International Research Journal of Education and Technology

Peer Reviewed Journal, **ISSN: 2581-7795**

IDENTIFICATION OF BARRIERS AND FACILITATORS IN THE ADOPTION OF DIGITAL TECHNOLOGY

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ABSTRACT

The use of digital technology is crucial for improving efficiency, fostering innovation, and optimizing service delivery across several industries. Nonetheless, the effective deployment of digital technology is inconsistent owing to several contributing variables. This review study seeks to identify and summarize the principal hurdles and facilitators influencing the adoption of digital technology. The report identifies significant obstacles, including substantial financial expenses, insufficient digital infrastructure, a deficiency in technical skills, opposition to organizational transformation, privacy and security issues, and inadequate policy support, based on an extensive literature assessment. Conversely, enablers of digital technology adoption are robust leadership commitment, user training and digital literacy, perceived utility and usability, technological preparedness, a supportive company culture, and facilitating government regulations and incentives. The research classifies these aspects into human, organizational, and environmental levels to offer a systematic comprehension of digital adoption dynamics. This study synthesizes data from previous studies, providing essential insights for policymakers, practitioners, and academics aiming to formulate effective solutions to address adoption issues.

Keywords:*Barriers; Adoption; Digital Technology*

I. INTRODUCTION

The use of digital technologies by SMEs is essential for survival, scalability, and competitiveness. Comprehending the shift of Indian SMEs towards digital maturity and the hurdles encountered is essential for both individual company success and the overall economic modernization of India. This research seeks to examine the use of digital technologies by SMEs in India, concentrating on the advantages, obstacles, and overall effect on operational efficiency and consumer engagement. The integration of digital technology by Small and Medium Enterprises (SMEs) has garnered considerable attention recently due to its capacity to improve operational efficiency and customer engagement. This literature review examines several research and viewpoints on how SMEs in India are utilizing digital technology to attain these goals [1].

The onset of the COVID-19 pandemic served as a pivotal moment, compelling several enterprises to transition to digital platforms for survival. Organizations that have previously used digital technology demonstrated enhanced resilience and continuity relative to their conventional counterparts. The surge in digital usage during this period highlighted the need of technology preparedness in confronting external disruptions.

Notwithstanding these benefits, the adoption of digital technology among Indian SMEs is still very low and inconsistent. A 2020 research by Kumar and Pandey revealed that infrastructural deficiencies—such as inconsistent internet connectivity and electricity—particularly in Tier-II and rural regions, substantially hinder digital preparedness. Moreover, numerous SMEs exhibit deficiencies in digital literacy and a proficient staff, hindering their ability to efficiently deploy and manage new technologies. The financial burden of digitization, encompassing setup, training, and upkeep, sometimes seems excessive, particularly for micro-enterprises and family-owned organizations [2].

A significant issue is the resistance to change, which arises from ambiguity over technological results and apprehension about job displacement (Kotter, 1996). Small and medium-sized business owners, sometimes lacking extensive experience with sophisticated information and communication technologies, are reluctant to modify established workflows without a clearly

defined return on investment. The "wait-and-watch" mentality hinders innovation and exacerbates the competitive disparity between technologically advanced and behind organizations.

Digital technology has become an essential element of contemporary life, altering the operations of individuals, corporations, and governments. Technologies include artificial intelligence, cloud computing, big data analytics, mobile apps, and the Internet of Things have transformed communication, service delivery, and decision-making processes. With the rapid advancement of digital transformation worldwide, the integration of digital technologies is widely recognized as a crucial element in enhancing efficiency, innovation, and competitiveness across diverse industries [3].

Notwithstanding the extensive accessibility of digital technology, their implementation remains irregular and disparate. Numerous individuals and companies encounter difficulties in completely assimilating digital technologies into their everyday operations owing to various technological, organizational, and socio-economic obstacles. Challenges such as inadequate digital infrastructure, elevated implementation expenses, insufficient technical proficiency, and reluctance to change frequently obstruct successful adoption. Moreover, issues pertaining to data privacy, cybersecurity, and legal ambiguity exacerbate the adoption process, especially in developing and resource-limited contexts.

Simultaneously, several elements function as facilitators that promote and endorse the use of digital technology. These encompass robust leadership endorsement, favorable user perceptions, sufficient training and skill enhancement, recognized utility and user-friendliness of technology, and conducive organizational and governmental regulations. The presence of these enabling variables increases the likelihood of acceptance and effective implementation of digital technologies, resulting in enhanced performance and long-term sustainability.

Due to the intricate interaction of obstacles and enablers, there is an increasing necessity for a thorough comprehension of the elements affecting digital technology adoption. This review study seeks to comprehensively identify and assess the principal obstacles and enablers documented in the available research. The project aims to synthesize previous research findings

to establish a structured framework that would assist policymakers, practitioners, and academics in formulating successful strategies for promoting inclusive and sustainable digital adoption.

II. REVIEW OF LITERATURE

Israel et al. [4] assert that digital technologies transform the healthcare landscape, with several research indicating obstacles and enablers to the utilization of digital treatments by healthcare professionals (HPs). We aggregated the information from current systematic studies identifying challenges and facilitators to the utilization of digital health technology by healthcare professionals. Electronic searches were conducted across five databases (Cochrane Database of Systematic Reviews, Embase®, Epistemonikos, MEDLINE®, and Scopus) from their creation until March 2023. We incorporated evaluations that identified impediments or facilitators to the utilization of technological solutions among healthcare professionals. Data abstraction, methodology evaluation, and evidence certainty appraisal were conducted by a minimum of two authors. In all, 108 reviews encompassing physicians, pharmacists, and nurses were included. Robust evidence indicated that infrastructure and technical obstacles (Relative Frequency Occurrence [RFO] 6.4% [95% CI 2.9–14.1]), psychological and personal challenges (RFO 5.3% [95% CI 2.2–12.7]), and apprehensions regarding extended working hours or increased workload (RFO 3.9% [95% CI 1.5–10.1]) were prevalent issues reported by healthcare professionals. Similarly, robust data indicates that training and educational programs, multisector incentives, and the impression of technological efficacy promote the adoption of digital technologies by healthcare professionals (RFO 3.8% [95% CI 1.8–7.9]). Our findings indicated that physical and technological challenges, psychological impediments, and workload-related difficulties are significant obstacles to the full and holistic adoption of digital health technology by healthcare professionals. In contrast, implementing training, assessing HP's sense of utility and readiness to use, together with incentives for many stakeholders, are essential facilitators to improve HP adoption of digital treatments.

According to the research conducted by Chiara et al. [5], the integration of digital therapies for mental health has proven challenging, despite the potential benefits for population mental health and well-being. This qualitative systematic study sought to identify barriers and facilitators to the

use of digital technologies in mental healthcare systems and to align these with an implementation framework to guide policy development. We conducted a search of Medline, Embase, Scopus, PsycInfo, Web of Science, and Google Scholar for primary research publications published from January 2010 to 2022. Studies were deemed suitable if they documented hurdles and/or facilitators to the incorporation of any digital mental health technologies. Data were retrieved via EPPI-Reviewer Web and analyzed thematically through inductive and deductive cycles. Out of 12,525 initially found references, 81 papers were incorporated into the final analysis. Barriers and facilitators were categorized within an implementation (evidence-practice gap) framework spanning six domains, organized by four tiers of mental healthcare systems. The implementation was broadly obstructed by the view of digital technologies as impersonal instruments that impose extra caregiving responsibilities on both providers and patients, alter relational power dynamics, a lack of resources, and regulatory complexities that hinder access to universal coverage. Facilitators encompassed person-centered approaches that account for patients' intersectional characteristics, such as gender, class, disability, and illness severity; evidence-based training for providers; collaboration among colleagues; adequate investment in human and financial resources; and policy reforms addressing universal access to digital health. It is essential to acknowledge the intricate and interconnected nature of obstacles across all domains and tiers of the mental health system. To enable an equitable, sustainable, and enduring digital transformation of mental health systems, policymakers have to adopt a systematic approach that fosters collaboration between the public and commercial sectors to guide evidence-based planning and enhance mental health systems.

According to the research by Bidmead and McShane[6], the NHS Long Term Plan advocates for "digital-first" solutions; yet, numerous effective ideas do not succeed. Obstacles to digital innovation in healthcare are well-documented and frequently anticipated. This study intends to elucidate concerns to be considered in implementation. This is a qualitative research examining the experiences associated with telehealth deployment. Staff participation is essential for acceptability; alignment with existing practices is beneficial, but when unfeasible, redesigning the approach is imperative. The concept suggests that employees at any level may become digital champions; yet, this job poses difficulties for those lacking authority. Funding mechanisms may hinder adoption owing to the influence of associated savings on other areas within the system.

Organizational support for innovation is frequently evident but fails to permeate to the service level adequately. Senior management must spearhead and facilitate the introduction of digitally enabled healthcare at a micro level. Funders and commissioners must acknowledge that innovation requires time and that methodical methods provide greater results.

Chavi[7] asserts that the Information and Communications Technology (ICT) revolution has significantly enhanced global connectedness and infiltrated several facets of contemporary human existence. The advantages of ICT can only be utilized by individuals who possess access to the technology and the skills to employ it effectively. India's use of ICT has progressed swiftly since 2000, however significant discrepancies persist throughout the nation. This study examines the factors associated with ICT adoption and its use capacities in India. Income, education, and household demographics are significant predictors of household ICT adoption, whereas education, age, and gender are key classifiers for variances in individual ICT usage skills. The findings will facilitate informed debates regarding strategic decisions to address India’s digital divide.

III. BARRIERS IN THE ADOPTION OF DIGITAL TECHNOLOGY

Obstacles substantially impede the efficient adoption of digital technology by restricting access, acceptability, and appropriate exploitation of digital systems. Significant obstacles encompass insufficient digital competencies and technical expertise, elevated implementation and upkeep expenses, reluctance to adapt, and deficient digital infrastructure. Numerous individuals and organizations have difficulties in adopting digital technology owing to inadequate training and limited digital literacy, which diminishes confidence and heightens reliance on conventional ways. Financial limitations also impede adoption, especially for small enterprises and institutions that lack the means for infrastructure enhancements, software procurement, and ongoing maintenance. Moreover, resistance to change stemming from apprehension over job loss, interruption of established procedures, and confusion about new technology adversely impacts user acceptability. Issues pertaining to data privacy, cybersecurity, and regulatory obstacles also hinder adoption [8]. These hurdles together lead to postponed adoption, insufficient usage of

digital technologies, diminished efficiency, and restricted attainment of the potential advantages of digital transformation across many industries.

1. Lack of Digital Skills and Technical Knowledge

The deficiency of digital competencies and technical expertise is a significant obstacle to the use of digital technologies. Digital technologies frequently necessitate users to have fundamental to sophisticated skills, including software program operation, digital data management, comprehension of cybersecurity protocols, and adaptability to continual technological advancements. When individuals or workers lack these competencies, they often experience discomfort and insecurity when utilizing digital tools, which diminishes their propensity to embrace new technology.

The skills gap is more pronounced in developing nations, rural locales, and conventional enterprises where access to digital education and training possibilities is restricted. Veteran personnel and novice technology users may struggle to adapt to swiftly evolving digital landscapes. Consequently, enterprises encounter diminished user acceptability, recurrent faults, and inefficiencies in the utilization of digital systems. Despite the effective implementation of digital technologies, they frequently remain underused owing to insufficient user proficiency. The consequences of inadequate digital abilities are substantial. Organizations may have diminished productivity, heightened operational mistakes, and elevated expenses associated with ongoing technical assistance and system maintenance. Innovation and digital inventiveness are constrained, since people lack the confidence to engage with complex features or novel digital solutions. The lack of digital skill development exacerbates the digital gap across individuals, companies, and regions, hindering inclusive growth and sustainable digital transformation.

2. High Cost of Implementation and Maintenance

Significant installation and maintenance expenses constitute a substantial barrier to the adoption of digital technology. The adoption process often requires significant financial expenditure on hardware, software licensing, internet infrastructure, data storage, cybersecurity solutions, and

ongoing system improvements. Moreover, firms must designate resources for staff training, technical assistance, and system adaptation, so exacerbating the overall financial burden.

Small and medium-sized firms (SMEs), educational institutions, and public sector entities are most impacted by budgetary limitations. Constrained funds compel decision-makers to prioritize immediate operational requirements above long-term digital expenditures. Consequently, digital adoption may be postponed, partially executed, or entirely forsaken. Organizations can implement obsolete or substandard digital systems that do not yield anticipated advantages [9].

The consequences of elevated prices encompass diminished digital competitiveness and restricted access to modern technology. Organizations without the financial capacity for digital investments frequently have difficulties in enhancing efficiency, service delivery, and customer happiness. Furthermore, budgetary constraints may result in inadequate maintenance procedures, leading to system failures, data loss, and security risks. Over time, elevated expenses exacerbate technical inequality, enabling only financially robust firms to fully capitalize on digital transformation, while others fall behind.

3. Resistance to Change and Organizational Culture

Resistance to change is a behavioral and cultural impediment that profoundly impacts the adoption of digital technologies. Employees and management may cultivate a profound commitment to conventional work processes and may regard digital technology as disruptive or menacing. Concerns around job displacement, heightened effort, less control, and distrust in technology foster unfavorable perceptions of digital adoption.

Organizational culture significantly influences employees' views and adoption of new technology. In businesses characterized by inflexible systems, inadequate communication, and minimal employee engagement, resistance to change is more evident. Employees may deliberately refrain from utilizing digital technologies or engage with them just to fulfill basic obligations. This conduct diminishes the efficacy of digital activities and restricts the anticipated return on investment.

Resistance to change results in diminished user engagement, unsuccessful implementations, and suboptimal utilization of digital technology. Digital initiatives may encounter postponements, heightened expenses, and diminished performance advantages. In the long run, firms that neglect to cultivate a culture of innovation and flexibility jeopardize their competitive position and diminish their responsiveness to technological progress. Surmounting opposition necessitates robust leadership, efficient change management tactics, and ongoing communication to foster trust and promote the acceptance of digital technology.

IV. FACILITATORS IN THE ADOPTION OF DIGITAL TECHNOLOGY

Facilitators are crucial in fostering the successful adoption of digital technology by establishing conducive circumstances for acceptance and effective utilization. Essential enablers encompass robust leadership commitment, accessibility of digital skills and training, and the perceived utility and user-friendliness of digital technologies. Leadership endorsement facilitates the formulation of a coherent digital vision, guarantees the allocation of resources, and mitigates user opposition to change. Ongoing training and skill enhancement bolster user confidence and proficiency, allowing users to utilize digital technologies effectively and adjust to technological advancements. Moreover, when digital technologies are intuitive and exhibit evident advantages such as enhanced performance, time efficiency, and precision, people are more inclined to embrace and incorporate them into their everyday routines [10]. A supportive corporate culture and facilitating government policies enhance digital adoption by promoting innovation and provide essential infrastructure and incentives. Collectively, these facilitators mitigate adoption obstacles, encourage sustained utilization of digital technology, and enhance efficiency, creativity, and enduring digital transformation.

1. Strong Leadership Support and Strategic Vision

Strong leadership support and a clear strategic vision are among the most influential facilitators of digital technology adoption. Leadership plays a critical role in setting priorities, allocating resources, and shaping organizational attitudes toward digital transformation. When top management actively supports digital initiatives, it signals the importance of technology adoption to employees and reduces uncertainty and resistance to change. Leaders who communicate a

clear digital vision help align digital technologies with organizational goals, making adoption more purposeful and goal-oriented.

Effective leaders also facilitate adoption by providing the necessary financial, human, and technological resources. This includes investing in infrastructure, approving budgets for training programs, and appointing digital champions or change agents to guide implementation. Leadership involvement encourages cross-departmental collaboration and ensures that digital initiatives are not treated as isolated technical projects but as integral components of organizational strategy.

The outcomes of strong leadership support include higher user acceptance, smoother implementation processes, and improved organizational performance. Employees are more likely to engage with digital technologies when they perceive management commitment and long-term support. Additionally, leadership-driven digital strategies promote innovation, agility, and continuous improvement. In contrast, the absence of leadership support often results in fragmented adoption efforts and limited long-term success, highlighting leadership as a critical facilitator of digital technology adoption.

2. Digital Skills, Training, and User Competence

Digital skills and continuous training significantly facilitate the adoption of digital technology by enhancing user confidence and competence. When individuals possess the necessary technical knowledge, they are more willing to accept and effectively use digital tools. Training programs help users understand system functionalities, troubleshoot basic issues, and adapt to technological changes, thereby reducing anxiety and resistance.

Organizations that prioritize digital skill development create an environment conducive to innovation and experimentation. Formal training sessions, workshops, e-learning platforms, and peer learning opportunities enable users to build both basic and advanced digital competencies. Skilled users are more likely to explore advanced features of digital technologies, leading to better utilization and higher productivity [11].

The presence of digitally competent users results in several positive outcomes. These include improved system efficiency, reduced errors, lower dependency on external technical support, and faster return on investment. Furthermore, digital literacy promotes adaptability, enabling individuals and organizations to respond effectively to emerging technologies. By investing in skill development, organizations not only facilitate technology adoption but also support long-term digital sustainability and workforce readiness.

3. Perceived Usefulness and Ease of Use of Technology

Perceived usefulness and ease of use are key psychological factors that strongly influence digital technology adoption. According to technology acceptance theories, users are more likely to adopt digital tools if they believe the technology will enhance their performance and is easy to operate. Technologies that simplify tasks, save time, and improve accuracy are more readily accepted by users.

User-friendly design, intuitive interfaces, and reliable system performance increase user satisfaction and reduce learning effort. When digital technologies align with users' needs and existing workflows, adoption becomes more seamless. Organizations that involve users in the design and selection of digital systems often achieve higher acceptance levels, as technologies are better tailored to actual user requirements.

The outcomes of high perceived usefulness and ease of use include faster adoption rates, sustained usage, and improved organizational efficiency. Users are more motivated to integrate digital tools into their daily activities, leading to better performance and innovation. Thus, designing and implementing user-centric technologies serves as a powerful facilitator in achieving successful and sustainable digital technology adoption.

V. CONCLUSION

The integration of digital technology is crucial for attaining efficiency, innovation, and sustainable growth in several areas. This analysis emphasizes that digital adoption is a multifaceted process shaped by several interconnected obstacles and enablers. Prominent

obstacles highlighted in the research encompass insufficient digital competencies and technical expertise, elevated implementation and maintenance expenses, reluctance to adapt, poor infrastructure, and apprehensions about data privacy and security. These obstacles persist in hindering the efficient deployment of digital technology, especially in emerging countries and resource-limited businesses.

The review emphasizes the significance of facilitators that greatly promote the use of digital technologies. Elements include robust leadership endorsement, favorable user perceptions, sufficient training and skill enhancement, perceived utility and user-friendliness, a conducive company culture, and facilitating governmental regulations are pivotal in surmounting adoption obstacles. When these facilitators are properly linked, firms are more adept at incorporating digital technology into their processes and attaining enhanced performance results.

This review's conclusions indicate that tackling obstacles in isolation is inadequate; a comprehensive and strategic strategy is necessary instead. Policymakers ought to prioritize the formulation of inclusive digital policy, enhancement of infrastructure, and advancement of digital literacy efforts. Organizational leaders must provide resources to change management methods, ongoing training, and employee involvement to promote the acceptance of digital technology. Moreover, academics are urged to undertake empirical and sector-specific investigations to enhance comprehension of contextual factors affecting adoption.

The effective adoption of digital technology relies on the equitable handling of both obstacles and enablers. By using facilitating elements and methodically diminishing limitations, stakeholders may expedite digital transformation and guarantee that the advantages of digital technology are broadly and sustainably achieved.

REFERENCES

1. NHS. NHS Long Term Plan. https://www.longtermplan.nhs.uk/online-version
2. Ross, J., Stevenson, F., Lau, R. and Murray, E. (2016) Factors That Influence the Implementation of e-Health: A Systematic Review of Systematic Reviews (An Up date). Implementation Science, 11, Article No. 146. https://doi.org/10.1186/s13012-016-0510-
3. Greenhalgh, T., Wherton, J. and Papoutsi, C. (2017) Beyond Adoption: A New Framework for Theorizing and Evaluating Nonadoption, Abandonment, and Challenges to the Scale-Up, Spread, and Sustainability of Health and Care Technologies. Journal of Medical Internet Research, 19, e367. https://doi.org/10.2196/jmir.8775
4. Borges do Nascimento, I. J., Abdulazeem, H., Vasanthan, L. T., Martinez, E. Z., Zucoloto, M. L., Østengaard, L., Azzopardi-Muscat, N., Zapata, T., &Novillo-Ortiz, D. (2023). Barriers and facilitators to utilizing digital health technologies by healthcare professionals. *NPJ digital medicine*, *6*(1), 161. https://doi.org/10.1038/s41746-023-00899-4
5. Berardi, C., Antonini, M., Jordan, Z. et al. Barriers and facilitators to the implementation of digital technologies in mental health systems: a qualitative systematic review to inform a policy framework. BMC Health Serv Res 24, 243 (2024). https://doi.org/10.1186/s12913-023-10536-1.
6. Bidmead, E. and McShane, C. (2021) Barriers and Facilita tors to Implementation of Digital Solutions. Health, 13, 1330-1345. https://doi.org/10.4236/health.2021.1311097
7. ChaviAsrani (2020), Bridging the Digital Divide in India: Barriers to Adoption and Usage; June 2020
8. Brewster, L., Mountain, G., Wessels, B., Kelly, C. and Hawle, M. (2013) Factors Affecting Frontline Staff Acceptance of Telehealth Technologies: A Mixed-Method Systematic Review. Journal of Advanced Nursing, 70, 21-33. https://doi.org/10.1111/jan.12196
9. Wade, V., Eliott, J., Karnon, J. and Elshaug, A.G. (2010) A Qualitative Study of Sustainability and Vulnerability in Australian Telehealth Services. Studies in Health Technology and Informatics, 161, 190-201.

10. Zanaboni, P. and Wootton, R. (2016) Adoption of Routine Telemedicine in Norwegian Hospitals: Progress over 5 Years. BMC Health Services Research, 16, Article No. 496. https://doi.org/10.1186/s12913-016-1743-5
11. Bidmead, E. and Marshall, A. (2020) Covid-19 and the "New Normal": Are Remote Video Consultations Here to Stay? British Medical Bulletin, 135, 16-22. https://doi.org/10.1093/bmb/ldaa025