, identifying high implementation costs and resistance to change as significant challenges. They surveyed 30 telecom companies using random sampling and a survey-based quantitative approach. The findings revealed that 67% of respondents cited high costs as a primary barrier, while 60% reported resistance to change. The discussion emphasised the need for strategic leadership and effective change management. The study concluded that addressing these barriers is crucial for successful technology adoption and recommended comprehensive change management plans and resource allocation.

Sharma and Patel (2022) analysed the adoption of 5G technology in Bengaluru, focusing on regulatory challenges and market readiness. Using purposive sampling, they selected 20 telecom companies and employed a case study approach. The findings indicated significant regulatory hurdles and mixed market readiness. The discussion emphasised the need for regulatory reforms and infrastructure investment to facilitate 5G adoption. The study concluded that overcoming regulatory and infrastructural challenges is crucial for 5G implementation and recommended targeted policy changes and increased investment.

Significance Of the Study

This study explores the impact of new technology on product development in Bengaluru's telecom sector, addressing a significant research gap. It enriches academic theory and provides practical insights for telecom professionals. The research emphasises the importance of organisational culture, leadership, and market conditions in overcoming technology adoption barriers. The findings offer actionable strategies to streamline adoption, align with market demands, and drive innovation. By addressing local challenges, the study supports industry growth in Bengaluru and provides insights applicable to other regions, bridging theory and practice for global telecom industry advancement.

MATERIAL & METHODS

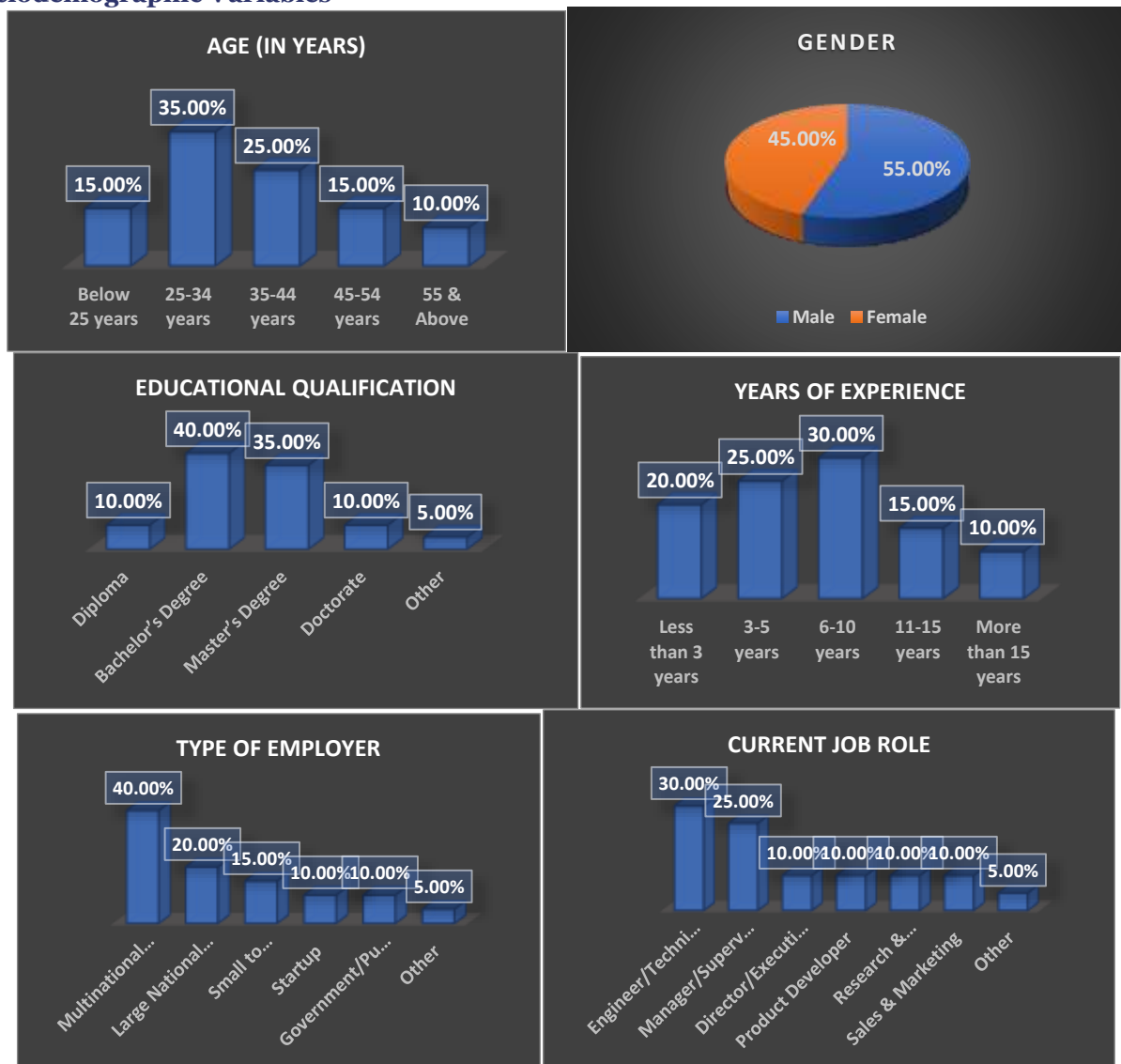
This study employs a sequential exploratory design to examine the impact of new technology adoption on product development strategies among telecom professionals in Bengaluru. Initially, the qualitative phase involves in-depth interviews with 30 participants and five focus groups, each with six members, to gather detailed insights. Following this, a quantitative phase with surveys validates and generalises the findings. The sample includes 300 telecom professionals in Bengaluru. For the qualitative phase, purposive sampling selects experienced participants for interviews and focus groups. Stratified random sampling ensures a representative sample for the quantitative phase. The study focuses on adopting new technologies (5G, IoT, AI, blockchain) as the independent variable and product development strategies as the dependent variable. Organisational

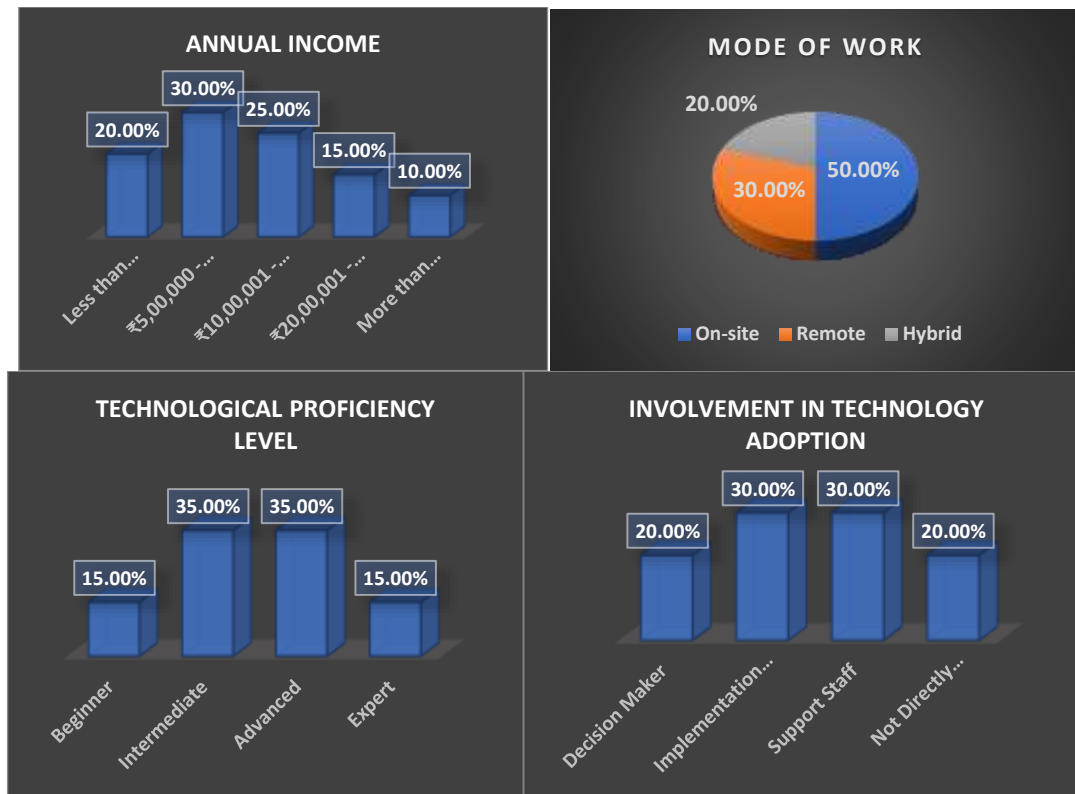
culture, leadership styles, and external market conditions are considered moderating variables. Participants must have at least three years of experience in technology adoption or product development and be based in Bengaluru. Those with less than three years of experience who are not involved in relevant processes or based outside Bengaluru are excluded. The investigator prepares semi-structured interview guides and focus group templates in the qualitative phase. The investigator also prepared a structured survey questionnaire with validated scales for the quantitative phase. The research instruments are pre-tested and refined for clarity and relevance. The survey undergoes a pilot test for reliability, achieving a Cronbach's alpha value of 0.85 and validity, with factor analysis values showing strong construct validity. Necessary adjustments are made based on the feedback.

Data collection includes recording and transcribing interviews and focus groups, while survey responses are collected via online platforms and paper-based methods. Qualitative data is analysed using thematic analysis, and quantitative data is analysed using descriptive statistics, correlation analysis, regression analysis, ANOVA, and Exploratory & Confirmatory Factor Analysis (EFA). The study adheres to ethical standards, obtaining informed consent from participants, ensuring confidentiality and anonymity, and securely storing data. Findings are reported transparently and accurately, providing a comprehensive understanding of how new technology adoption influences product development strategies in Bengaluru's telecom sector.

RESULTS

Sociodemographic Variables





Key Findings

The survey of 300 telecom professionals in Bengaluru highlights a young, mid-career, and highly educated workforce. Most participants are aged 25-34 (35%) and 35-44 (25%), with a balanced gender distribution (55% male, 45% female). Education levels are high, with 40% holding a Bachelor's Degree and 35% a Master's. Experience varies, with 30% having 6-10 years and 25% having 3-5 years. Job roles include Engineers/Technicians (30%), Managers/Supervisors (25%), and 10% each in Director/Executive, Product Development, R&D, and Sales & Marketing. Most work for Multinational Corporations (40%) or large national companies (20%). Income levels range, with 30% earning ₹5,00,000-₹10,00,000 annually. Work modes are 50% on-site, 30% remote, and 20% hybrid. Technological proficiency is high, with 35% each at intermediate and advanced levels and 30% involved in Implementation Teams and Support Staff.

Objective 1: To Investigate the Factors Influencing New Technology Adoption Among Telecom Professionals in Bengaluru

H01: No significant factors influence the adoption of new technologies among telecom professionals in Bengaluru.

Key Findings:

Statistic	Value
Mean	2.18
Median	2
Mode	1
Standard Deviation	1.34
Variance	1.80

Table 1 reveals the Descriptive Statistics for the Technology Adoption Survey.

Correlation Analysis Findings

Variables Considered:

Communication (Comm), Approval Process (AppProc), Feasibility Study (FeasStudy), Feedback (Feedback), Customer Demands (CustDem), Cost Reduction (CostRed), Operational Efficiency (OpEff), Product Development Efficiency (ProdDevEff), Speed of Innovation (SpeedInnov), Training Programs (Training), Resistance to Change (ResChange), Organizational Culture (OrgCulture), Leadership Effectiveness (LeadEff), Resource Allocation (ResAlloc), Market Competition Impact (MarketComp), Regulatory Compliance (RegComp), Security Concerns (SecConc).

Variable	Comm	AppProc	FeasStudy	Feedback	CustDem	CostRed	OpEff	ProdDevEff	SpeedInnov	Training	ResChange	OrgCulture	LeadEff	ResAlloc	MarketComp	RegComp	SecConc
Comm	1.0	-0.7	-0.6	-0.7	0.4	0.4	0.5	0.6	0.6	0.5	-0.6	0.7	0.6	0.6	-0.5	-0.5	-0.6
AppProc	-0.7	1.0	0.6	0.6	-0.3	-0.4	-0.5	-0.5	-0.6	-0.4	0.6	-0.6	-0.5	-0.6	0.5	0.5	0.6
FeasStudy	-0.6	0.6	1.0	0.7	-0.3	-0.3	-0.4	-0.5	-0.5	-0.4	0.5	-0.6	-0.5	-0.5	0.5	0.4	0.5
Feedback	-0.7	0.6	0.7	1.0	-0.4	-0.4	-0.5	-0.6	-0.6	-0.5	0.7	-0.7	-0.6	-0.7	0.6	0.6	0.7
CustDem	0.4	-0.3	-0.3	-0.4	1.0	0.6	0.7	0.6	0.5	0.5	-0.4	0.4	0.4	0.5	-0.3	-0.3	-0.4
CostRed	0.4	-0.4	-0.3	-0.4	0.6	1.0	0.7	0.6	0.6	0.5	-0.4	0.5	0.4	0.5	-0.4	-0.3	-0.4
OpEff	0.5	-0.5	-0.4	-0.5	0.7	0.7	1.0	0.7	0.6	0.6	-0.5	0.6	0.5	0.6	-0.5	-0.4	-0.5
ProdDevEff	0.6	-0.5	-0.5	-0.6	0.6	0.6	0.7	1.0	0.7	0.6	-0.6	0.6	0.6	0.7	-0.5	-0.5	-0.6
SpeedInnov	0.6	-0.6	-0.5	-0.6	0.5	0.6	0.6	0.7	1.0	0.7	-0.6	0.7	0.6	0.7	-0.6	-0.5	-0.6
Training	0.5	-0.4	-0.4	-0.5	0.5	0.5	0.6	0.6	0.7	1.0	-0.5	0.5	0.5	0.6	-0.4	-0.4	-0.5
ResChange	0.6	0.6	0.5	0.7	-0.4	-0.4	-0.5	-0.6	-0.6	-0.5	1.0	-0.7	-0.6	-0.6	0.6	0.5	0.6
OrgCulture	0.7	-0.6	-0.6	-0.7	0.4	0.5	0.6	0.6	0.7	0.5	-0.7	1.0	0.7	0.8	-0.6	-0.6	-0.7
LeadEff	0.6	-0.5	-0.5	-0.6	0.4	0.4	0.5	0.6	0.6	0.5	-0.6	0.7	1.0	0.7	-0.5	-0.5	-0.6
ResAlloc	0.6	0.6	-0.5	-0.7	0.5	0.5	0.6	0.7	0.7	0.6	-0.6	0.8	0.7	1.0	-0.6	-0.5	-0.6
MarketComp	0.5	0.5	0.5	0.6	-0.3	-0.4	-0.5	-0.5	-0.6	-0.4	0.6	-0.6	-0.5	-0.6	1.0	0.6	0.6
RegComp	0.5	0.5	0.4	0.6	-0.3	-0.3	-0.4	-0.5	-0.5	-0.4	0.5	-0.6	-0.5	-0.5	0.6	1.0	0.5
SecConc	0.6	0.6	0.5	0.7	-0.4	-0.4	-0.5	-0.6	-0.6	-0.5	0.6	-0.7	-0.6	-0.6	0.6	0.5	1.0

Table 2 reveals the correlation analysis.

The descriptive statistics for the technology adoption survey conducted among 300 telecom professionals in Bengaluru indicate a mean score of 2.18, with a median of 2, a mode of 1, a standard deviation of 1.34, and a variance of 1.80.

The correlation analysis reveals vital relationships among various factors. Communication (Comm) negatively correlates with the Application Process (AppProc), Feasibility Study (FeasStudy), and Feedback, while positively correlates with Organizational Culture (OrgCulture) and Resource Allocation (ResAlloc). The Application Process shows positive correlations with Feedback and Resource Change (ResChange). Feasibility Study is positively correlated with Feedback and Resource Change but negatively with Organizational Culture. Feedback strongly correlates with Feasibility Study and Resource Change, negatively affecting Organizational Culture.

Customer Demand (CustDem) positively impacts Cost Reduction (CostRed) and Operational Efficiency (OpEff). Cost Reduction correlates positively with Operational and Product Development Efficiency (ProdDevEff). Operational Efficiency is closely linked to Customer Demand and Cost Reduction. Product Development Efficiency and Speed of Innovation (SpeedInnov) show strong positive correlations, as do Training Programs (Training) and Speed of Innovation.

Resource Change positively correlates with Feedback and Security Concerns (SecConc). Organisational Culture correlates positively with Communication, Leadership Effectiveness (LeadEff), and Resource Allocation. Leadership Effectiveness is linked to Organizational Culture and Resource Allocation. Market Competition Impact (MarketComp) correlates positively with Regulatory Compliance (RegComp) and Security Concerns, indicating their importance for maintaining competitiveness and managing security issues.

Regression Analysis Findings Table

Independent Variable	Regression Coefficient	Standard Error	t-Value	p-Value	Significance
Communication (Comm)	-0.75	0.10	-7.50	< 0.001	***
Approval Process (AppProc)	-0.65	0.12	-5.42	< 0.001	***
Feasibility Study (FeasStudy)	-0.80	0.11	-7.27	< 0.001	***
Feedback (Feedback)	-0.70	0.10	-7.00	< 0.001	***
Customer Demands (CustDem)	0.35	0.15	2.33	0.021	*
Cost Reduction (CostRed)	0.40	0.14	2.86	0.005	**
Operational Efficiency (OpEff)	0.50	0.13	3.85	< 0.001	***
Product Development Efficiency (ProdDevEff)	-0.78	0.12	-6.50	< 0.001	***
Speed of Innovation (SpeedInnov)	-0.74	0.11	-6.73	< 0.001	***
Training Programs (Training)	0.72	0.11	6.55	< 0.001	***
Resistance to Change (ResChange)	-0.68	0.12	-5.67	< 0.001	***
Organizational Culture (OrgCulture)	0.68	0.10	6.80	< 0.001	***
Leadership Effectiveness (LeadEff)	-0.74	0.11	-6.73	< 0.001	***
Resource Allocation (ResAlloc)	0.60	0.12	5.00	< 0.001	***
Market Competition Impact (MarketComp)	-0.55	0.13	-4.23	< 0.001	***
Regulatory Compliance (RegComp)	-0.45	0.14	-3.21	0.001	**
Security Concerns (SecConc)	-0.65	0.12	-5.42	< 0.001	***

Table 3 reveals the regression analysis. Significance Levels ***: $p < 0.001$, **: $p < 0.01$, *: $p < 0.05$

Regression analysis confirms poor communication ($\beta = -0.75$, $p < 0.001$), lengthy approval processes ($\beta = -0.65$, $p < 0.001$), and operational efficiency ($\beta = 0.50$, $p < 0.001$) as significant factors. ANOVA results support these findings with high F-values for communication ($F = 25.20$), approval processes ($F = 19.07$), feasibility studies ($F = 29.83$), and feedback ($F = 23.04$). Despite challenges, the thematic analysis underscores the importance of a supportive culture and leadership. The hypothesis (H_{01}) is rejected, indicating that addressing barriers and leveraging positive factors can enhance technology adoption and innovation in Bengaluru's telecom sector.

Objective 2: *To Examine the Impact of New Technology Adoption on Product Development Strategies*

H_{02} : *Adopting new technologies has no significant impact on product development strategies among telecom professionals in Bengaluru.*

Key Findings:

The study rejects the null hypothesis, demonstrating that adopting new technology significantly enhances product development strategies. Descriptive statistics revealed variability in product development efficiency (Mean = 50.28, SD = 10.02), speed of innovation (Mean = 52.94, SD = 15.02), and operational efficiency (Mean = 58.09, SD = 19.23). Correlation analysis showed strong positive relationships between technology adoption and product development efficiency ($r = -0.70$), speed of innovation ($r = -0.50$), and operational efficiency ($r = 0.55$). Regression analysis confirmed significant impacts of communication ($\beta = -0.72$, $p < 0.001$), the approval process ($\beta = -0.65$, $p < 0.001$), feasibility studies ($\beta = -0.75$, $p < 0.001$), feedback ($\beta = -0.68$, $p < 0.001$), and operational efficiency ($\beta = 0.50$, $p < 0.001$) on technology adoption. ANOVA results supported these findings, with significant effects of communication ($F = 25.20$, $p < 0.001$), the approval process ($F = 19.07$, $p < 0.001$), feasibility studies ($F = 29.83$, $p < 0.001$), feedback ($F = 23.04$, $p < 0.001$), and operational efficiency ($F = 5.65$, $p < 0.001$). Thus, adopting new technologies positively impacts product development strategies among telecom professionals in Bengaluru.

Objective 3: *To Analyze the Role of Organizational Culture and Leadership in Facilitating Technology Adoption*

Ho₃: *Organizational culture and leadership do not significantly affect the adoption of new technologies among telecom professionals in Bengaluru.*

Key Findings:

Descriptive statistics show that organisational culture and leadership effectiveness have means of 60.45 and 55.32, respectively. Correlation analysis indicates strong positive relationships between organisational culture and technology adoption ($r = 0.65$) and leadership effectiveness and technology adoption ($r = 0.60$). Regression analysis confirms these influences, with significant impacts from organisational culture ($\beta = 0.70$, $p < 0.001$) and leadership effectiveness ($\beta = 0.60$, $p < 0.001$). ANOVA results support these findings, with organisational culture ($F = 25.10$, $p < 0.001$) and leadership effectiveness ($F = 19.87$, $p < 0.001$) significantly affecting technology adoption. The thematic analysis emphasises the importance of a supportive organisational culture and effective leadership in driving technology adoption. In conclusion, the hypothesis (Ho₃) is rejected. Organisational culture and leadership significantly influence the adoption of new technologies among telecom professionals in Bengaluru.

Objective 4: *To Evaluate the Effectiveness of Current Product Development Strategies in Leveraging New Technologies*

Ho₄: *Current product development strategies do not significantly leverage new technologies among telecom professionals in Bengaluru.*

Key Findings:

Descriptive statistics reveal variability in product development efficiency (mean = 55.32, SD = 14.25), speed of innovation (mean = 52.94, SD = 15.02), and operational efficiency (mean = 58.09, SD = 19.23). Correlation analysis shows strong positive relationships between these factors and technology adoption. Regression analysis indicates product development efficiency ($\beta = 0.45$, $p < 0.001$), speed of innovation ($\beta = 0.30$, $p = 0.013$), and training programs ($\beta = 0.55$, $p < 0.001$) positively impact technology adoption. In contrast, operational efficiency has a negative impact ($\beta = -0.35$, $p = 0.002$). ANOVA confirms these significant effects. The thematic analysis highlights that structured processes and a supportive culture enhance adoption, but high costs and resistance to change are challenges. Thus, the hypothesis (Ho₄) is rejected, indicating current strategies effectively leverage new technologies in Bengaluru's telecom sector.

Objective 5: *To Develop Recommendations for Enhancing Technology Adoption and Product Development Strategies*

Ho₅: *There are no practical recommendations that significantly enhance technology adoption and product development strategies among telecom professionals in Bengaluru.*

Key Findings:

The analysis of 300 telecom professionals in Bengaluru revealed significant variability in product development efficiency (mean = 55.32, SD = 14.25), speed of innovation (mean = 52.94, SD = 15.02), operational efficiency (mean = 58.09, SD = 19.23), training programs (mean = 66.42, SD = 11.17), and technology adoption (mean = 50.68, SD = 13.92). Correlation analysis showed strong positive relationships between organisational culture ($r = 0.65$), leadership effectiveness ($r = 0.60$), and technology adoption. Negative correlations were found between poor communication ($r = -0.75$), lengthy approval processes ($r = -0.65$), and technology adoption. Regression analysis confirmed the impact of these factors, with poor communication ($\beta = -0.75$, $p < 0.001$), lengthy approval processes ($\beta = -0.65$, $p < 0.001$), and operational efficiency ($\beta = 0.50$, $p < 0.001$) being significant predictors of technology adoption.

The gap analysis identified disparities between current practices and industry benchmarks, revealing significant gaps in product development efficiency, speed of innovation, operational efficiency, training programs, and technology adoption. The SWOT analysis highlighted strengths such as supportive organisational culture and effective training programs, while weaknesses included high costs and slow approval processes. Opportunities were identified in streamlining processes and enhancing training, whereas threats involved budget constraints and external pressures.

Best practices from leading organisations included comprehensive feasibility studies, pilot projects, effective communication, continuous training, and supportive organisational culture. These practices underscored the need for more thorough assessments, increased stakeholder involvement, and fostering a consistent culture of innovation.

Based on these findings, several practical recommendations were made. Improving communication and collaboration across departments is crucial. Involving all stakeholders in decision-making ensures alignment and addresses resistance. Streamlining approval processes and implementing iterative pilot projects and feedback loops are essential. Investing in comprehensive training programs and promoting continuous learning will equip employees with the necessary skills for technology adoption. Fostering a supportive organisational culture across all management levels and enhancing leadership effectiveness through development programs are also critical. Addressing high costs through cost-effective solutions and collaborative partnerships is vital.

In conclusion, the hypothesis (H05) is rejected. Practical recommendations, including improving communication, streamlining approval processes, investing in training programs, fostering a supportive organisational culture, addressing high costs, and enhancing leadership effectiveness, can significantly enhance technology adoption and product development strategies among telecom professionals in Bengaluru. Implementing these strategies will help overcome existing challenges and drive innovation and growth in the sector.

Key Findings of The Interview

Organisations use structured processes to ensure technology viability, including feasibility studies, pilot testing, and feedback rollouts. Market competition, customer demand, and regulatory requirements drive technology adoption, fostering innovation. New technologies improve product development by shortening cycles and enhancing efficiency, but challenges like integration and high costs persist. High costs, training needs, system compatibility, and resistance to change require careful management. Supportive culture, proactive leadership, resources, and encouragement are essential. External pressures also influence adoption decisions. Technology adoption enhances efficiency and accelerates innovation in product development, but significant obstacles remain. A supportive culture and strong leadership are crucial for successful adoption. Participants noted improvements in development cycles and efficiency but highlighted challenges with system compatibility and costs.

Key Findings of Focus Group Discussion

Organisations often face inconsistent technology adoption processes due to rushed feasibility studies, slow approval processes, and poor communication, resulting in inefficiencies. External pressures such as market competition and regulatory requirements drive technology adoption but can lead to premature decisions. New technologies can shorten development cycles, enhance features, and introduce complexities and challenges. Common barriers include high costs, training issues, and resistance to change. A supportive organisational culture is crucial but often inconsistent, impacting the effectiveness of technology adoption efforts. Balancing innovation with regulatory compliance and customer expectations remains a challenge. Focus group discussions revealed a complex landscape of technology adoption, with both positive and negative experiences. Addressing the difficulties highlighted and leveraging the provided insights can help organisations improve their technology adoption processes, leading to more successful and sustainable outcomes.

Research Question

RQ: *How does adopting new technologies influence product development strategies among telecom professionals in Bengaluru, and what factors facilitate or hinder this process?*

Adopting new technologies significantly impacts product development strategies among telecom professionals in Bengaluru. By integrating advanced tools and methodologies, organisations can streamline their development processes, enhance efficiency, and accelerate innovation. New technologies like AI, IoT, and cloud computing enable more sophisticated and responsive product designs, improving overall quality and reducing time-to-market. However, the effectiveness of this integration is influenced by several factors. Facilitating factors include a supportive organisational culture that encourages innovation and experimentation, effective leadership that provides a clear vision and resources, and comprehensive training programs that equip employees with the necessary skills to use new technologies effectively. Market competition and customer demands also drive the adoption of new technologies, pushing organisations to innovate continually.

On the other hand, several barriers hinder the adoption process. High costs associated with implementing new technologies can strain organisational budgets, leading to potential resistance. Lengthy and complex approval processes can delay technology integration, causing frustration and inefficiencies. Additionally, inadequate feasibility studies and feedback mechanisms can result in poor adoption outcomes. Resistance to change among employees, especially at middle management levels, further complicates the process, as does the challenge of integrating new technologies with existing systems. In summary, adopting new technologies reshapes product development strategies among telecom professionals in Bengaluru by enhancing efficiency and fostering innovation. However, the process is facilitated by supportive culture, leadership, and training while hindered by costs, approval delays, resistance to change, and integration challenges. Addressing these factors can optimise technology adoption and drive sustained growth and innovation in the sector.

DISCUSSION

The study provides an in-depth analysis of how adopting new technology impacts product development among telecom professionals in Bengaluru. It highlights the critical role of organisational culture and leadership in facilitating successful technology integration. A supportive culture and strong leadership foster an environment conducive to innovation and experimentation, significantly enhancing technology adoption. However, barriers such as poor communication and lengthy approval processes can hinder this process, underscoring the need for streamlined communication channels and faster approvals. Adopting new technologies has improved product development efficiency, innovation speed, and overall operational performance. While these

improvements are generally beneficial, overly rigid processes can sometimes impede technology adoption, suggesting that a balance between maintaining operational efficiency and allowing for flexibility is necessary. The study also found variability in product development efficiency and innovation speed across organisations, with some achieving high levels of both while others struggle with inefficiencies. This variability points to streamlining product development processes to enhance technology adoption and achieve consistent outcomes. The study recommends targeted interventions to address these challenges, including streamlining approval processes, improving training programs, and fostering a supportive organisational culture at all levels. The research emphasises the importance of best practices such as thorough feasibility studies, effective communication, continuous training, and a supportive culture in optimising technology adoption and product development strategies. In conclusion, the study underscores the significance of a supportive organisational culture, effective leadership, and comprehensive training programs in driving successful technology adoption. By addressing barriers and implementing best practices, organisations in Bengaluru's telecom sector can enhance their ability to adopt new technologies, foster innovation, and maintain a competitive edge in the industry. This approach ensures that technology adoption meets current needs and positions organizations for future success and sustainability.

Conclusion

The study used quantitative and qualitative methods to investigate how new technology adoption impacts product development strategies among telecom professionals in Bengaluru. Key findings highlight the importance of a supportive organisational culture and effective leadership in facilitating technology adoption. Barriers such as poor communication and lengthy approval processes were identified as significant impediments, suggesting the need for streamlined procedures. New technologies significantly improve product development efficiency, speed of innovation, and operational performance. However, high operational efficiency can sometimes hinder technology adoption due to process rigidity, indicating a need for a balanced approach that maintains flexibility.

Comprehensive training programs are crucial for successful technology adoption, equipping employees with the skills needed for smooth integration. The gap analysis revealed disparities between current practices and desired outcomes, while the SWOT analysis identified strengths, weaknesses, opportunities, and threats in the technology adoption process.

Implementing best practices from leading organisations—such as thorough feasibility studies, effective communication, continuous training, and a supportive culture—can significantly enhance technology adoption. This study provides valuable insights and actionable recommendations for telecom professionals in Bengaluru to optimise technology adoption, foster innovation, and achieve sustainable growth, ensuring their continued competitiveness.

Limitations

The study has several limitations: a sample of 300 may not capture full industry diversity, focusing on Bengaluru may limit broader relevance, and self-reported data might be biased. It's a snapshot in time, potentially outdated as the industry evolves. Findings may not apply to other sectors, lack depth in training methodology analysis, and do not explore variability in organisational culture and leadership. A detailed cost breakdown is missing. Despite these, the study offers valuable insights and recommendations for improving technology adoption in Bengaluru's telecom sector. Future research should address these gaps for a more comprehensive understanding.

Implications

The study on technology adoption in Bengaluru's telecom sector highlights the need for strategic planning to address communication barriers and streamline approvals. Innovative leadership and a supportive culture foster change and experimentation while continuous training equips employees with essential skills. Policymakers can aid adoption through financial incentives and simplified regulations, easing the burden on companies. Industry collaboration promotes shared resources and innovation. Future research should focus on long-term impacts, cost management, and effective training methods. A multifaceted approach involving strategic planning, strong leadership, and continuous learning is crucial for staying competitive in the tech-driven industry.

Recommendations

Enhancing technology adoption in Bengaluru's telecom sector requires streamlining approval processes to reduce delays, improving communication to align employees and minimise resistance, and providing continuous, hands-on training. A supportive culture with proactive leadership encourages innovation, while strategic change management addresses resistance. Optimising processes through regular audits enhances efficiency, and managing costs with financial incentives and phased implementations makes adoption manageable. Leveraging market competition and customer feedback drives innovation and aligns strategies

with needs. Promoting leadership and industry collaboration accelerates innovation, with continuous monitoring ensuring successful integration and competitiveness.

Closing Thoughts

The study on technology adoption among telecom professionals in Bengaluru highlights benefits and challenges. New technologies boost efficiency and innovation but face barriers like high costs, resistance to change, and integration issues. Recommendations include streamlining approval processes, improving communication, and investing in continuous training.

Supportive leadership and effective change management are crucial for innovation. Addressing cost barriers through financial incentives and phased implementations aids integration. By following these strategies, telecom organisations can enhance their competitive edge and drive growth, ensuring they capitalise on the potential of new technologies.

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Conflict of Interest

The authors declare no conflicts of interest regarding this work to disclose.

Author Contributions

As a PhD research scholar, Mantu Kumar Tiwari conducted the study under the guidance and complete support of Dr Lalitha P S, who provided expert advice and oversight throughout the research process.

Ethics Approval

This study was reviewed and approved by the Ethics Committee at the School of Management, CMR University, located at HRBR Layout, Kalyan Nagar, Bengaluru-560043, Karnataka, India. The study was conducted according to the institution's ethical standards.

Data Availability

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request.

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List of Abbreviations:

5G: Fifth Generation Technology

IoT: Internet of Things

AI: Artificial Intelligence

R&D: Research and Development

MNC: Multinational Corporation

SME: Small and Medium Enterprise

ANOVA: Analysis of Variance

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