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## **Foreword**

We are privileged to release the **Volume 15, Issue II** of *Sri Lanka Journal of Advanced Research Studies in Humanities and Social Sciences (SLJARS)* encompassing new research findings, mostly with latest topics with a multi-disciplinary approach for the academia with the aim of awakening new researching and policy-oriented discussions for the sustenance of the society. The research carried out in SLJARS are mostly focused on though, all of them have very much dealt with scientific analytical methods and skills which reflect their methodical and philosophical basis for the final outcome of the research findings. The journals of SLJARS welcome the research outputs belonging to Humanities, Social Sciences, Law, Education and Management Studies with the broader understanding of the the mandate of the National Centre for Advanced Studies in Humanities and Social Sciences (NCAS). This issue in particular, deals with most of the scientific ventures such as FinTech, EdTech, digital library scaling, which are rapidly growing with the innovation of technology-based systems where the disciplines of humanities and social sciences are not exempted. The research outcome of all these articles evokes the need for extensive studies on such areas. I am sure that the readers of these articles will find it so interesting that we need our engagement for the amalgamation of such technologies in our behavioral surveys too using multi-disciplinary strategic approaches.

As the only research institute in Sri Lanka governed by the *Universities Act No. 16 of 1978*, NCAS remains committed to promote and extend high-quality research that integrates academic rigor with societal relevance. It is a known fact that the rapid technological changes cannot overstate the undeniable values of human behaviour and needs, importance of human intellect, ethical and natural judgment, and cultural understanding. Research on human behaviour, society and cultural identities continues to play a pivotal role in addressing contemporary challenges and informing evidence-based decision-making.

SLJARS is a **peer-reviewed journal**, published biannually under a **double-blind review process**, and has been recognized by *Sri Lanka Journals Online (SLJOL)* since 2007. The journal continues to serve as a respected platform for scholarly dialogue and intellectual exchange at national and international levels.

I extend my sincere gratitude to the authors, reviewers, and the editorial team for their dedication and scholarly commitment. Their efforts ensure the continued academic integrity and relevance of the journal. I am confident that the research presented in this issue will inspire future scholarship and contribute constructively to the advancement of knowledge and society.

**Professor (Mrs.) Prashanthi Narangoda**  
Director/NCAS

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## **Harassment of Foreign Tourists in Cultural Triangle of Sri Lanka**

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### **Abstract**

Tourist safety is a critical determinant of destination choice, satisfaction, and repeat visitation, yet tourist harassment remains a persistent challenge in Sri Lanka. This qualitative, exploratory study examines the forms and consequences of harassment experienced by foreign tourists and explores stakeholder-based strategies to enhance destination safety in the cultural triangle in Sri Lanka. Guided by an interpretivist research philosophy, data were collected through semi-structured interviews, non-participant observations, and secondary sources, and analyzed using thematic analysis. The discussion draws on cognitive appraisal theory, destination image theory, and stakeholder theory as complementary frameworks for interpreting tourists' emotional appraisals, destination image dynamics, and stakeholder responsibilities. Findings reveal that harassment such as verbal abuse, intrusive solicitation, sexual advances, and overpricing generates fear, frustration, and avoidance behaviors, negatively shaping tourist experiences and perceptions of safety. Repeated negative encounters, amplified through social media and peer reviews, undermine Sri Lanka's destination image, while fragmented institutional responses contribute to underreporting and persistence of harassment.

**Keywords:** Tourist Harassments in Sri Lanka, Tourist Safety, Cultural Heritage Tourism, Destination image, Cultural Triangle, Sustainable tourism

### **Introduction**

Tourism is widely recognized as a key driver of economic growth, employment generation, and cultural exchange across the globe. For many

developing countries, tourism functions not only as a source of foreign exchange but also as a mechanism for regional development and community empowerment. Sri Lanka, endowed with rich cultural heritage, biodiversity, and historical landmarks, has positioned tourism as a strategic pillar of national development (Samarathunga & Naria, 2025). Among its key attractions, the Cultural Triangle encompassing Anuradhapura, Polonnaruwa, Sigiriya, Dambulla, and Kandy holds exceptional significance due to its UNESCO World Heritage sites and religious importance. However, the sustainability and competitiveness of tourism in these destinations are increasingly challenged by concerns related to tourist safety and harassment.

Safety is a fundamental component of the tourism experience and a decisive factor influencing destination choice, tourist satisfaction, and repeat visitation (George, 2003; Kozak, 2007). Tourists' perceptions of personal security directly shape destination image and behavioural intentions. When tourists encounter threatening or uncomfortable situations, such as harassment, their overall evaluation of the destination deteriorates, often resulting in negative word-of-mouth and avoidance behaviours (Alrawadieh et al., 2019). In the contemporary digital era, such experiences are rapidly disseminated through online travel platforms and social media, amplifying reputational damage far beyond the individual incident. Tourist harassment is broadly defined as unwelcome, intrusive, or aggressive behaviors directed at tourists, including persistent solicitation, verbal abuse, sexual harassment, physical intimidation, and illicit activities such as drug solicitation (De Albuquerque & McElroy, 2001; Kozak, 2007). Scarlett (2024) further conceptualize tourist harassment as unwanted contact legal or illegal that causes discomfort and disrupts the tourist experience. These behaviors represent not merely social inconveniences but serious service failures that undermine the principles of hospitality and ethical tourism (McElroy, Tarlow, & Carlisle, 2007). Existing literature identifies tourist harassment as a multidimensional and context-specific phenomenon. Otoo et al. (2019) distinguish between passive forms of harassment, such as repeated solicitation or invasion of personal space, and aggressive forms involving threats

or coercion. Kozak (2007) classifies harassment into five categories; vendor pestering, sexual solicitation, verbal abuse, physical aggression, and drug-related contact. Importantly, many incidents remain unreported due to normalization, resignation, fear of retaliation, or lack of confidence in local complaint mechanisms (Otoo et al., 2019).

Despite the presence of a Tourist Police Division and general legal provisions under Sri Lanka's Penal Code, there is no comprehensive legal or policy framework specifically addressing tourist harassment. As a result, many incidents go unresolved, reinforcing underreporting and allowing harassment to persist. Stakeholder coordination among tourism authorities, law enforcement agencies, local communities, and private-sector actors remains weak, further exacerbating the issue (Jamal & Stronza, 2009). From a theoretical standpoint, much of the existing literature on tourist harassment focuses on coastal or nightlife destinations, with limited attention given to heritage and religious tourism contexts such as Sri Lanka's Cultural Triangle. Moreover, while prior studies document the forms and impacts of harassment, fewer studies integrate tourists' cognitive and emotional responses with destination image outcomes and stakeholder responsibilities. This reveals a significant knowledge gap, particularly in understanding how harassment in culturally sensitive heritage destinations affects tourist perceptions and how coordinated stakeholder strategies can mitigate these impacts. In practice, addressing tourist harassment requires more than isolated law enforcement actions. Stakeholder Theory emphasizes that tourism safety is a shared responsibility involving government authorities, tourism businesses, local communities, and visitors themselves (Silva-Santisteban Mondoñedo, 2021). Without coordinated, stakeholder-based strategies supported by clear legal and institutional frameworks, efforts to enhance tourist safety remain fragmented and ineffective.

Given the growing importance of the Cultural Triangle to Sri Lanka's tourism economy and global image, there is an urgent need for a comprehensive investigation into tourist harassment within this context. In response to these gaps, this study has three primary objectives.

- To explore the different forms of harassment faced by foreign tourists visiting Cultural Triangle of Sri Lanka
- To identify the post-harassment behaviors and responses of foreign tourists following harassment incidents in Cultural Triangle of Sri Lanka
- To make recommendations for enhancing Sri Lanka's image as a safer destination for foreign tourists.

Therefore, the purpose of this study is to examine the forms and consequences of harassment experienced by foreign tourists in Sri Lanka's Cultural Triangle and to identify stakeholder-based strategies that can enhance destination safety, protect tourists, and strengthen Sri Lanka's image as a safe and sustainable tourism destination.

## **Literature Review**

### **Tourist Harassment**

Tourist harassment refers to any unwanted behavior directed at tourists that causes discomfort, fear, or distress and undermines the quality of the tourism experience (De Albuquerque & McElroy, 2001). It includes a wide spectrum of actions such as aggressive solicitation, verbal abuse, sexual advances, physical intimidation, drug-related approaches, and economic exploitation through overcharging or scamming (Kozak, 2007). Such behavior represents a breakdown in expected host-guest interactions and is often described as an "encounter failure" within tourism settings (Alrawadieh et al., 2019). Research indicates that tourist harassment is particularly prevalent in destinations with large informal service sectors and weak regulatory enforcement. In Sri Lanka's coastal destinations, studies have identified multiple forms of harassment, including consumption-based selling pressure, vocal and sexual harassment, and persistent solicitation by unlicensed vendors and beach boys (Wijesundara & Gnanapala, 2020; Jayasinghe & Ratnayake, 2018). Similar patterns are observed globally, with studies from Turkey and the Middle East reporting reduced tourist satisfaction, negative word-of-mouth, and weakened destination loyalty following

harassment experiences (Çetinkaya & Öter, 2024; Alrawadieh et al., 2019).

<b>Form</b>	<b>Definition</b>	<b>Common Areas</b>	<b>Main Effects</b>	<b>Key References</b>
<b>Aggressive Solicitation</b>	Persistent, coercive selling behavior causing discomfort.	Beaches, markets	Anxiety, avoidance of local interaction	Scarlett (2024); Kozak (2007)
<b>Verbal Abuse</b>	Hostile or offensive language aimed at tourists.	Towns, coastal zones	Embarrassment, fear	Wijesundara & Gnanapala (2020); Kozak (2007)
<b>Sexual Harassment</b>	Unwelcome sexual comments, touching, or stalking.	Nightlife, beach areas	Trauma, restricted movement	Boakye (2010); Alrawadieh et al. (2019)
<b>Overpricing/ Scams</b>	Charging unfair prices or using deceptive tactics.	Shops, transport hubs	Financial loss, distrust	Arachchi (2020); Jayasinghe & Ratnayake (2018)
<b>Drug Solicitation</b>	Offering or pressuring tourists to buy illegal substances.	Beach parties, nightlife zones	Legal risk, discomfort	Wijesundara & Gnanapala (2020)
<b>Physical Intimidation</b>	Threatening presence or gestures to manipulate or scare.	Isolated paths, night areas	Fear, early departure	Kozak (2007); Alrawadieh et al. (2019)

Table I: Types of Harassments Summary Table

Beyond immediate discomfort, tourist harassment has long-term implications for destination image, visitor behavior, and community-based tourism benefits. Even isolated incidents, when shared through online platforms, can significantly damage destination reputation (Shen, et al. 2015). Consequently, tourist harassment is increasingly recognized not merely as individual misconduct, but as a structural and governance-related challenge within tourism systems.

Tourist harassment has serious psychological, behavioral, and economic consequences for both visitors and destinations. At the individual level, harassment undermines tourists' emotional well-being and overall travel satisfaction. Experiences such as verbal abuse, aggressive selling, or sexual advances often generate fear, anxiety, and embarrassment, disrupting leisure and relaxation (De Albuquerque & McElroy, 2001). Empirical studies show that repeated harassment significantly reduces tourist satisfaction and alters travel plans (Çetinkaya & Öter, 2024; Jayasinghe & Ratnayake, 2018). Harassment also negatively affects destination image and tourist behavior. Tourists who experience harassment are less likely to revisit or recommend a destination and are more inclined to share negative reviews online, amplifying reputational damage (Kozak, 2007; Arachchi, 2020). Research further indicates that harassment leads to avoidance behaviors, such as limiting outdoor activities or interactions with locals, thereby reducing tourist expenditure and community-level benefits (Badu-Baiden et al., 2016; Chepkwony & Kangogo, 2013). Tourist harassment weakens host-guest relationships, discourages cultural exchange, and poses a significant barrier to sustainable tourism development (Wijesundara & Gnanapala, 2020; Alrawadieh et al., 2019).

Tourist harassment is strongly influenced by gender and cultural factors, with women especially solo female travelers being at higher risk. Globally, female tourists often experience catcalling, sexual innuendos, and unwanted physical proximity, influenced by perceptions of their economic status and cultural background (Kozak, 2007; Çetinkaya & Öter, 2024). Cultural misunderstandings and local gender norms further exacerbate these risks, shaping both the frequency and severity of harassment incidents. In Sri Lanka, studies at destinations such as

Hikkaduwa reveal that female tourists are frequently followed, stared at, or persistently approached in beach and nightlife areas, often normalized by local service providers (Jayasinghe & Ratnayake, 2018; Arachchi, 2020). High-profile public incidents in Colombo in 2024, widely shared on social media, underscore the visibility and persistence of this issue (Daily Mirror, 2024; Sunday Times, 2024). Cultural differences in dress, behavior, and social interaction contribute to misinterpretation, while race and nationality also intersect with gender to shape harassment experiences (De Albuquerque & McElroy, 2001; Senewirathne, 2012). Addressing these gendered and cultural dimensions requires targeted training, awareness campaigns, and enforcement mechanisms to ensure inclusive and safe tourism environments (Wijesundara & Gnanapala, 2020).

Globally, tourist harassment produces similar consequences. In Petra, Jordan, tourists avoided vendors and spent less at attractions following harassment (Alrawadieh et al., 2019). Çetinkaya and Öter (2024) found that verbal abuse and persistent solicitation in Istanbul reduced satisfaction and loyalty, particularly for solo Western female travelers. In Egypt, Luxor tourists reported emotional distress and insecurity due to aggressive vendors (Kozak, 2007). McElroy, Tarlow, and Carlisle (2007) emphasized stakeholder cooperation, codes of conduct, and community awareness as essential mitigation strategies in the Caribbean and Morocco. Studies in Kenya (Chepkwony & Kangogo, 2013) and Ghana (Badu-Baiden et al., 2016) showed harassment limited tourist activities and local economic benefits, while Khairat (2016) highlighted negative effects on destination reputation. Collectively, these findings show that harassment universally undermines tourist satisfaction, loyalty, and destination sustainability.

### **Tourist harassment and Sri Lanka Tourism**

Tourist harassment, particularly against women, poses a significant threat to Sri Lanka's reputation as a safe and welcoming destination. High-profile incidents in Colombo and other urban areas have highlighted the vulnerability of solo female travelers, raising safety concerns that are echoed in both media reports

and academic studies (Daily Mirror, 2024). In coastal destinations such as Hikkaduwa, Mirissa, and Unawatuna, harassment by beach boys, vendors, and informal service providers has led to discomfort, fear, and reduced engagement with local communities (Jayasinghe & Ratnayake, 2018; Arachchi, 2020). The consequences extend beyond individual experiences. Harassment diminishes destination image, as tourists share negative feedback via word-of-mouth and online platforms, discouraging potential visitors and reducing repeat visitation (Kozak, 2007; Alrawadieh et al., 2019). Economically, tourists often restrict activities to pre-arranged tours or hotel premises, limiting spending in local businesses and weakening community-based tourism benefits (Samarathunga, Schänzel & Perera, 2025; De Albuquerque & McElroy, 2001). Persistent harassment threatens visitor satisfaction, loyalty, and equitable economic distribution, undermining the long-term sustainability and competitiveness of Sri Lanka's tourism industry. Effective interventions through regulation, awareness, and stakeholder coordination are essential to mitigate these impacts.

Tourist harassment in Sri Lanka remains a critical challenge, partly due to gaps in legal and policy frameworks. While the Penal Code criminalizes verbal abuse, stalking, and assault, these provisions do not specifically address tourist-targeted harassment, resulting in inconsistent enforcement, particularly in informal spaces such as beaches, local transport, and markets (Wijesundara & Gnanapala, 2020). Recent administrative interventions include empowering the Tourist Police to monitor unauthorized service providers and unlicensed guides, as called for by the Tourism Ministry in 2022 (Sunday Times, 2024). However, enforcement remains limited due to under-resourced and under-trained personnel, and tourists often hesitate to report incidents because of language barriers or fear of inaction (Senewirathne, 2012). Comparative international practices suggest structured approaches are effective. Dedicated Tourist Police units, licensing schemes, and behavioral codes for vendors in countries such as India, Thailand, Morocco, and Caribbean islands have improved tourist safety and accountability (McElroy, Tarlow, & Carlisle, 2007). Scholars recommend that Sri Lanka adopt similar measures, including tourism-specific legislation, multi-language

complaint mechanisms, capacity-building for enforcement agencies, and awareness campaigns to foster a safer and more welcoming environment for tourists (Dissanayake & Samarathunga, 2021; Wijesundara & Gnanapala, 2020).

### **Theoretical Review**

Cognitive Appraisal Theory explains how tourists interpret and emotionally respond to harassment. According to Lazarus and Folkman (1984), tourists cognitively appraise whether an incident is threatening and assess their coping capacity. Studies show that harassment often triggers fear, anger, or embarrassment, leading tourists to adopt emotion-focused coping strategies such as avoidance, especially in destinations with weak reporting mechanisms (Boakye, 2010; Arachchi, 2020). These unresolved negative appraisals reduce satisfaction, word-of-mouth recommendations, and revisit intentions (Kozak, 2007). Destination Image Theory highlights how harassment damages both cognitive (safety, service quality) and affective (fear, discomfort) image components. Negative experiences, amplified through social media and online reviews, significantly harm destination reputation and loyalty (Crompton, 1979; Echtner & Ritchie, 1993). Stakeholder Theory emphasizes that tourist harassment reflects governance and coordination failures among tourism authorities, law enforcement, businesses, and local communities. Effective mitigation requires collaborative, inclusive stakeholder engagement rather than isolated interventions (Freeman, 1984; Wijesundara & Gnanapala, 2020). These theories frame tourist harassment as a psychological, reputational, and governance challenge, justifying an integrated analytical approach.

### **Research Gaps**

Despite the use of frameworks such as Cognitive Appraisal Theory, Destination Image Theory, and Stakeholder Theory, existing studies show significant theoretical limitations. Most research applies these frameworks in isolation, failing to capture the multidimensional nature of tourist harassment,

which spans psychological, institutional, socio-cultural, and media-related factors (Alrawadieh et al., 2019; Kozak, 2007). While gender is sometimes considered, overlapping identities such as race, nationality, age, and socio-economic background are rarely integrated into a cohesive theoretical model. Additionally, the role of media and technology particularly social media's influence on destination image and exposure of harassment incidents has not been systematically incorporated. Current theories predominantly focus on tourists' responses, leaving the motivations and socio-economic drivers behind local actors' harassing behaviors largely unexamined (De Albuquerque & McElroy, 2001).

Empirical studies are often geographically and temporally limited, focusing mainly on southern Sri Lankan beach areas and short observation periods (Jayasinghe & Ratnayake, 2018). Research rarely considers diverse tourist groups, such as solo women, LGBTQ+ travelers, or visitors from different cultural backgrounds, limiting understanding of varied harassment experiences. Stakeholder perspectives, including hotel staff, police officers, and street vendors, are underrepresented. Effectiveness of existing legal measures, safety programs, and digital tools remains largely unassessed (Senewirathne, 2012; Wijesundara & Gnanapala, 2020). Moreover, the attitudes of local communities toward tourist behavior and harassment are insufficiently studied. These gaps highlight the need for integrative, longitudinal, and multi-stakeholder research to inform comprehensive prevention and policy strategies.

## **Methodology**

This study employed a qualitative, exploratory methodology to investigate tourist harassment in Sri Lanka's Cultural Triangle, encompassing Kandy, Polonnaruwa, and Anuradhapura. A qualitative approach was selected to capture the subjective, emotional, and context-dependent experiences of foreign tourists and key stakeholders, including Tourist Police officers, government officials, and private sector actors such as hoteliers and tour operators (Creswell

& Poth, 2017; Farrow, De Liddo, & Okada, 2020). The interpretivist research philosophy guided the study, emphasizing that reality is socially constructed and that knowledge emerges from the interactions and interpretations of participants (Jansen, 2023; Rashid, 2023). This philosophical orientation is particularly suited to exploring harassment experiences, where perceptions and meanings vary across individuals and stakeholder groups.

An inductive research approach was adopted, allowing theory to emerge organically from empirical data rather than imposing preconceived frameworks (Vijayamohan, 2025; Saunders et al., 2019). This approach aligns with the study's theoretical foundation, including Cognitive Appraisal Theory, Destination Image Theory, and Stakeholder Theory, all of which emphasize the interpretation of emotions, social interactions, and institutional roles.

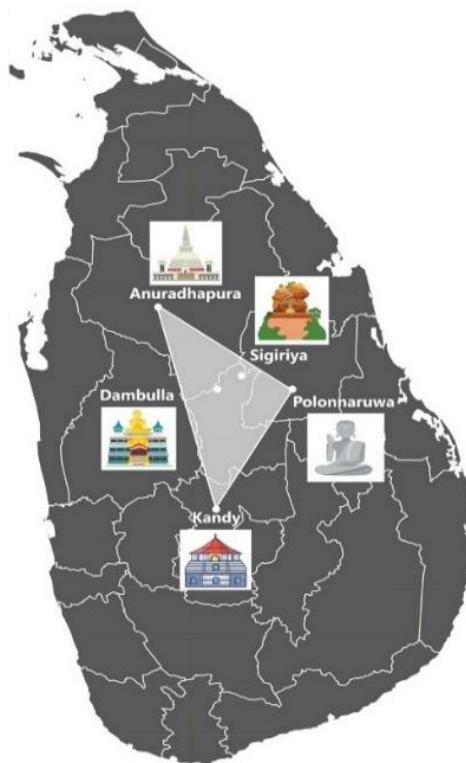


Figure I: Cultural triangle of Sri Lanka

Source: Alahakoon & Uduwara (2021)

Semi-structured interviews served as the primary data collection instrument, providing flexibility for participants to share detailed narratives and insights into harassment incidents, institutional responses, and perceived safety concerns (Kallio et al., 2016). Non-participant observations complemented interviews, enabling the researcher to record real-time tourist-local interactions, environmental conditions, and enforcement practices without interfering in natural behaviors (Angrosino, 2007). Secondary data sources, including government reports, media articles, and academic publications, were also analyzed to contextualize findings and triangulate primary data (Saunders et al., 2019).

The research design followed a qualitative exploratory framework, appropriate for investigating under-researched, socially complex phenomena such as tourist harassment (Rahi, 2017). An exploratory case study strategy was applied across three key destinations within the Cultural Triangle. This multi-site approach allowed for the comparison of experiences, stakeholder responses, and institutional practices across diverse socio-cultural and operational contexts (Yin, 2018; Baxter & Jack, 2008). The study's population included four main stakeholder groups: foreign tourists who had experienced or witnessed harassment, government tourism officials, Tourist Police officers, and private sector actors. A purposive, maximum variation sampling technique was used to select 23 formal participants, ensuring diversity in perspectives, roles, and institutional affiliations (Patton, 2014; Etikan, 2016; Palinkas et al., 2015). In addition, informal conversations with 65 tourists were conducted to supplement observational insights, although these were not included in the core qualitative dataset.

Semi-structured interviews were conducted in both Sinhala and English, depending on participant preference. Interviews were audio-recorded or documented through detailed note-taking based on consent and contextual feasibility. The interview guide consisted of open-ended questions, designed to elicit participants' perceptions, experiences, and recommendations regarding

tourist harassment. Observations were structured using checklists that recorded environmental settings, visible forms of harassment, responses by authorities, and interactions between tourists and locals. This multi-method approach ensured data triangulation, increasing the credibility and richness of findings (Creswell & Poth, 2017). The data collection took place mainly at the key tourist destinations within the cultural triangle including Kandy, Polonnaruwa, Habarana, Dambulla and Anuradhapura from February 2025 to May 2025.

<b>Stakeholder Category</b>	<b>Description</b>	<b>Number of Participants (n)</b>
Foreign Tourists	International visitors who experienced or witnessed harassment in Kandy, Polonnaruwa, or Anuradhapura.	2
Government Officials	Officials from the SLTDA and local tourism-related government units responsible for planning and safety.	8
Tourist Police Officers	Officers from the Tourist Police Division stationed in major tourism zones within the Cultural Triangle.	4
Private Sector Stakeholders	Tour operators, hoteliers, and other licensed service providers regularly engaging with tourists.	9
Total		23

Table II: Sample Summar

Data analysis was conducted using thematic analysis, following Braun and Clarke's (2006) six-phase framework. The process involved familiarization with transcripts, generating initial codes, collating codes into potential themes, reviewing and refining themes, defining and naming themes, and producing the final report.

This approach facilitated the identification of patterns related to harassment types, emotional impacts, stakeholder responses, and institutional gaps, while remaining inductive and data-driven. Trustworthiness was ensured through strategies addressing credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985; Nowell et al., 2017). Techniques included prolonged engagement, thick description, peer debriefing, member checking, audit trails, and triangulation across stakeholder groups.

## **Results/ Findings**

### **Harassments**

The theme of Harassments captures a range of unethical, intrusive, and exploitative practices encountered by foreign tourists during their interactions with local individuals and service providers within Sri Lanka’s Cultural Triangle.

<b>Theme</b>	<b>Focus Codes</b>	<b>Open Codes</b>
Harassments	Financial Deception	Overcharging, Dishonest Pricing, Misleading Services, Scams
	Intrusive & Unwanted Approaches	Persistent Pressure, Solicitation, Verbal Harassment
	Sexual harassment	Touched my breast, touched my leg, showed me his penis, touched her bud, Violence against women
	Property Infringement	Money being stolen, Stealing tourists’ bags and cameras, Steal cameras and wallets

Table III : Theme 1 - Harassments

Evidence from interviews and field observations indicates that these experiences stem largely from tourists’ unfamiliarity with local norms, language barriers, and reliance on informal or weakly regulated services. Such practices undermine core principles of hospitality and negatively affect tourists’ sense of comfort, safety, and trust. Four interconnected focus areas emerged under this

theme: financial deception, intrusive and unwanted approaches, sexual harassment, and property infringement. Financial deception was the most frequently reported form of harassment. Tourists commonly experienced overcharging, dishonest pricing, and misleading services, particularly in transport, guiding, and informal retail settings. Interview data revealed the presence of inflated prices for foreign visitors, the absence of transparent pricing mechanisms, and deceptive practices designed to extract higher payments.

Observations in Dambulla and Habarana further confirmed that the lack of meters, price displays, or standardized service rates enabled arbitrary and discriminatory pricing. Intrusive and unwanted approaches constituted another dominant pattern. Tourists reported persistent solicitation and pressure from vendors, drivers, and informal guides, even after clear refusals. These approaches often involved repeated following, verbal insistence, and disregard for personal boundaries. Observational data from Sigiriya and Polonnaruwa corroborated these accounts, showing that tourists were frequently approached multiple times within short distances, contributing to discomfort and reduced freedom of movement. Sexual harassment, though reported less frequently, emerged as a serious concern, particularly affecting female tourists. Interview participants described incidents involving inappropriate verbal remarks, boundary violations, and unprofessional conduct within certain service contexts such as transport and wellness facilities. These incidents were predominantly associated with informal or unlicensed service providers and were reported to cause significant emotional distress and feelings of insecurity. Property infringement was also identified as a notable issue. Reports included theft of money, bags, cameras, and personal belongings at major attractions. A recurring pattern involved theft occurring in crowded sites or moments of distraction, occasionally involving breaches of trust within service relationships. These findings demonstrate that harassment in the Cultural Triangle manifests through multiple, interconnected forms that compromise tourist safety, satisfaction, and destination image.

### **Tourist Experiences, Responses and Impact**

The theme Tourist Experiences, Responses and Impact reflect how foreign tourists respond to harassment incidents and how such experiences influence their emotions, behaviors, communication practices, and perceptions of Sri Lanka as a destination.

<b>Theme</b>	<b>Focus Code</b>	<b>Open Code</b>
Tourist Experiences & Impact	Emotional & Psychological Strain	Mental Pressure & Distress Anger & Frustration
	Behavioral Adaptations	Increased Caution & Vigilance, Self-Regulation & Polite Avoidance
	Reporting & Dissemination	Delayed & non-reporting Online Sharing & Reviews
	Impact on Destination Perception	Negative Image of Sri Lanka Reduced Revisit & Recommendation

Table IV : Theme 2 - Tourist Experiences, Responses & Impact

Findings from interviews and observations indicate that harassment produces immediate psychological effects, prompts adaptive behavioral strategies, shapes reporting practices, and contributes to longer-term reputational consequences for the destination. Four interconnected focus codes emerged: emotional and psychological strain, behavioral adaptations, reporting and dissemination, and impact on destination perception. Emotional and psychological strain was a prominent outcome of harassment experiences. Tourists reported mental pressure, discomfort, fear, and emotional distress following persistent solicitation, deception, or boundary violations. Several respondents described visible emotional reactions such as anxiety and distress when recounting incidents. Anger and frustration were also frequently expressed, particularly in

response to perceived unfair treatment, dishonesty, and verbal hostility. These emotional responses indicate that harassment disrupts the sense of relaxation and safety typically associated with leisure travel.

Behavioral adaptations constituted a common coping response. Tourists reported increased caution and vigilance, including heightened suspicion toward strangers, avoidance of certain locations or times of day, and closer attention to personal belongings. Self-regulation and polite avoidance strategies were also widely used, such as limiting eye contact, offering brief refusals, changing routes, or entering shops to disengage from persistent individuals. These adaptive behaviors reflect attempts to minimize risk while maintaining non-confrontational interactions. Reporting and dissemination patterns revealed a strong tendency toward delayed or non-reporting of incidents through formal channels. Emotional distress, time constraints, perceived inconvenience, and reluctance to engage with legal or administrative processes were cited as key barriers. Instead, many tourists opted to share their experiences through online platforms, including travel review websites and social media. These channels were commonly used to express dissatisfaction and warn other travelers. Harassment experiences significantly influenced destination perception. Respondents associated repeated negative encounters with a diminished sense of safety and trust, contributing to a negative image of Sri Lanka. This perception was closely linked to reduced intentions to revisit and a reluctance to recommend the destination to others. Collectively, these findings demonstrate that harassment has enduring consequences that extend beyond individual incidents, shaping tourist behavior, communication, and destination image.

### **Strategies for Mitigation & Prevention**

The theme Strategies for Mitigation & Prevention presents stakeholder-identified measures aimed at reducing tourist harassment and strengthening Sri Lanka's image as a safe and responsible destination.

<b>Theme</b>	<b>Focus Code</b>	<b>Open Code</b>
Strategies for Mitigation & Prevention	Enhanced Transparency & Information	Clear Pricing & Guidelines Accessible Tourist Information Cultural Awareness for Tourists Digital Information System & App
	Stronger Enforcement & Accountability	Increased Police Presence & Visibility Strict Legal Action & Punishment Licensing & Registration of Providers
	Collaborative Stakeholder Engagement	Stakeholder Awareness Programs Improved Inter-Institutional Coordination Training for Service Providers
	Addressing Root Causes	Promoting Ethics & Discipline Controlling Drug Use
	Infrastructure & Security Measures	Improved Lighting & CCTV Tourist Police Mobile Service

Table V: Theme 3 - Strategies for Mitigation & Prevention

Findings indicate that effective prevention requires a combination of transparency, enforcement, collaboration, and structural improvements. Five interconnected focus codes emerged: enhanced transparency and information, stronger enforcement and accountability, collaborative stakeholder engagement, addressing root causes, and infrastructure and security measures. Enhanced transparency and information were widely emphasized as preventive mechanisms. Stakeholders highlighted the need for clear pricing guidelines, standardized transport fares, and visible price displays to reduce overcharging and financial disputes. Accessible tourist information points, including safety guidance and emergency contacts, were identified as essential for empowering tourists. Cultural

awareness initiatives were also recommended to reduce misunderstandings related to dress, behavior, and local norms.

Additionally, the development of digital information systems or mobile applications was proposed to provide verified service listings, transparent pricing, safety alerts, and simplified reporting mechanisms. Stronger enforcement and accountability emerged as a critical deterrent to harassment. Respondents stressed the importance of increased police presence and visibility in high-traffic tourist areas to enhance surveillance and immediate intervention. Strict legal action and consistent punishment for offenders were identified as necessary to establish deterrence and restore tourist confidence. Mandatory licensing and registration of guides, drivers, and service providers were also emphasized to improve professionalism, traceability, and accountability within the tourism sector.

Collaborative stakeholder engagement was identified as essential for sustainable prevention. Stakeholder awareness programs targeting local communities and tourism workers were recommended to highlight the economic and reputational consequences of harassment. Improved inter-institutional coordination among police, tourism authorities, and local councils was emphasized to ensure efficient complaint handling and consistent enforcement. Training programs for service providers focusing on ethics, hospitality standards, communication skills, and cultural sensitivity were also highlighted as key capacity-building measures. Addressing root causes focused on promoting ethics and discipline and controlling substance abuse in tourist areas. Stakeholders linked unethical behavior and weak disciplinary action to recurring harassment incidents and emphasized the need for moral education and enforcement. Drug use among informal operators was identified as a contributing risk factor requiring targeted control measures. Infrastructure and security measures such as improved lighting, CCTV coverage, and mobile tourist police services were highlighted as practical interventions to enhance visibility, rapid response, and overall tourist safety.

### **Perpetrators, Vulnerable Environments & Victim Characteristics**

This theme examines the interrelated roles of perpetrators, spatial contexts, and tourist characteristics in shaping harassment experiences faced by foreign tourists. By integrating stakeholder perspectives on who engages in harassment, where it most commonly occurs, and which tourists are most vulnerable, this section provides a structured understanding of risk patterns that influence both the occurrence of harassment and tourists' subsequent responses.

<b>Theme</b>	<b>Focus Code</b>	<b>Open Code</b>
Perpetrators, Vulnerable Environments & Victim Characteristics	Perpetrator Profiles	Informal/Unlicensed Service Providers Unemployed/ Drug-Addicted Individuals
	Vulnerable Locations & Settings	Public Commercial Areas Isolated Places, Hotels Areas Lacking Police Presence Nighttime/ Less Supervised Areas
	Victim Vulnerabilities	Solo Female Travelers Independent Travelers Lack of Cultural Awareness

Table VI : Theme 4 - Perpetrators, Vulnerable Environments & Victim Characteristics

Stakeholders consistently identified informal and unlicensed service providers including uncertified guides, three-wheeler drivers, and street vendors as primary perpetrators. Their operation outside regulated systems limit accountability and enable persistent solicitation, overcharging, and deceptive practices. Respondents noted that the majority of formal complaints involve such operators, while observations confirmed repeated pressure on tourists and inflated pricing despite clear refusals. The lack of registration and monitoring mechanisms was repeatedly linked to weak deterrence and difficulty in addressing misconduct. In addition, unemployed and drug-affected individuals were associated with

aggressive and unpredictable behavior toward tourists. Stakeholders connected harassment in public spaces to broader socioeconomic challenges, suggesting that unemployment and substance abuse contribute to opportunistic and hostile conduct in tourist areas. The analysis further highlights vulnerable locations and settings where harassment is more prevalent. Public commercial areas, such as markets and souvenir zones, were identified as hotspots due to high tourist concentration, constant transactional interactions, and limited regulation.

Tourists frequently reported feeling pressured by repeated approaches, while observations documented aggressive sales tactics. Isolated places, including poorly lit or sparsely populated paths, were perceived as particularly risky, as the absence of witnesses and supervision emboldens perpetrators. Hotels, despite their reputation for safety, also emerged as vulnerable settings, with reported incidents involving staff misconduct, unwanted attention from other guests, and inadequate access control. Additionally, areas lacking visible police presence and less supervised environments at nighttime were consistently linked to heightened harassment, with reduced surveillance increasing both actual risk and tourists' feelings of vulnerability. Victim vulnerabilities were shaped by gender, travel style, and cultural awareness. Solo female travelers were identified as the most at-risk group, with stakeholders reporting a disproportionate number of harassment cases involving women, particularly in isolated or nighttime settings. Independent travelers, including backpackers and budget tourists, were also highly vulnerable due to their reliance on public transport, informal services, and street-level interactions. A lack of cultural awareness further increased susceptibility, as unfamiliarity with local norms, dress expectations, and social cues limited tourists' ability to disengage from unwanted interactions. The findings demonstrate that tourist harassment arises from the interaction between unregulated perpetrators, high-risk environments, and specific tourist vulnerabilities, underscoring the need for targeted, context-sensitive interventions.

## **Discussion**

The discussion interprets the findings by explaining why harassment

occurs, how tourists cognitively and emotionally respond, and so what these outcomes mean for destination reputation, governance, and sustainable tourism development. From the perspective of Cognitive Appraisal Theory (Lazarus & Folkman, 1984), tourist harassment functions as a significant psychological stressor that challenges visitors' perceptions of safety, autonomy, and control. The study revealed that tourists appraise harassment not merely as isolated inconveniences but as violations of expected host–guest norms. Financial deception, intrusive solicitation, sexual harassment, and property-related incidents were cognitively evaluated as threats, triggering emotional responses such as fear, anger, frustration, and helplessness. These emotional reactions subsequently shaped coping behaviors, including avoidance, withdrawal from public spaces, restricted mobility, and disengagement from local interactions. Importantly, the findings extend CAT by demonstrating that tourists' coping strategies are shaped not only by the severity of harassment but also by their appraisal of institutional responsiveness. Many tourists avoided reporting incidents due to low confidence in enforcement mechanisms, perceiving authorities as ineffective or inaccessible. This perceived lack of institutional support intensified feelings of vulnerability and encouraged passive coping strategies, such as silence or early departure. Thus, harassment in Sri Lanka operates as both a personal stressor and an institutional trust issue, reinforcing CAT's relevance in tourism safety research. Destination Image Theory provides a broader interpretive layer by explaining how these individual stress appraisals accumulate into collective reputational damage. Recurrent experiences of overcharging, verbal harassment, sexual misconduct, and theft contributed to the formation of a negative cognitive image of Sri Lanka as unsafe, poorly regulated, and exploitative. These findings support Kozak (2007) and Alrawadieh et al. (2019), who argue that negative micro-experiences can override large-scale branding efforts. The affective dimension of destination image was particularly eroded among female and independent travelers, for whom fear and discomfort replaced anticipated enjoyment. The role of user-generated content further amplifies this process. As Shen, et al. (2015) note, tourists increasingly rely on peer reviews rather than official promotions. This study

confirms that harassment narratives shared on social media and travel platforms significantly influence destination choice, revisit intention, and recommendation behavior. Even when incidents were described as “minor,” their frequency and visibility transformed them into powerful deterrents, illustrating how destination image degradation occurs incrementally rather than through singular crises. Through Stakeholder Theory (Freeman, 1984), harassment emerges as a symptom of systemic governance failures rather than individual misconduct alone. The dominance of informal and unlicensed service providers as perpetrators reflects weak regulation, fragmented oversight, and limited stakeholder coordination. These findings align with Jayasinghe and Ratnayake (2018) and Wijesundara and Gnanapala (2020), who emphasize that gaps between tourism authorities, police, local government, and community actors enable unethical behavior to persist. The study further reveals that even formal stakeholders such as hotel staff and licensed guides can become sources of harassment when accountability and monitoring mechanisms are weak, challenging the assumption that professionalism guarantees ethical conduct.

The findings strongly confirm existing international and local literature identifying tourist harassment as multidimensional. Consistent with De Albuquerque and McElroy (2001) and Kozak (2007), financial exploitation through overpricing and scams remains a dominant form of harassment. Similar to Wijesundara and Gnanapala (2020) and Arachchi (2020), this study found persistent verbal harassment and aggressive solicitation by informal operators in high-traffic tourist zones. Sexual harassment findings align with Boakye (2010) and Calafat et al. (2013) who documented disproportionate targeting of female tourists. However, this study extends prior research by identifying harassment within hotels, spas, and guided services spaces traditionally perceived as safe. This contradicts earlier Sri Lankan studies that largely confined harassment to beaches and informal public spaces, indicating a deeper institutional vulnerability. Property-related harassment and theft further corroborate De Albuquerque and McElroy (2001), yet the involvement of authorized intermediaries in some cases represents a novel contribution. This challenges the assumption that structured

tourism environments inherently reduce risk and highlights erosion of trust even within regulated systems.

<b>Theme</b>	<b>Findings from Study</b>	<b>Supporting Literature</b>	<b>New Insights from Study</b>
Harassments	Overcharging, persistent solicitation, sexual harassment, theft including by guides	Kozak (2007); Arachchi (2020); Wijesundara & Gnanapala (2020)	Theft by trusted guides; harassment inside hotels by staff
Tourist Experiences & Impact	Emotional distress, behavioral avoidance, low formal reporting, negative destination image	Kozak (2007); Alrawadieh et al. (2019)	Visible tourist frustration; strong influence of online reviews
Strategies for Mitigation	Need for cultural awareness, stronger enforcement, stakeholder coordination, addressing root causes, improved infrastructure	Senewirathne (2012); Arachchi (2020); Boakye (2010)	Emphasis on public penalties, drug addiction linked to harassment
Perpetrators & Vulnerabilities	Unlicensed operators, drug-addicted individuals, vulnerable locations including hotels, solo female and independent travelers most at risk	Wijesundara & Gnanapala (2020); Kozak (2007); Calafat et al. (2013)	Drug addiction as a key driver; hotels as unexpectedly risky

Table VII : Literature Discussion Summary

One of the most significant and unexpected findings was that formal tourism environments are not immune to harassment. Contrary to dominant assumptions, licensed guides and hotel staff were occasionally implicated in

misconduct. This contradicts earlier literature that framed informal actors as the primary risk group and suggests that ethical lapses are not limited to marginal actors but may occur across the tourism hierarchy. Another contradiction emerged in tourists' responses to harassment. While CAT predicts active coping when resources are available, many tourists chose silence despite clear distress. This indicates that perceived institutional inefficiency overrides personal agency, resulting in disengagement rather than confrontation or reporting. This finding highlights a disconnect between theoretical expectations of coping and the realities of tourism governance in developing destinations.

This study contributes meaningfully to all three theoretical frameworks. It extends Cognitive Appraisal Theory by demonstrating that tourists appraise harassment as a breach of hospitality trust rather than merely physical or financial harm. The findings also reveal that appraisals of institutional failure significantly shape emotional outcomes and coping behavior, suggesting the need to integrate governance perception into CAT applications in tourism. The study advances Destination Image Theory by illustrating how repeated low-intensity negative encounters cumulatively undermine destination branding. It emphasizes the growing dominance of user-generated content in shaping global image, reinforcing arguments by Alrawadieh et al. (2019) that destination reputation is now co-produced by tourists rather than controlled by authorities. The research refines Stakeholder Theory by positioning informal tourism actors as powerful yet neglected stakeholders whose actions disproportionately affect destination credibility. It also identifies tourists themselves as active stakeholders who enforce accountability through digital platforms when formal systems fail.

Practically, the findings underscore that harassment prevention cannot rely solely on policing. Instead, it requires integrated strategies combining licensing reforms, ethical training, community education, visible enforcement, and digital reporting systems. Consistent with Arachchi (2020) and Wijesundara and Gnanapala (2020), improving stakeholder coordination particularly between SLTDA, Tourist Police, and local authorities is essential. Formalizing informal actors, introducing mandatory codes of conduct, and strengthening hotel

accountability mechanisms are critical steps toward restoring trust.

Despite its contributions, the study has limitations. The qualitative design limits generalizability, and findings reflect stakeholder perceptions rather than direct victim narratives. The geographic focus on selected tourism hubs may exclude experiences from less-visited regions. Additionally, social desirability bias and sensitivity surrounding harassment topics may have constrained full disclosure. Future research should incorporate mixed methods, longitudinal designs, and direct tourist interviews to strengthen empirical depth. This study demonstrates that tourist harassment in Sri Lanka is a psychologically distressing, reputationally damaging, and institutionally embedded phenomenon. Addressing it requires recognizing harassment not as isolated misconduct but as a governance and destination image crisis that demands coordinated, theory-informed intervention.

### **Conclusion and Recommendations**

Harassment of foreign tourists has emerged as a critical challenge for Sri Lanka's Cultural Triangle, encompassing the heritage cities of Kandy, Polonnaruwa, Sigiriya, Dambulla, and Anuradhapura. These destinations form the core of Sri Lanka's cultural tourism identity, yet the research revealed that harassment is a persistent and multidimensional issue, threatening both visitor safety and the reputation of the region. Harassment manifested in various forms, including verbal abuse, persistent solicitation, sexual advances, overpricing, unwanted physical proximity, and even drug-related approaches. Incidents were frequently observed in public spaces, transport hubs, and sacred sites, areas that should reflect hospitality and cultural pride but often become sources of discomfort, particularly for solo and female travelers.

Applying Cognitive Appraisal Theory, the study found that tourists emotionally processed these encounters as psychological threats, resulting in fear, anxiety, anger, and embarrassment. These emotional responses often led tourists to adopt avoidance behaviors, such as limiting exploration of public spaces, cutting short visits, or restricting interactions with locals. Such behaviors not only

reduced cultural engagement but also diminished the local economic benefits derived from tourism. In addition, Destination Image Theory highlighted the broader reputational consequences of harassment. While Sri Lanka promotes the Cultural Triangle as a cradle of ancient civilization and spiritual heritage, repeated negative experiences create a gap between tourist expectations and reality. This gap, amplified by social media, blogs, and online reviews, contributes to emotional disappointment and long-term reputational damage, with the betrayal felt in sacred environments having a particularly strong impact on visitor perceptions. Stakeholder Theory further revealed that institutional responses to harassment were largely fragmented and reactive. Although the Sri Lanka Tourism Development Authority, Tourist Police, local councils, and private actors are involved in tourism governance, coordination is weak and resources are insufficient. Frontline staff, including informal guides and tuk-tuk drivers, often operate without proper training in ethics, customer service, or hospitality, further perpetuating unsafe and uncomfortable situations.

The study also highlighted gendered and cultural vulnerabilities, with solo female and Western tourists being particularly at risk. Harassment in sacred or culturally significant spaces, coupled with institutional insensitivity and societal silence on gender norms, reinforces a culture of impunity. Media representation plays a critical role in shaping perceptions, as viral posts and videos of harassment incidents often overshadow official tourism promotions, contributing to an unfiltered and sometimes negative portrayal of the destination. Collectively, these findings underscore that harassment is not merely an individual safety issue but a structural problem affecting destination authenticity, visitor satisfaction, and the long-term sustainability of Sri Lanka's tourism industry. If left unaddressed, such incidents threaten to undermine the country's cultural integrity and its global tourism potential.

Addressing this issue requires a holistic and coordinated approach among all stakeholders in the tourism ecosystem. Promoting cultural sensitization through community workshops and tourist orientation materials can foster respectful interactions between hosts and visitors. Strengthening complaint and

reporting mechanisms, including multilingual hotlines, mobile applications, and visible complaint counters, ensures that tourists can report incidents safely and receive timely feedback. Standardizing pricing, increasing transparency, and implementing ethics and communication training for licensed and informal tourism personnel are crucial to reducing exploitation and harassment. Enhancing the visibility of Tourist Police, deploying gender-balanced patrols, and providing regular sensitivity training are key measures to deter harassment. Technology-based safety solutions, such as official tourism safety apps and incident response dashboards, can facilitate real-time reporting and coordination among authorities. Coordination between government agencies, local councils, hotels, and community representatives should be institutionalized through district-level tourism safety committees, with clear accountability and monitoring mechanisms. National awareness campaigns can educate the public on the social and economic impacts of harassment, fostering a culture of respect. Legal reforms, including tourism-specific legislation defining harassment and enforcement powers, alongside fast-track judicial processes, can strengthen institutional response. Finally, empowering local communities through vocational training, alternative livelihoods, and inclusion in safety monitoring addresses socio-economic factors that contribute to harassment.

Future research could extend these findings by examining harassment in other regions of Sri Lanka, employing mixed-method approaches for broader generalizability, and investigating the experiences of specific tourist demographics such as families or LGBTQ+ travelers. Studies focusing on perpetrators' motivations and evaluating the effectiveness of interventions, including increased policing, awareness campaigns, and community programs, would further inform policy and practice. Longitudinal research tracking harassment trends and their impact on destination image and tourist loyalty would provide additional insights critical for sustainable tourism development. By implementing these recommendations, Sri Lanka can strengthen visitor safety, preserve its cultural heritage, and enhance its global reputation as a responsible and welcoming destination.

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## **FinTech, Inclusion and the Digital Shift: Reflections from a National Dialogue in Eastern India.**

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**“Fintech is the intersection of technology, finance, and customer-centricity.”**  
**- Nuno Sebastiao-**

### **Abstract**

Financial Technology-better known as FinTech- has not arrived with noise or spectacle. Instead, it has steadily and decisively reshaped how money moves, how decisions are taken, and how trust is built within financial systems. What began as technology supporting traditional banks has today evolved into a dynamic ecosystem of digital platforms, mobile applications, data-driven tools and AI-powered services that place finance directly in the hands of individuals, enterprises and communities.

At a surface level, fintech allows people to transfer money, pay bills, access credit, invest, insure assets and plan for the future: all digitally. But beneath this convenience lies a deeper structural shift. Fintech is redistributing access, compressing time, and redefining participation in the economy. As financial services move away from physical branches and rigid processes, geography, infrastructure gaps and conventional gatekeeping are losing their power.

This quiet transformation set the stage for why fintech was not merely innovative, but inevitable. This paper addresses the importance and the viability of FinTech in Financial Power Economy and how benefits can be/ delivered to the maximize the efficiency with the focus on South Asia, with a special reference to Sri Lanka.

**Keywords:** Fin Tech, AI powered Fintech, e-economy

## **Why FinTech Became Inevitable**

The rise of fintech is inseparable from the rise of smartphones and widespread internet access. As transport, education, healthcare and communication became digital-first, finance could not remain confined to physical branches, limited working hours and paper-heavy systems.

Banks initially adopted technology cautiously by digitizing internal processes and enabling basic online services. But innovation quickly outpaced incremental reform. Today, fully digital banks operate without a single physical branch, offering seamless, app-based services built around user experience.

More importantly, fintech emerged as a direct response to long-standing inefficiencies:

- Prolonged loan approval cycles
- High transaction costs
- Limited access for rural and informal populations
- Rigid legacy infrastructure

By leveraging APIs, cloud computing, mobile platforms and advanced analytics, fintech bypassed these barriers and reimaged financial delivery from the ground up.

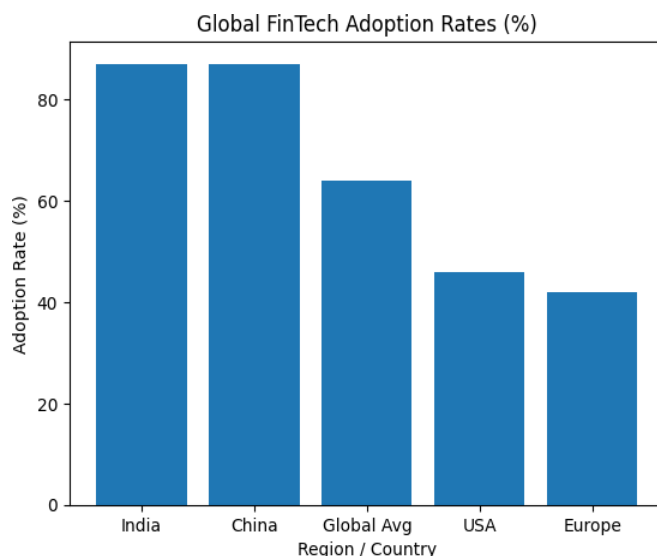
## **FinTech and the Global Shift in Economic Behaviour**

A comparison of global fintech adoption patterns reveals a significant departure from traditional economic hierarchies.

The chart on **global fintech adoption rates** clearly illustrates this transformation. India and China lead the world with adoption rates close to 87 percent, well above the global average of around 64 percent. In contrast, developed economies such as the United States and Europe show adoption levels between 40 and 46 percent.

This inversion of expectations is economically significant. Emerging economies, rather than following legacy financial pathways, have leapfrogged into digital finance ecosystems. This has reduced transaction costs, improved liquidity circulation and accelerated domestic consumption—key drivers of GDP growth.

In India’s case, fintech has aligned closely with national economic priorities: formalisation of the economy, expansion of the tax base, and inclusion of informal sectors into structured financial systems.



### **FinTech as a Tool for Inclusion**

Fintech’s most profound impact is not technological—it is social and economic inclusion. Digital wallets, app-based lending and mobile banking have extended financial access to individuals and enterprises historically excluded from formal systems.

Key shifts include:

- Digital payments reducing cash dependency
- Alternative credit models serving first-time borrowers
- Micro-investment platforms enabling participation with minimal capital

- AI-driven credit assessment reducing bias and improving accuracy

Digital lending alone is growing at a compound annual growth rate exceeding 16%, reflecting a clear demand for faster, transparent and paperless credit solutions.

In practical terms, inclusion through fintech directly influences employment generation, consumption capacity and local economic development.

As financial inclusion deepens through fintech, its effects begin to scale beyond individual users and enterprises. Once transactions, credit, and savings move into digital channels, inclusion translates into measurable economic activity—shaping consumption, liquidity, and formal market participation. It is through this shift, particularly via digital payments, that fintech’s social impact evolves into macroeconomic momentum.

### **Digital Payments and GDP Momentum**

India’s digital payments ecosystem has expanded at exceptional speed, with annual transaction volumes increasing from under 10 billion in 2018 to over 130 billion transactions by 2024, driven primarily by the widespread adoption of UPI. This growth reflects a fundamental shift in payment behaviour across consumers, businesses, and institutions, positioning digital payments as a core economic enabler rather than a supplementary tool.

At the macroeconomic level, high-frequency, low-cost digital transactions have improved the velocity of money, reduced settlement delays, and lowered transaction costs across sectors. Faster circulation of funds supports consumption, trade, and services activity, contributing

positively to GDP growth. For small and micro-enterprises, digital payments have reduced cash dependency while generating verifiable transaction histories, improving access to formal credit and strengthening financial inclusion.

The expansion of digital payments has also enhanced economic transparency. Reduced reliance on cash has improved traceability of transactions, supported higher tax compliance, and limited revenue leakages, strengthening public finance outcomes. These structural improvements contribute to long-term fiscal stability and enable higher-quality public investment.

Increasingly, economists view digital payment systems as essential economic infrastructure. Their scale and reliability now underpin everyday economic activity, supporting productivity, formalisation, and sustained growth. In this context, fintech-led payment platforms have become integral to India's GDP momentum and broader economic resilience. These macroeconomic gains are not accidental; they are rooted in deeper structural changes enabled by fintech. Beyond accelerating transactions, fintech is reshaping how credit is assessed, how financial institutions operate, and how inclusion is embedded into the economic system itself

### **FinTech, Inclusion and Structural Change**

One of fintech's most transformative roles lies in financial inclusion. Digital lending platforms, AI-based credit scoring and app-driven banking have opened access to credit for individuals and enterprises historically excluded from formal finance. This has direct consequences for employment, consumption and local economic development.

Digital lending, growing at an annual rate exceeding 16 percent globally, demonstrates how fintech substitutes paperwork-heavy processes with real-time decision-making. Combined with AI, fintech now enables personalised financial services on a scale: something traditional banking models struggled to achieve.

At the same time, fintech has allowed financial institutions to operate continuously. AI-powered chatbots, automated compliance systems and real-time fraud detection have reduced operational costs while increasing service availability, an efficiency gain with clear economic value.

As fintech reshapes financial access and institutional operations, the scale and speed of this transformation introduce new systemic risks. Managing these risks becomes essential not only for consumer protection, but for preserving financial stability and sustaining long-term economic gains

### **Governance, Regulation and Economic Stability**

However, fintech's economic promise cannot be realised without robust governance. As financial systems digitise, risks associated with data privacy, cybersecurity and systemic stability increase. Regulatory frameworks worldwide are evolving to balance innovation with protection.

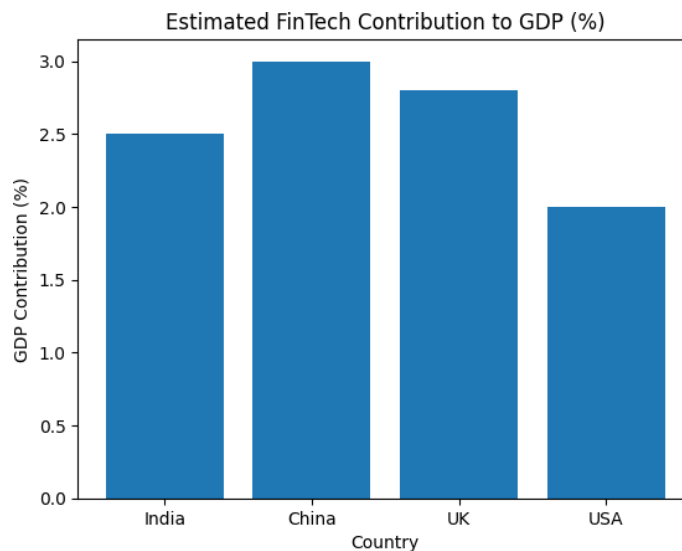
This balance is especially critical in economies experiencing rapid fintech expansion. Sound regulation ensures trust, which in turn sustains adoption and long-term economic benefit.

When regulatory frameworks succeed in balancing innovation with stability, fintech's economic effects become visible at the national level. Trust, scale, and institutional integration allow fintech to move from

isolated solutions to a measurable contributor to economic output.

### **FinTech's Contribution to National Economies**

Fintech's role in GDP is not abstract. This chart compares estimated fintech contribution to GDP across major economies. In India, fintech-driven activities account for an estimated 2.5 percent of GDP, with China slightly higher. The UK, despite its mature financial sector, also demonstrates strong fintech integration, while the US reflects a more gradual transition due to entrenched legacy systems.



These figures are significant because fintech's contribution extends beyond direct revenue. It enhances productivity, enables new business models, improves financial resilience, and supports entrepreneurship. In effect, fintech acts as a multiplier, amplifying the efficiency of existing economic structures.

As fintech's contribution to national economies becomes

increasingly measurable, the role of policy dialogue and institutional convening grows in importance. Translating fintech’s economic potential into inclusive, regionally balanced growth requires platforms that connect regulation, industry innovation and public policy—particularly in emerging and underserved regions.

### **SAIARD’s FinTech Symposium: A Regional Economic Intervention**

It is within this broader economic and global context that the South Asian Institute for Advanced Research and Development (SAIARD) hosted the National Symposium on FinTech 2026 in Kolkata. For over eight years, SAIARD has functioned as a non-profit policy advocacy think tank working across sectors, focusing on research- driven dialogue and institutional engagement. This Symposium in Kolkata, marked a significant regional economic intervention, engaging regulators, policymakers, banking leaders, and industry innovators from Eastern and North-Eastern India. (Figure.01) .



**Fig.01:** Fintech Symposium hosted by South Asian Institute for Advanced Research and Development (SAIARD)

The event featured prominent figures, including government leadership and representatives from financial institutions, emphasizing

policy and governance. Notable discussions included skill development, employment, and fintech's role in economic growth. The symposium shifted the dialogue towards practical outcomes and governance readiness, aiming to develop frameworks based on the socio-economic context of the region, emphasizing real discussions over buzzwords.

### **The Power of Convergence: The Symposium Truly Stood Apart ?**

What distinguished the SAIARD National Symposium on FinTech 2026 was its exceptional scale and the diverse array of participants gathered. Senior policymakers, regulators, banking leaders, national digital payment authorities, multilateral institutions, law enforcement, academia, infrastructure agencies, and fintech innovators from Eastern India convened, facilitating rich discussions grounded in regulatory and operational insights. Key attendees included officials from the Reserve Bank of India and National Payments Corporation of India, along with public sector and rural bank leaders. The involvement of multilateral advisory bodies and fintech innovators illustrated the translation of policy visions into practical solutions. Additionally, academic contributions and representation from cybersecurity, law enforcement, and public infrastructure highlighted the expanding role of fintech beyond banking into governance, urban management, mobility, welfare, and national infrastructure. This convergence of perspectives transformed the symposium from a conventional conference into a living policy ecosystem—where regulation, innovation, implementation and impact were discussed together, not in isolation.

### **Why Convergence Matters for Eastern and North- Eastern India !**

For Eastern and North-Eastern India, a symposium highlighted the importance of these regions in national fintech and policy discussions, despite their underrepresentation. It outlined strategies for improving digital payments and credit access in rural areas, empowering local businesses and workers, enhancing regional banks' resilience, and ensuring transparent financial delivery systems. The dialogue emphasized the regions' roles as active participants in creating fintech solutions tailored to their unique contexts.

### **National Value and Governance Impact**

At the national level, the symposium demonstrated the value of decentralized policy dialogue. Insights emerging from regions with diverse economic structures strengthen national frameworks in digital payments, AI governance, cybersecurity and inclusive finance.

For governments, such platforms align regulatory intent with on-ground feasibility. For financial institutions, they provide clarity on policy direction and innovation priorities. For citizens, they translate into systems that are more accessible, transparent and trustworthy. In this sense, the symposium functioned as a policy feedback loop: bridging central vision with regional execution.

### **Why This Matters Going Forward !**

Fintech is no longer optional. It is foundational to digital economies, inclusive growth, efficient governance and global competitiveness. By hosting this symposium, SAIARD demonstrated that thought leadership does not need to be geographically centralised. Eastern and North-Eastern India are not merely adopters of fintech, but they are

contributors to its future. Fintech today is not a supporting actor in economic growth; it is central to it.

What the SAIARD symposium reinforced is a simple truth: sustainable economic transformation requires inclusive platforms, informed policy dialogue and regionally grounded leadership. The SAIARD National Symposium on FinTech 2026 reaffirmed a fundamental truth: sustainable digital transformation cannot be built in silos or confined to a handful of geographies. It requires inclusive platforms, informed leadership and sustained dialogue between those who frame policy, those who build systems and those whose lives are shaped by them.

By convening such a diverse and authoritative group of stakeholders in Eastern India, SAIARD demonstrated that meaningful national conversations can and must emerge from the regions. The symposium did not merely discuss the future of fintech; it illustrated how regionally grounded, collaborative leadership can actively shape that future.

As India advances toward a digitally empowered economy, platforms like this will play a defining role, ensuring that growth is inclusive, governance is responsive, and innovation serves both national ambition and local realities. Fintech, when guided by policy, trust and purpose, does not merely digitize financial redefines the economy itself.

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## **Virtual Reality as an Applied Safeguarding Tool for Sri Lankan Traditional Music Heritage**

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### **Abstract**

In Sri Lanka, traditional musical practices embedded in agricultural, ritual, and occupational contexts are rapidly declining due to modernization, generational discontinuity, and the erosion of performance environments. Existing safeguarding initiatives largely emphasize documentation and archiving, often failing to engage younger generations or to communicate the experiential and contextual dimensions of musical traditions. Addressing this gap, this study explores how emerging technologies particularly Virtual Reality (VR) can be effectively integrated into efforts to sustain and promote Sri Lankan traditional music heritage. Grounded in applied ethnomusicology and UNESCO's safeguarding principles, the research combines ethnographic fieldwork, archival research, and digital application development. Audio recordings from early ethnomusicologists such as Arnold Bake, W. B. Makulloluwa, and C. de S. Kulatillake, alongside contemporary field recordings, informed the creation of a multi-domain VR application. The application focuses on endangered musical forms including bullock-cart songs, boatman songs, Kamath gee, and watch hut songs, reconstructing their original cultural and environmental contexts through immersive 3D environments. Developed using Agile methodology, Unity, and Blender, the application was piloted with university students to evaluate usability, engagement, and learning outcomes. The findings demonstrate that VR offers a powerful tool for safeguarding by enabling participatory, multisensory, and context-rich

encounters with traditional music. Rather than functioning solely as an archival medium, the VR application supports social sustainability, intergenerational transmission, and cultural agency. The study argues that safeguarding must move beyond preservation toward experiential and community-centered models that recognize traditional music as a living and evolving practice within contemporary Sri Lankan society.

**Keywords:** Applied Ethnomusicology, Digital Preservation, Safeguarding Intangible Cultural Heritage, Traditional Music Heritage, Virtual Reality (VR)

## **Introduction**

Music reflects human creativity and cultural diversity as an integral element of the Intangible Cultural Heritage (ICH). Traditional music serves as a medium for storytelling, historical preservation and community bonding worldwide. According to the United Nations Educational, Scientific, and Cultural Organization's (UNESCO) 2003 Convention, ICH refers to "the oral traditions and expressions, performing arts, social practices, rituals and festive events, knowledge and practices concerning nature and the universe" that are transmitted across generations (UNESCO, 2023a, p.6). The list of UNESCO's ICH has grown to include new inscriptions since 2008. The UNESCO ICH inscribed element list includes 788 elements representing 150 countries across five regions (UNESCO, 2023b). The terms music and song appear in 304 of the 584 entries on the list (52%), referring to music alone or in combination with other qualities such as dance and poetry (De-Miguel-Molina et al., 2021).

<b>ICH Item</b>	<b>Category</b>	<b>Inscribed Year in the List</b>	<b>Country</b>	<b>Related Sustainable Development Goals (SDG)</b>
Wosana ritual and associated practices	Rainmaking Ritual	2024	Botswana	2, 3, 5, 16
Mangwenge traditional dance	The performance involves a lead singer or dancer, supporting singers and dancers, hand clappers, and musicians.	2024	Zambia	4, 5, 8, 16
Sevdalinka, a traditional urban folk song	Form of traditional urban singing	2024	Bosnia and Herzegovina	3, 4, 5, 8, 16
Mek Mulung	Traditional Malaysian performance involving acting, dialogue, singing, and dancing	2023	Malaysia	4, 16
Bolero:	Latin	2023	Cuba and	4, 5, 16, 17

identity, emotion, and poetry turned into song	American sentimental song		Mexico	
Hiragasy	The performing arts comprise of songs, dances, and speeches.	2023	Madagascar	4, 5, 16
Malhun	A popular form of poetic expression	2023	Morocco	4, 5, 16
Sadeh/Sada celebration	Seasonal festival involves singing, dancing, and praying around a fire and offering blessings	2023	Iran and Tajikistan	2, 16, 17
Rai	Popular folk song	2022	Algeria	5, 8, 10, 16
Dutar making craftsmanship and traditional music performing	Turkmen music and singing	2021	Turkmenistan	4, 5, 12, 16

arts combined with singing				
Inuit drum dancing and singing		2021		4, 16, 17

Table 1: Examples of Musical Heritage on the UNESCO List

Source: <https://ich.unesco.org/en/lists>

Traditional music plays a universally recognized role in fostering identity, belonging, and continuity within communities. Furthermore, it is a deeply ingrained element of cultural expression in most countries, especially China. It also serves as a cornerstone for defining and maintaining cultural identity and connecting individuals to their roots in the community. Traditional music conveys cultural values, collective histories, and shared experiences through its melodies, rhythms, and lyrics. After analyzing the table of UNESCO-listed musical heritage samples, it is interesting to note that traditional songs in many countries serve as vehicles for moral lessons, historical events, and for conveying collective wisdom. It has also been incorporated into unofficially documented narratives. For example, ritual music strengthens bonds during social and religious ceremonies. Lullabies and work songs have been used to teach children cultural norms and behaviors. This musical transmission strengthens the sense of belonging by fostering social and emotional ties within groups.

An interesting example is the Wosana ritual and practice in Botswana. Music plays an important role in Wosana rituals. It helps build a strong sense of community and belonging, bringing people together and strengthening their feelings of connection to each other and their culture. This communal tradition involves the participation of everyone in the community. It includes conventional leadership, practitioners (the Ntoga

family), a high priest, men, women, and children as part of the audience (UNESCO, 2023a). In the Wosana Ritual and Associated Practices, music plays an important role and is at the heart of this practice, binding participants together and strengthening collective cultural identities. Human emotions such as happiness, sadness, and anger are profoundly affected by music. Music plays a positive role in developing a sense of belonging and self-confidence (Berthelot, 2017). Furthermore, Berthelot (2017) emphasizes its capacity to strengthen communal ties and individual identity. The music of these rituals and the collective participation of the community highlight the indispensable role of traditional music in promoting social cohesion and cultural continuity in the community. Associated songs and dance practices are transmitted through observation, regular practice, and mentoring. In addition, the enactment of the element is an opportunity for practitioners to produce and share food. Traditional music is more than just the preservation of cultural identity. It brings people together to share their experience. For example, in some communities, farming depends on rain rather than irrigation systems. Consequently, music often serves as a binding element that promotes unity among community members. Traditional music not only helps maintain cultural heritage but also serves as a catalyst for unity and continuity across generations (Liu et al., 2024).

Zambia's Mangwengwe Dance was added to UNESCO's representative list of Intangible Cultural Heritage of Humanity in 2024 (UNESCO, 2023a). This dance form has been practiced by both men and women among the Mambwe and Namwanga people of Zambia, exemplifying the role of music and dance in fostering community identity and unity (UNESCO, 2023a). The performance involves a lead singer or dancer, supporting singers and dancers, hand clappers, and musicians.

Women and girls take on roles as dancers, singers, and instrument players, while some men join in to support them by dancing, singing, and clapping. The Mangwengwe Dance holds profound cultural and social significance and is performed at significant communal events such as weddings, funerals, and traditional ceremonies. Notably, it is the only dance performed at the funeral and burial of a chief, highlighting its deep connection to the community traditions. Men actively participate in these dances during the celebrations. Beyond its ceremonial functions, the dance also serves as a medium of communication during political gatherings, where participants compose songs to praise or critique political and civic leaders, effectively voicing community challenges and achievements in the process. Over time, the Mangwengwe Dance has evolved to encompass both historical and contemporary themes, reflecting the community's dynamic cultural landscape. By bringing people together in celebration or reflection, dance fosters a sense of belonging and shared identity, extending its unifying power to occasions such as welcoming or bidding farewell to visitors and guests.

Traditional music is a vibrant repository of cultural knowledge and values. It retains its core elements while adapting to changing circumstances (Liu et al., 2024). As a dynamic tradition, it connects past and present (Makulloluwa, 2000). Furthermore, it offers a sense of continuity, despite rapid social changes. This resilience in music encourages communities to preserve their identity while promoting unity, harmony, and solidarity in an increasingly interconnected world (Kulatillake, 1976). Considering the above facts, it is important to preserve traditional and folk music for future generations, as music is an integral aspect of human culture. UNESCO's (2003) convention states that cultural practices across the world are under serious threat from a range of local and

global forces, and the music of minority groups, Indigenous peoples, and other marginalized or minorities groups is particularly at risk.

The extinction of musical and other cultural expressions occurs due to technological advancements, cultural homogenization, rapid urbanization, detaching younger generations from music practices (decline in transmission), and the displacement of traditional musical instruments and performance practices with digital and synthetic alternatives. Furthermore, cultural practitioners often face financial hardships. It is difficult for them to sustain their livelihoods through traditional music alone. Consequently, they may abandon their practice altogether. Grant (2024) emphasized that the diminishing ability of people to engage in rich cultural and social experiences contributes significantly to the fading of musical expression. War, political unrest, and natural disasters have disrupted communities. Policy gaps and insufficient support for safeguarding initiatives further accelerate the decline in cultural expression. Most of these factors are interrelated.

Considering the above facts, it is important to preserve traditional music for future generations, as music is an integral part of human culture. Many countries are actively working to develop comprehensive applications to safeguard traditional music. A graded music examination application was developed to preserve traditional Malay music in Malaysia (Shah & Saidon, 2017). This application assists in improving the sustainability of traditional Malaysian music, specifically the Malay Gamelan. This application involves the consideration and mechanism needed to assess the musical achievements of musicians included in Malaysian traditional music. This application also involves viva voce components, which analyze music in terms of the background, instruments, repertoire, music style, understanding of the aesthetics of the specific genre,

and performance practice. A quantification method was developed to preserve and promote Chinese musical and cultural heritage on the Internet (Wang, 2021). This method examines the global popularity of Chinese music using purposive sampling and content analysis.

The percentage alteration across the number of views concerning time was calculated, and a sample t-test with a normal distribution of data was performed using the Shapiro-Wilk criterion. Wang's (2021) application for the preservation and promotion of China's musical cultural heritage suggests that Chinese musical heritage is popularized through the Internet and improved by new developments. Music Computer Technologies (MCT) are applied to preserve and transmit traditional music in the Far East of Russia and China (Alieva et al., 2019). Alieva et al. (2019) developed MCT application that understands the traditional musical folklore beneficial for saving the national musical culture, preservation, development, and popularizing traditional cultural heritage. Kan (2022) developed an application to maintain the sustainability of traditional music and the ecological environment.

Kan's (2022) method analyzes the characteristics of traditional music by limiting the weight of the lyrics and semantic information. Koukopoulos et al. (2016) implemented a web-based application to digitize, manage, and disseminate musical and cultural heritage. This web-based application is designed to safeguard Ionian Islands' folk music using an architecture with a digitization layer and an information system layer. The digitization layer imparts all mandatory digitization services and an information system layer that assists effective multimedia management and a digital dissemination environment, which is beneficial for enhancing the heritage of Greek Ionian music. Folklore is created by combining the life customs and thoughts of common people (Makulloluwa, 2000). It arises

from people's historical events, daily lives, and environment. Traditionally, it has been passed down orally from generation to generation. People have shared and preserved their collective heritage through storytelling, singing, and performances. Over time, each retelling may introduce variations, leading to rich diversity of expressions.

Sri Lanka's traditional music heritage is a living reflection of the island's identity, embedded in rituals, agriculture, and occupations. Songs such as *kamath gee*, *nelum gee*, *goyam gee* and *bethi gee* have shaped social and spiritual life for generations. However, due to modernization and changing cultural values, many traditions are vanishing, and younger generations have limited connection to these musical practices. Sri Lankan government and civil society has done a very poor job at preserving its rich traditional music heritage. The country did suffer from the civil war for several decades; the state of archiving in the country (and digitization) has lagged behind other countries for several reasons.

Despite growing recognition of the need to safeguard Sri Lanka's traditional music heritage, existing preservation efforts largely rely on documentation and archival methods that often fail to engage younger generations or convey the lived, performative contexts of musical traditions. This raises the research question: How can emerging technologies particularly Virtual Reality (VR) be effectively integrated into safeguarding strategies to sustain and promote Sri Lankan traditional music heritage in ways that are culturally grounded, participatory, and sustainable. The aim and objective of the study is to integrate innovative technologies, particularly Virtual Reality (VR), to sustain and promote Sri Lankan traditional music heritage. This involves researching Virtual Reality technologies, testing their applicability, and integrating them into preservation and promotion efforts.

## **Methodology**

This study used purposive sampling to select the music forms. VR application development focuses on four specific musical forms: bullock-cart songs, boatman songs, Kamath gee, and watch hut songs. This study focused on traditional songs that are rarely performed in contemporary environments, with the objective of safeguarding endangered musical forms. The criteria for selection were primarily based on,

- (1) the historical significance of the music forms within Sri Lankan culture,
- (2) their current level of practice and performance within traditional settings, and
- (3) the availability of practitioners or knowledge holders.

These criteria were operationalized by consulting with ethnomusicologists, reviewing archival records at the National Archives of Sri Lanka, and preliminary field interviews with cultural practitioners in rural areas. This approach ensured that the selected music forms represented a broad spectrum of Sri Lanka's musical heritage, while also prioritizing those at greatest risk of fading from cultural memory. The Agile development methodology was selected for its flexibility and iterative approach, allowing for continuous user feedback and rapid incorporation of changes into the VR application. This approach was deemed necessary due to the exploratory nature of developing an educational VR experience, where user feedback could lead to significant adjustments in content presentation and interaction design. Blender was used for custom 3D models due to its powerful modeling tools and compatibility with Unity.

## Results and Discussion

**Figure 1** and **2** illustrate the user interface for engaging with Karaththa Kavi, and **Figure 3** and **4** provide boatmen songs boat design stages within the VR environment, showcasing intuitive controls, spatial navigation cues, and embedded cultural annotations.

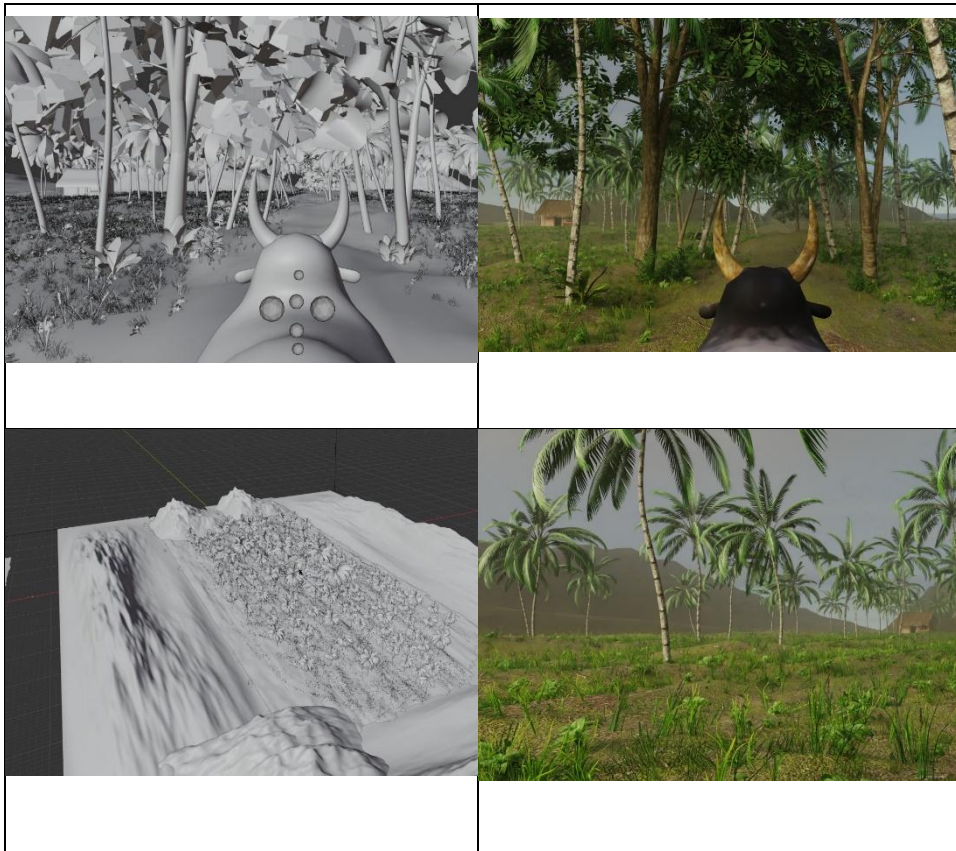
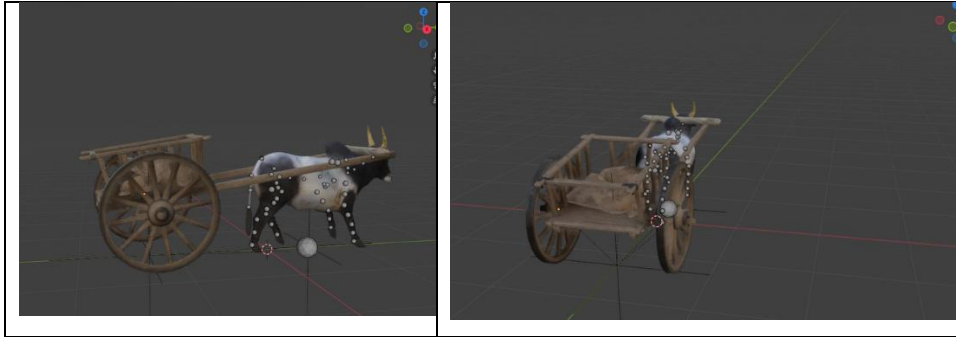
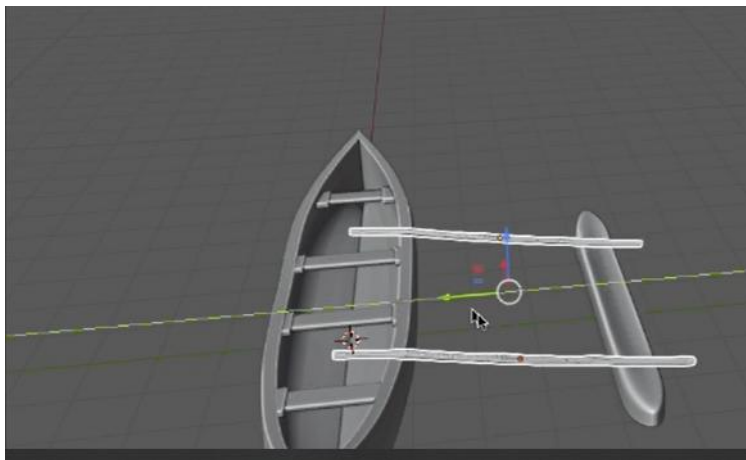


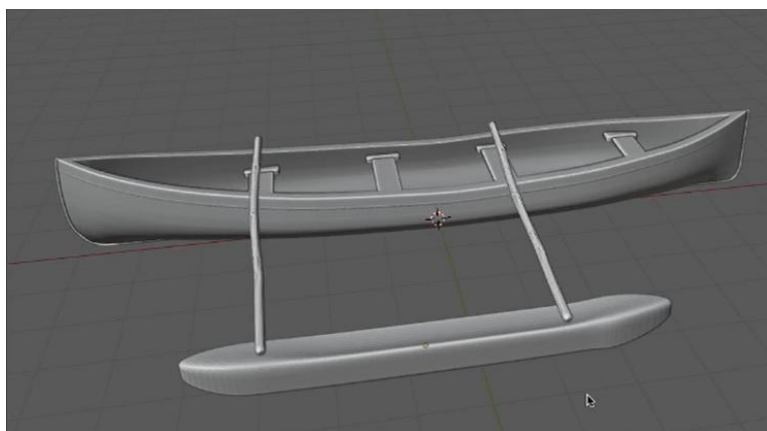
Fig.1:Developed interface for Karaththa kavi



**Fig. 2:**Bullock Cart Design Stages



**Fig. 3:**Boatmen Songs Boat Design Stages



**Fig. 4:**Boatmen Songs Boat Design Stages Another Angle

The initial development of the VR application was conducted with

students from the Department of Ethnomusicology at the University of the Visual & Performing Arts as a pilot study. This provided an academically grounded environment for preliminary testing and iterative refinement.

Traditional music is not just auditory; it's a multisensory experience that often involves specific cultural and environmental contexts. VR's immersive nature could be uniquely suited to replicating these aspects, allowing users not just to hear the music but to feel present in its original context. Zhao et al. (2025) stated the potential of Virtual Reality (VR) for a range of cultural heritage preservation applications. This technology has the “ability to create three-dimensional representations of real or imagined locations, provides a compelling sense of realism, illustrating its potential for various applications in cultural heritage preservation, such as 3D historical reconstruction, enhanced tourism engagement, gamified learning, and pedagogical cultural heritage programs” (Zhao et al., 2025, p. 1). VR's immersive capabilities surpass those of other digital technologies, such as 2D video or audio recordings, by providing a three-dimensional, interactive experience that more closely mimics attending a live performance. VR's interactivity differentiates it from other technologies in capturing the communal aspects of traditional music performances.

Traditional music often involves audience participation or a communal setting that is difficult to replicate through passive viewing or listening. VR's interactive potential allows users to not only observe but participate in these performances, perhaps by playing an instrument or following the movements of a dance, thus more fully capturing the communal spirit of these traditions. VR can engage multiple senses simultaneously, a feature that is particularly relevant for traditional music performances. For example, beyond auditory and visual stimuli, VR could potentially incorporate tactile feedback (through haptic technology) to

simulate the sensation of playing an instrument or the feeling of dancing.

This multisensory engagement is something that other digital technologies, which might only engage sight and sound, cannot fully provide. VR environments can be designed to include educational elements, such as textual information about the history and significance of the music, interviews with musicians, or scenes depicting the music's role in community events. This aspect of VR could be highlighted as a unique affordance, as it allows for a more enriched learning experience compared to simply listening to music or watching a performance. VR allows for the recreation of no longer accessible experiences, serves as a powerful tool for the preservation of intangible cultural heritage. This is especially crucial for traditions at risk of being lost over time. VR's ability to archive these experiences in an engaging and accessible manner could be argued as superior to traditional methods of preservation, which may not capture the full experiential richness of the cultural practices.

Sri Lanka's traditional music forms, such as bullock-cart songs, boatman's songs, and watch hut songs, have historically been integral to the nation's cultural identity. These musical expressions were not merely artistic performances but were deeply embedded in daily life, agriculture, and community activities. However, with rapid modernization, urbanization, and shifts in occupational structures, these traditions have witnessed a significant decline. The environments and contexts that once nurtured these musical forms have transformed or vanished, making live performances increasingly rare and documentation challenging in the present day. In this sense, the younger generation has limited exposure to traditional musical experiences. The absence of firsthand encounters and the scarcity of accessible video recordings have created a cultural disconnect, posing a risk to the continuity of this heritage in the future. To

fill this gap, innovative approaches are needed to preserve and revitalize these musical traditions. VR technology is an effective tool for achieving this purpose. VR can reconstruct the settings and environment in which traditional songs were originally performed by creating an immersive and interactive environment (Latta & Oberg, 1994). This technology facilitates the creation of interactive educational programs in which users can learn about the history, theory, and cultural significance of Sri Lankan traditional music through engaging simulations and virtual tutorials (Zhao et al., 2025). Users can virtually experience the ambiance of a watch hut in the paddy fields or the rhythmic journey of a bullock cart, accompanied by authentic musical renditions. This immersive approach preserves auditory elements and contextualizes them within cultural and environmental settings (Paolanti et al., 2023). Moreover, VR facilitates experimental learning (Crogman et al., 2025) and allows users, especially young people, to engage with cultural content in a manner that is both educational and emotionally resonant.

According to Multimedia Learning Theory, people learn more deeply from words and pictures than from words alone (Mayer, 2005). The VR application leverages this by providing rich visual and auditory stimuli to represent traditional music contexts. The Mayer's (2005) theory emphasizes the importance of reducing extraneous cognitive load. The VR environment can help focus attention on relevant stimuli by recreating authentic settings without distractions. The VR application integrates visual and auditory information in a cohesive 3D space, which may enhance learning compared to separate presentations. By presenting information through visual and auditory channels simultaneously, the VR experience may reduce cognitive load compared to text-heavy presentations.

According to Dandeniya's (2016) Temple Gateway and Transcultural Passage model, the VR environment functions as a virtual gateway through which users pass from their own cultural context into Sri Lanka's traditional music. When using a VR environment for traditional music in SL, if the user is unfamiliar with the music types, sounds, and environment, they may encounter a sense of disempowerment and disorientation. This is normal because they are in an unfamiliar cultural setting with unique practices. However, through the utilization of carefully constructed preorientation modules, interactive guides, and contextual narratives, the application fosters a progression that gradually enables users to transition from novice to informed observer and ultimately participate in the cultural performance (Dandeniya, 2016).

The pre-orientation module aligns with Multimedia Learning Theory's (Mayer, 2005) emphasis on providing prior knowledge to enhance learning from multimedia. It also addresses Technological Access Models (TAM)'s (Davis, 1989) focus on perceived usefulness by framing the experience's value. This theoretical lens underscores the importance of structuring VR experiences as a liminal journey that acknowledges the initial cultural distance but leads to meaningful engagement and empathy. Additionally, complementing this, the concept of proximal simulation learning (Nethsinghe, 2013) highlights that learning effectiveness increases when virtual environments closely mirror the real-world contexts they represent.

By pre-orienting the layout of watch huts, the rhythmic ways of bullock carts, the ambient sounds of the chena environment, and boat paddling, the VR application minimizes the psychological distance between the user and tradition. Interactive elements such as handling virtual elements or adjusting ambient conditions reinforce embodied cognition,

allowing users to not only observe but also learn by doing within a high-fidelity simulation (Nethsinghe, 2013).

This alignment with proximal simulation theory ensures that the VR tool not only captivates attention but also embeds lasting cultural knowledge through an immersive situated learning experience. Additionally, studies have highlighted the efficacy of VR in enhancing cultural education by providing multisensory experiences that foster deeper understanding and retention (Andonova et al., 2023; Crogman et al., 2025; Latta & Oberg, 1994). Integrating VR into cultural preservation strategies ensures that traditional musical forms are archived and revitalized, making them accessible and relevant to contemporary audiences.

In conclusion, the use of VR technology offers a transformative approach to sustaining Sri Lanka's traditional musical heritage. It addresses the challenges posed by modernization and generational shifts, ensuring that these invaluable cultural expressions resonate with and inspire future generations to come.

## **Conclusion**

This study demonstrates that Virtual Reality can play a transformative role in the safeguarding of Sri Lanka's traditional music heritage by extending preservation beyond static documentation into immersive, experiential engagement. By reconstructing the cultural, environmental, and social contexts in which traditional songs were originally performed, the VR application addresses key challenges posed by modernization, loss of transmission, and limited youth engagement. Grounded in ethnographic research and informed by archival materials, the application aligns with UNESCO's safeguarding framework while advancing an applied, community-centered approach. The findings suggest

that VR is not merely a technological tool for archiving, but a medium capable of supporting social sustainability, embodied learning, and intergenerational continuity. While this research focused primarily on audio-based traditions, it also highlights future directions for integrating textual archives and deeper ethnographic analysis. Ultimately, the study argues that safeguarding traditional music requires adaptable, participatory, and innovative strategies that recognize cultural heritage as living, evolving, and meaningful for present and future generations.

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## **A National Framework for the Assessment and Benchmarking of Digitalization Effectiveness in Sri Lankan Public Libraries**

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### **Abstract**

Digitalization of the public libraries is an essential indicator of institutional efficiency and service improvement, however there are no evidence-based frameworks to assess such initiatives available globally, especially in the context of developing countries. In Sri Lanka, large amounts of public money have been invested in the digitalization of libraries, but their sustainability is questionable, and some of them have ended up being underutilized or abandoned. The existing measures of digital success or benchmarking of digitalization effectiveness in public libraries are limited to the current evaluation criteria, which are based on the assessment of the Sri Lanka National Productivity Secretariat, Provincial Councils and other means, which do not fully reflect the broader aspects of the quality of services, user adoption, and sustainability.

The paper presents a unique, context-specific national model to assess and rank the benchmarking of digitalization effectiveness of Sri Lankan public libraries-filling a significant gap in the international library literature. The research methodology was a combination of secondary analysis of guidelines and manuals, structured interviews of librarians of

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digitized public libraries, and a focused literature review. Based on the existing evaluation models, namely the DeLone and McLean Information Systems Success Model, SERVQUAL, Unified Theory of Acceptance & Use of Technology (UTAUT), and ICTA Digital Maturity Model the study combined the strengths of these models into a tailored model. The resulting 100-point scoring system assesses libraries on weighted areas such as technological infrastructure, service quality, user engagement, and sustainability, with each indicator having a particular point value depending on its relative significance.

The suggested framework contributes to the academic debate on the assessment of digital libraries and can be used as a policy instrument. It facilitates evidence-based funding, transparency, and helps libraries to know where to improve. It is specifically designed to be relevant to the unique public library ecosystem in Sri Lanka, and to provide a replicable model to other developing countries

**Keywords:** library digitalization, library quality assurance, public library evaluation, digitalization effectiveness

## **Introduction**

Citizen-centric governance, interoperable data sharing, and human-centred service design are the key priorities of the national digital agenda of Sri Lanka, as envisaged by the National Digital Economy Strategy 2030 and the National Digital Government Policy, the two documents that outline the way forward to a responsive and inclusive Connected Digital Government (Information and Communication Technology Agency [ICTA], 2020; Ministry of Technology, 2023). Amidst this sweeping change, public libraries, of which there are about 1,375 across the country, are still not well-integrated, even though they are central to equitable access to

information, digital inclusion, and lifelong learning (Department of Cultural Affairs, 2022). Despite periodic implementation of government-funded digitization projects, their applicability and results are inconsistent, and in many cases, they are not in line with the current digital-government priorities due to the lack of a nationally standardized evaluation system.

The e-government studies warn that the contribution of technology is not enough to create more value to the population, and the effectiveness of the governance capacity, the quality of the services, and user-centred adoption should be gauged (United Nations, 2020; World Bank, 2016). At the same time, the digital-library scholarship advocates multi-dimensional assessment models incorporating usability, collection/content quality, service quality, system performance, and user outcomes rather than single-dimensional and input-oriented measures (Saracevic, 2004; Xie, 2021).

### **Research Aims and objectives**

This study aims to develop a uniform, evidence-based national system of measuring and benchmarking digitalization in Sri Lankan public libraries, which combine the aspects of technological innovation, service quality, user adoption and satisfaction, and long-term sustainability. In order to realize this goal, specific objectives are set: (1.) Determine the existing national and local practices criteria that are applied to measure digital success in Sri Lankan public libraries, (2.) Identify a set of key performance indicators (KPIs) through the consideration of their influence on the system functionality, quality of services, sustainability, and user satisfaction and in line with the digital Government Policy and (3.) Build a clear and open 100-point scoring rubric with domain and indicator weights, which allows consistent benchmarking and comparative ranking at national and provincial levels.

## **Literature Review**

Digitalization of public libraries is becoming recognized as the basis of equitable access to knowledge. In Sri Lanka, however, such initiatives are evaluated in a very fragmented manner. Research by Gunawardana (2018) in the Colombo District and Perera and Kumara (2021) in the Kandy and Anuradhapura District Public Libraries indicates that, even with the introduction of key services like Online Public Access Catalogues (OPACs) and a few e-resources, the outdated infrastructure, remaining skill deficits, and the lack of a national evaluation system all work against the development of meaningful performance standards. Policy mandates also exist in the form of citizen-centric digital services, especially the National Digital Economy Strategy 2030 and the Digital Government Policy (ICTA, 2020; Ministry of Technology, 2023), which are not focused on public libraries, which leads to adhoc funding and poor systematic management. On this background, Marasinghe(2022) criticizes infrastructural and policy mismatches in open-source library automation(digitalization). In comparison, the global models like the Digital Maturity Model in India (Sharma, 2019), the adaptation of the SERVQUAL instrument in the United Kingdom (Jones et al., 2020) and the sustainability-oriented framework in Canada (Smith and Lee, 2022) are the integration of technological, service, governance, and environmental indicators. Collectively, the evidences show that although the public libraries in Sri Lanka have embraced some of the essential digital technologies, there is an urgent need to implement wider structural reforms, especially in infrastructural modernization, professional development, policy alignment, and outcomes assessment to ensure they remain viable in the long-term.

This review synthesises evidence across several sectors to show good practice in the transparent design and use of benchmarking

mechanisms and indicator weighting. A practical example is the use of weighted domain scores in the National Institutional Ranking Framework (NIRF) in India by Kumar and Balaji (2021), and the same degree of methodological rigour is evident in the use of the Analytic Hierarchy Process in library evaluation by Hassanzadeh (2023). The importance of aligning the evaluation measures with the governmental goals is seen in the policy-aligned e-government evaluation in Pakistan by Hassan and Lee (2019). All these views point to the need to have a coherent, evidence-based, KPI-based national system of Sri Lankan public libraries, where evaluation, benchmarking and ranking procedures are aligned with the wider goals of digital governance and sustainability.

### **Research Methodology**

A mixed-methods design was used to formulate a framework to assess the digitalization of public libraries in Sri Lanka. The approach combined practitioner-based empirical evidence with scholarly and policy-based evidence to generate an evaluation framework that was practically useful and theoretically informed. The data were collected using four modalities: (i) National digital-government policies and public-library guidelines, (ii) Structured interviews with 18 public-library staff selected using purposive sampling, (iii) Observation memos based on the professional experience of the researchers(authors), and (iv) Relevant scholarly and grey literature on digital-library evaluation. Document analysis was used to identify extant criteria, structured interviews explored system use and service delivery, professional observations highlighted operational gaps, and a targeted literature review identified indicators within existing evaluation constructs.

Thematic analysis of interview and observation data themes were identified in relation to system use and operational challenges (Braun &

Clarke, 2006). The convergence of evidence across data sources resulted in a comprehensive and empirically supported framework that integrated practitioner experience with theoretical constructs, thereby providing valuable insights for the digitalization of public libraries in Sri Lanka. The evaluation practices in Sri Lankan public libraries are heterogeneous. The interviews with 18 public librarians in all nine provinces showed that only six of them, Western, Central, Southern, North Western, Uva, and Sabaragamuwa, perform annual performance assessment. The criteria used in these exercises, which are carried out through questionnaires, the submission of individual annual performance reports, and site visits by external committees, are largely similar. However, the scope of digitalization is limited; key indicators are concerned with (i) web-based library management system, (ii) the type of software used, and (iii) smart card-based services. Wider digital aspects, such as quality of online services, user adoption and satisfaction, innovation in service delivery, and sustainability of digital initiatives, are mostly not addressed.

## **Results and Discussions**

### **The landscape of Evaluation Practices in Sri Lankan Public Libraries (Objective 1)**

In policy alignment terms, there is no nationally agreed approach to measuring digital maturity or success in the public library sector. In addition, the national developed e-government evaluation frameworks have not been aligned to the sector specific needs, indicating a policy-practice gap. This disconnect is indicative of the dissonance between national visions of a connected, citizen-focused digital government and the lack of broad standards that connect operational realities with digital policy priorities. The results highlight the need to have a coherent framework to

align daily library operations with national digital strategies and be compatible with global best practices in the measurement of library performance (International Federation of Library Associations and Institutions [IFLA], 2021; Organisation for Economic Co-operation and Development [OECD], 2020).

### **Identification of Key Performance Indicators (KPIs) (Objective 2)**

The KPI framework that is being analyzed was developed through the combination of internationally recognized evaluation frameworks and Sri Lanka Digital Governance Policy and Governance Framework (ICTA, 2022a) to ensure both contextual applicability and methodological soundness. The ICTA Digital Maturity Model (ICTA, 2022b), provides an organized perspective to evaluate technological preparedness and gradual ability enhancement. The DeLone& McLean IS Success Model (DeLone& McLean, 2003), provides strong measures of system quality, information quality, and user satisfaction; at the same time, the Unified Theory of Acceptance and Use of Technology [UTAUT] (Venkatesh et al., 2003) captures behavioural variables that affect the adoption of the user. The SERVQUAL model (Parasuraman, Zeithaml, & Berry, 1988) makes sure that the quality of service is measured in terms of the user in the dimensions of reliability, responsiveness, assurance, empathy, and tangibility. Collectively, the models provide a multi-dimensional assessment method that can align library digitalization assessment with national e-government goals, thereby balancing technical performance, service delivery, and user experience.

### **Key Performance Indicators (KPIs) for Evaluating and benchmarking Library Digitalization Success (Objective 3)**

The process of selecting key performance indicators (KPIs) was based on a systematic, model-integrated approach that systematically covers four interconnected dimensions, including system functionality, service quality, sustainability, and user satisfaction, and is congruent with the Digital Governance Policy and Governance Framework of Sri Lanka. The framework was based on the ICTA Digital Maturity Model, DeLone and McLean Information Systems Success Model, UTAUT, and the SERVQUAL model. This methodological approach guarantees the comprehensiveness of the resulting KPIs by integrating both technical and socio-technical perspectives, thereby capturing technological readiness alongside user adoption, service quality, and long-term sustainability.

The measures of engagement that are based on organizational integration programs should be anchored on stringent evaluation systems. The proposed analytical structure in this paper is based on the ICTA Digital Maturity Model, DeLone & McLean IS Success Model, SERVQUAL Service Quality Model, and UTAUT Model aligned with the Digital Governance Policy in Sri Lanka. The resulting taxonomy provides full coverage of the four domains needed to achieve operational excellence, namely System Functionality, Service Quality, Sustainability, and User Satisfaction and Adoption.

The System functionality measured based on digitalization software under the category of Library Management (LMS). The functionalities of cataloguing, circulation, OPAC, reporting, and external database interoperability of LMSs were considered as basic framework for evaluation of system. System or the service reliability is quantified in terms of percentage uptime, error rate and recovery time. Interoperability Readiness addresses integrations with e-government systems, other libraries and digital repositories. Data Security Compliance involves

adherence to the Data Protection Act in Sri Lanka and security standards of digital governance.

Service Quality is operationalized by the dimensions of SERVQUAL and the Digital Governance Policy. Service Responsiveness includes turnaround time of digital service requests, and Accuracy & Reliability of Digital Services includes error-free transactions and successful user queries. Accessibility & Inclusivity must follow Web Content Accessibility Guidelines (WCAG) and support multiple languages, and User Support Services is a measure of the accessibility and responsiveness of digital helpdesks, chatbots, or AI support.

The sustainability is measured based on three criteria: ICT Resource Optimization (adoption of open-source, energy-efficient servers, and cloud); Financial Sustainability (sufficient budgetary allocation and recurrent funding of maintenance and upgrades); and Capacity Building (continuous professional development in digital skills). Finally, the correspondence with provincial and national e-government strategies also contextualizes these activities within Policy and Governance.

The User Satisfaction and Adoption metrics combine the information of UTAUT, DeLone& McLean, and SERVQUAL models. User Adoption Rate shows the proportion of active users of digital services. Perceived Usefulness reflects user feedback on knowledge access enhancement. Ease of Use includes the ratings of navigation, search, and interface. Overall Satisfaction Score aggregates feedback from periodic user surveys.

**Diagram 01** shows the policies and theoretical frameworks the integration sketch

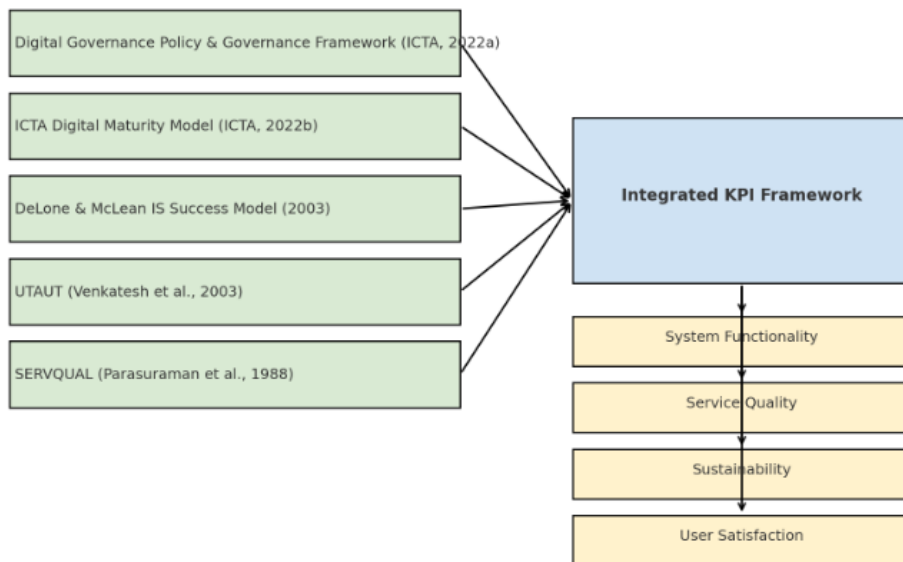


Diagram 01: The Model Integration

### **Identified Key Performance Indicators (KPIs) from the integrations;**

Evaluation of the key performance indicators (KPIs) related to the following integrations (*Diagram 01* shows that there is a four-fold division:

#### **1. System functionality (ICTA Digital Maturity Model and the DeLone& McLean IS Success Model)**

- *LMS Capability Index*: the extent of the functions provided (cataloguing, circulation, OPAC, reporting, integration with external databases).
- *System Reliability*: percent uptime, error rate and recovery time.
- *Interoperability Readiness*: degree of system integration with e-government systems, other libraries, and digital repositories.
- *Data Security Compliance*: the Data Protection Act of Sri Lanka and the digital governance security regulations.

## **2. Service quality (SERVQUAL and Digital Governance Policy)**

- Service Responsiveness: mean time to turnaround online service requests.
- Precision and Dependability of Digital Services: error-free transactions and successful user queries.
- Accessibility & Inclusivity: compliance with Web Content Accessibility Guidelines (WCAG) and the possibility to work with several languages.
- User Support Services: access and responsiveness of digital helpdesk, chatbots, or AI support.

## **3. Sustainability (ICTA Digital Maturity Model, Digital Governance Policy)**

- ICT Resource Optimization: open-source, energy-efficient servers, and cloud.
- Financial Sustainability: budgetary allocation and periodic funding of system maintenance and upgrades.
- Capacity Building: continuous professional training of the employees in digital skills.
- Policy & Governance Alignment: the alignment of library digital services with provincial and national e-government strategies.

## **4. User Satisfaction & Adoption (UTAUT, DeLone& McLean IS Success Model and SERVQUAL)**

- User Adoption Rate: the proportion of users using digital services.
- Perceived Usefulness: the user response to the extent to which digital services improve access to knowledge.
- Easy to use: user ratings of navigation, search, and interface design.

- Overall Satisfaction Score: a combination of user satisfaction survey results that are conducted periodically.

### **100-points Scoring Rubric with Domain and Indicator Weights**

Domain weighting prioritizes user satisfaction and adoption (30%) as the ultimate measure of digitalization success, followed by system functionality (25%) and service quality (25%) as the core enablers of performance. Sustainability (20%) ensures long-term operational, financial, and policy alignment, making the framework balanced between technical capacity, service delivery, and lasting impact.

### **100-Point Scoring Rubric for Evaluating Library Digitalization Success**

#### **1). System Functionality – 25 Points**

- LMS Capability Index – 8 points
- System Reliability – 6 points
- Interoperability Readiness – 6 points
- Data Security Compliance – 5 points

#### **2)Service Quality – 25 Points**

- Responsiveness – 6 points
- Accuracy and Reliability of Digital Services – 5 points
- Accessibility and Inclusivity – 7 points
- User Support Services – 7 points

#### **3) Sustainability – 20 Points**

- ICT Resource Optimization – 5 points
- Financial Sustainability – 5 points

- Capacity Building – 5 points
- Policy & Governance Alignment – 5 points

**4) User Satisfaction and Adoption – 30 Points**

- User Adoption Rate – 8 points
- Perceived Usefulness – 8 points
- Ease of Use – 7 points
- Overall Satisfaction Score – 7 points

**Scoring Benchmark (Table 01)**

The scoring benchmark is a systematic process of measuring the performance of an institution in the field of digital library services, thus allowing the evaluators to understand scores in a consistent manner and to base sound improvement strategies.

85–100	Excellent	Fully meets or exceeds best practice benchmarks; serves as a national model.
70–84	Good	Meets most KPIs with minor gaps in performance
55–69	Moderate	Adequate but with significant improvement needed in multiple areas.
Below 55	Low	Falls below minimum acceptable standards for digital service delivery.

**Table 01-** Criterion for Scoring Benchmark

**Conclusion**

The study reveals that the current assessment and benchmarking of digitalization effectiveness of digital initiatives are not consistent and aligned with the government policies; the current practices include only the basic operational checks and do not enable monitoring the progress over

time. A comprehensive KPI set was identified which covers system functionality, service quality, sustainability, and user satisfaction, thereby integrating national policy imperatives with globally accepted evaluation models. The resulting 100-point scoring rubric, which uses weighted domains and indicators, provides a transparent metric framework that enables consistent benchmarking and enables informed, coordinated national and provincial digital transformation.

### **Suggestion**

The KPI framework and scoring rubric is proposed to be tested again with a large sample size in order to validity of the findings.

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## **Reimagining Higher Education: Addressing Quality and Equity Challenges in India's EdTech Landscape**

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### **Abstract**

India stands out among developing nations for its vibrant and expansive higher education landscape. As the world's second-largest hub for education, the country hosts over 1,100 universities and more than 55,000 colleges and independent institutions, offering diverse academic programs. As reported in the *All India Survey on Higher Education (AISHE 2020–21)*, published in 2022, there are 1,113 universities, 43,796 colleges, and 11,296 standalone institutions operating across the country. These institutions not only cater to domestic students but also attract approximately 50,000 international students annually, primarily from neighbouring nations. While the sector has experienced significant growth, it has not been without its share of challenges.

The outbreak of the COVID-19 pandemic severely disrupted academic operations, resulting in a substantial loss of instructional hours—estimated at nearly 10 million. However, the swift adoption of educational technologies played a pivotal role in mitigating these losses and transforming pedagogical delivery. This technological shift likely contributed to the increase in the Gross Enrolment Ratio (GER), which rose to approximately 41 million in 2020–21 from 38 million in the previous academic year. This upward trajectory has continued since 2014–15, reflecting a net enrolment growth of 7.2 million students, or about 21% (AISHE, 2022).

Nonetheless, several persistent challenges continue to affect India's higher education sector, notably in areas such as financial and administrative management, equitable access, relevance of curriculum, and the integration of health awareness, ethical values, and quality benchmarks. Additionally, the evaluation and accreditation of institutions remain critical areas requiring attention. The COVID-19 crisis further complicated matters, accelerating a shift toward ICT-enabled online learning that necessitated a pedagogical transformation—one that emphasizes critical thinking, learner autonomy, and collaborative engagement.

While EdTech played a crucial role in extending educational access, facilitating expert-led instruction, and promoting the dissemination of updated content—even in remote regions—it also introduced new complexities. The rapid expansion of digital learning, particularly in both conventional and open/distance modes, occurred largely without sufficient quality control mechanisms. This exposed significant gaps in oversight and standardization.

Although digital platforms helped foster inclusivity and diversity, and allowed for monitoring mechanisms to track instructional quality, they simultaneously diminished opportunities for personal interaction and hands-on training. This often led to decreased learner engagement and contributed to the growing concern over the mass production of inadequately trained, partially skilled, and underprepared graduates. Against this backdrop, the present chapter seeks to critically examine the multifaceted implications of EdTech in higher education, beginning with its emergence and extending to the opportunities and quality-related challenges it presents today.

**Keywords:** EdTech in Higher Education, Digital Learning Quality, Access and Equity, Post-COVID Pedagogy, Skill Development Challenges

**Introduction:**

Educational technology (EdTech) has emerged as a foundational element in both formal and informal learning landscapes across India. It supports a vast array of disciplines and caters to learners at various stages through diverse online platforms. Massive Open Online Courses (MOOCs) such as Coursera, edX, Udemy, and Simplilearn provide access to content developed by leading global universities and industry professionals. In parallel, the Indian government has introduced several digital learning initiatives to promote inclusive online education. Among these, SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) offers free online courses developed by premier Indian institutions, while the National Digital Library (NDL) provides centralized access to a vast repository of educational materials.

A strong test-preparation culture further fuels the EdTech ecosystem, especially for national-level competitive examinations such as JEE, NEET, UPSC, and CAT. Platforms like BYJU's, Unacademy, and Toppr have become widely popular due to their structured and interactive preparatory resources. Many of these platforms have also localized their offerings, acknowledging India's linguistic diversity by providing content in multiple regional languages, thereby improving accessibility for non-English-speaking learners.

Additionally, skill-oriented and vocational education has gained prominence, with platforms such as Skill India, the National Skill Development Corporation (NSDC), and LinkedIn Learning offering practical training programs aimed at enhancing employability. The integration of artificial intelligence (AI) has further transformed the learning experience by enabling adaptive learning paths, personalized feedback, and content recommendations based on individual performance

metrics. Moreover, the use of Augmented Reality (AR) and Virtual Reality (VR) is making inroads into subject areas that benefit from experiential learning, such as healthcare, engineering, and design.

India's dynamic EdTech start-up ecosystem continues to expand, focusing on diverse aspects such as digital content creation, assessment frameworks, and learning management systems. This proliferation of technology-enhanced education has not only expanded access to quality learning within the country but also created global pathways through industry-recognized certification programs. However, key concerns remain. Persistent challenges—including the digital divide, inconsistent content quality, data security issues, and affordability—highlight the urgent need for stronger governance, equitable access, and more effective regulatory frameworks.

### **An Overview of the Educational Technology in India**

While Educational Technology (EdTech) has seen rapid advancement in Indian higher education over the past decade, its roots in the country extend much further back. India's early experimentation with technology-assisted learning can be traced to educational broadcasting initiatives that utilized radio as a pedagogical tool.

One of the earliest efforts was the School Broadcast Project, launched in 1937, targeting school-going children and initially implemented in major urban centers including Delhi, Calcutta, Madras, and Bombay. This initiative marked a pioneering attempt to use mass media for formal education. Subsequently, in 1956, the Adult Education and Community Development Project, also known as the Radio Forum, was introduced to support literacy and development among rural populations. This program reached villagers in 144 communities near Pune,

Maharashtra, and represented a community-based model of educational engagement.

Further expanding the scope of radio-based learning, the Farm and Home Broadcast Project was initiated in 1966 to disseminate agricultural knowledge and rural development information to farmers and rural households. A notable milestone in higher education came in 1965 with the establishment of the University Broadcast Project, which sought to extend academic content to a broader and more diverse audience. This initiative offered two categories of programming: general education and enrichment content, designed to supplement formal university curricula and provide lifelong learning opportunities (Vyas, Sharma et al. 2014).

These early ventures laid a foundational framework for the later evolution of EdTech in India, reflecting a longstanding commitment to leveraging technology to enhance educational access and inclusivity across socio-economic and geographic boundaries.

The origins of educational technology in India can be significantly traced to the Satellite Instructional Television Experiment (SITE)—a landmark initiative in the country's media-based learning history. Developed collaboratively by the Indian Space Research Organisation (ISRO) and the National Aeronautics and Space Administration (NASA), the project was formalized in 1969 through an agreement between NASA and India's Department of Atomic Energy (DAE). SITE was operational from August 1975 to July 1976 and received widespread national attention (Krige et al., 2013, p. 235).

The principal goal of SITE was to deliver educational and informational television broadcasts to rural populations, thereby addressing the educational disparities in remote areas. The experiment reached approximately 2,400 villages across 20 districts in six Indian states and

union territories: Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Orissa (now Odisha), and Rajasthan.

SITE was driven by two core objectives: first, to disseminate essential knowledge to economically and educationally marginalized communities via satellite-based communication; and second, to develop and refine India's technological capabilities in satellite communication systems. This initiative not only marked a pioneering moment in India's EdTech journey but also contributed to the nation's subsequent advancements in educational broadcasting and digital infrastructure (Agrawal & Raghaviah, 2008).

The integration of educational technology (EdTech) into India's learning ecosystem has evolved over decades, reflecting a steady progression from early radio-based initiatives to a robust digital infrastructure supporting both formal and informal education. While recent advancements in EdTech are often associated with digital platforms and online learning, its roots in India can be traced back to the mid-20th century. A significant early innovation was the radio-vision technique, first pioneered by the BBC, which combined audio explanations with visual materials such as slides and charts. In India, the National Council of Educational Research and Training (NCERT) experimented with this method during the 1975–76 Satellite Instructional Television Experiment (SITE) as part of a multimedia approach to in-service teacher training.

SITE, developed through a partnership between NASA and the Indian Space Research Organisation (ISRO), was implemented between August 1975 and July 1976. It aimed to broadcast educational television programmes to underserved rural populations in six Indian states, reaching 2,400 villages. SITE not only provided vital educational content to communities with limited access but also strengthened India's capacity in

satellite communications. Alongside this, radio emerged as a key medium for educational dissemination. Projects like the 1979–80 Radio Pilot Project, launched in Rajasthan to teach Hindi to schoolchildren, and the subsequent collaborations between All India Radio (AIR) and IGNOU in the 1990s, reflect the growing reliance on audio-based learning. The launch of Gyan-Vani, India's first educational FM radio network in 2001, further extended educational broadcasting to a national scale. Community radio stations, introduced in 2004, expanded localized educational access, especially in rural and marginalized areas.

Parallel to these developments, India saw the emergence of Open Educational Resources (OER) to promote equitable access to learning. These resources, openly licensed and freely available, have played a transformative role in democratizing education. Major initiatives such as the National Repository of Open Educational Resources (NROER), launched in 2013 by CIET-NCERT, and the National Digital Library of India (NDLI), developed by IIT Kharagpur, have created central platforms for high-quality academic content. Other key OER efforts include e-PG Pathshala, NPTEL, eGyanKosh, and the UGC's e-Content Courseware, each designed to deliver comprehensive learning materials across disciplines. These initiatives not only reduce educational costs but also provide inclusive access to learners from diverse backgrounds, further enhanced by Creative Commons licensing for open sharing and adaptation.

The advent of Massive Open Online Courses (MOOCs) significantly reshaped the Indian EdTech landscape post-2012. With global platforms like Coursera, edX, and Udacity making inroads, Indian students rapidly adopted these tools to access international university content. The Indian government's SWAYAM platform, launched in 2017, consolidated these efforts by offering free online courses across disciplines, including

school and higher education, in partnership with IITs and other national institutions. Indian universities also began developing localized MOOCs tailored to regional needs. Platforms such as UpGrad, Simplilearn, and Unacademy expanded access to certification and vocational training, while partnerships between Indian and global institutions enabled the offering of specialized content in fields like data science, AI, and professional development.

To support the growing demand for open and distance learning, the government launched multiple digital initiatives. Sakshat and Shishya offered centralized access to e-books and school content, while VidyaVahini aimed to bring IT education to rural schools. The e-PG Pathshala project, launched in 2013 and managed by INFLIBNET, provided postgraduate e-content for structured academic study. MookIT, developed by IIT Kanpur in 2014, introduced a lightweight, scalable MOOC platform using open-source technology, followed by IITBombayX, a nonprofit platform developed with funding from the Ministry of Education. These platforms underscore India's commitment to accessible, quality-driven online education, aligned with the National Education Policy's vision for digital transformation in higher learning.

India has quickly emerged as one of the world's largest consumers and producers of EdTech. By 2016, India accounted for 27% of the edX user base and had over 1.5 million Coursera users, ranking just behind the United States. While global platforms continue to thrive, Indian EdTech companies have built strong domestic ecosystems. BYJU's has transformed K-12 learning through app-based interactivity, while Unacademy and Toppr lead in competitive exam preparation. Simplilearn, Great Learning, and UpGrad have become go-to platforms for working professionals seeking reskilling in emerging technologies.

Despite these achievements, critical challenges remain. Issues such as the digital divide, affordability, data privacy, and content quality require continued attention. Infrastructure limitations in rural and economically weaker regions hinder equitable access to digital learning. Moreover, while EdTech enables scalability, concerns about reduced personal interaction, learner motivation, and regulatory oversight pose ongoing risks. Addressing these concerns through inclusive policies, robust quality frameworks, and technological innovation will be essential to ensure that EdTech contributes meaningfully to India's broader educational and developmental goals.

**Post-Pandemic Acceleration:**

Prior to the COVID-19 pandemic, educational technology (EdTech) in India was evolving steadily, primarily serving as a supplementary tool to conventional classroom-based instruction. Traditional face-to-face learning continued to dominate schools and higher education institutions, with smart classrooms and digital resources being adopted selectively, mostly in urban or well-funded settings. Similarly, open and distance learning (ODL) institutions had begun integrating technology through limited experiments in digital content delivery. However, the onset of the pandemic in 2020 marked a pivotal shift, accelerating the adoption and expansion of EdTech across all educational levels. The sudden closure of educational institutions necessitated an immediate pivot to online learning, dramatically increasing the demand for accessible, flexible, and scalable digital education solutions.

In the post-pandemic context, EdTech emerged as a critical driver of continuity and innovation in India's education system. The industry has since experienced exponential growth, with forecasts estimating that

India's EdTech market will reach a valuation of US\$ 10 billion by 2025. This trajectory is underpinned by multiple factors: the rapid penetration of the internet and smartphones, a tech-savvy youth demographic, and increasing demand for job-relevant skills in a competitive labor market. The proliferation of online platforms and digital content has also reshaped learner preferences and expectations, prompting a systemic transformation in how education is delivered and consumed.

However, this rapid growth has not been without implications for traditional education systems. The swift rise of EdTech has, to some extent, disrupted established educational models, exposing gaps in digital infrastructure, pedagogy, and faculty readiness. Many conventional institutions have struggled to keep pace with the technological advancements offered by EdTech startups. This disruption has led to calls for modernization and innovation within formal education systems. A joint report by PGA Labs and the Indian Venture Capital Association (IVCA) projects that India's overall education sector will expand from US\$ 117 billion in 2020 to US\$ 225 billion by 2025, highlighting the scale of opportunity—and the urgency for integration—within the EdTech ecosystem (Statista, 2023).

The post-pandemic surge in India's EdTech sector can be attributed to a confluence of enabling factors, among which the increased penetration of internet connectivity and widespread use of smart devices are the most influential. The proliferation of smartphones—used extensively for communication, entertainment, and social networking—has significantly expanded digital access across both urban and rural areas. As the adoption of smart and connected devices continues to grow, India is witnessing the formation of a large, sustainable digital user base. This digital expansion has been accompanied by a dramatic rise in online content consumption,

particularly in video format. According to a recent *ComScore* survey, YouTube has become one of the most dominant platforms in the country, with 80% of internet users aged 18 and above actively using the site. Data from June 2023 shows that users aged 35 and above spent an average of 70 minutes per day on YouTube (Mishra, 2023). These trends reflect the platform's educational potential, as approximately 80% of higher education students in India reportedly consume video content on YouTube—many of whom engage with academic content or use it to supplement their coursework.

Concurrently, the emergence of advanced technologies such as artificial intelligence (AI), machine learning (ML), and blockchain has transformed workforce requirements. As the demand for specialized skills rises, a growing number of individuals are turning to online platforms for upskilling and professional development. With a substantial portion of the Indian population falling within the 15 to 64 age bracket, skill development has become central to improving employability in an increasingly competitive labor market. Projections suggest that by 2050, nearly 280 million individuals will be entering the job market, reinforcing the urgency of scalable and accessible digital learning solutions. As a result, online certification, reskilling, and vocational training are no longer supplementary but are increasingly integrated into the broader education-to-employment pathway.

Despite these promising developments, challenges persist. Key among them is the need to ensure equitable access to high-quality education, particularly for underserved and digitally marginalized communities. Bridging the digital divide, maintaining content quality, ensuring affordability, and developing inclusive pedagogical frameworks remain critical goals for the future sustainability and impact of EdTech in

India. Moving forward, the sector must prioritize inclusive growth strategies to truly democratize learning and meet the evolving needs of India's diverse learner population.

### **Quality Concerns and Issues**

Quality concerns and issues in the context of EdTech and higher education are important considerations that impact both students and institutions. While EdTech has the potential to enhance the learning experience, it also presents several challenges that need to be addressed. The following are a few key quality concerns and issues:

#### ***Lack of Pedagogical Effectiveness:***

A significant concern in the contemporary educational landscape is the ineffectiveness of teaching and learning approaches, particularly when technological tools are integrated without a sound pedagogical foundation. This situation arises when instructional strategies, curriculum design, or teaching practices fail to facilitate meaningful student engagement, comprehension, or learning outcomes. Multiple factors can contribute to this challenge, including poorly designed instructional materials, inadequate teacher training in the use of EdTech tools, and a lack of alignment between educational technologies and learner needs. Often, digital content is created without sufficient pedagogical expertise or is repurposed hastily, leading to outdated or ineffective resources. Moreover, many EdTech platforms emphasize content delivery over learner-centered pedagogy, resulting in a superficial learning experience. When technology is treated as a substitute rather than a complement to traditional teaching, the overall quality of education may decline. Compounding this issue is the inconsistency in the quality of educational content across platforms, which can exacerbate learning gaps rather than bridge them. Ensuring that EdTech tools are grounded in effective pedagogical principles, tailored to diverse learning needs, and supported by teacher training is essential for achieving meaningful and

equitable educational outcomes.

***Absence of skills in adapting to the Ed Tech:***

During the COVID-19 pandemic, educators in India's higher education sector were compelled to rapidly adapt their pedagogical practices in response to the shift to remote learning. Faced with unprecedented disruption, many instructors adopted innovative teaching methods that were not necessarily grounded in formal educational theories but emerged from the urgent need to maintain student engagement and learning continuity. These improvised approaches often reflected a pragmatic blend of creativity and technological experimentation. Informal discussions conducted by the researcher with several university professors revealed a shared sense of professional responsibility among faculty members. They perceived it as their ethical and academic obligation to ensure that meaningful instruction continued despite the constraints of quarantine. This sense of duty motivated them to explore and integrate digital tools into their teaching, not only to deliver content but also to foster a semblance of academic community and structure during a time of widespread uncertainty and isolation (Dutta, 2020). This, however, required a lot of time and embracing technological skills.

Aligned with the Technological Pedagogical Content Knowledge (TPACK) framework (Kurt, 2019), the effective integration of technological tools—ranging from hardware and software to digital applications—should be strategically directed toward enhancing students' understanding of subject matter. The TPACK model underscores the importance of intersecting three core domains of teacher knowledge: Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). When these domains are effectively interwoven, they create a robust foundation for quality teaching and learning experiences. To fully harness the potential of EdTech, however, ongoing professional development and structured training are essential. Without

adequate support, even the best technological infrastructure may fall short in achieving meaningful educational outcomes.

Despite two years of rapid digitization following the onset of the COVID-19 pandemic, significant challenges remain in the digital preparedness of educators. A recent survey reveals that 31% of teachers still lack adequate proficiency in digital tools, underscoring the need for more comprehensive and accessible training programmes. Interestingly, 79.34% of teachers reported acquiring digital skills through hands-on experience, while only 35.54% had access to formal courses provided by educational institutions. A smaller percentage—25.62%—learned from informal networks such as peers, family, or colleagues, and 19.01% self-financed their upskilling. In an earlier survey conducted in September 2020, six months into the pandemic, 80% of higher education faculty expressed discomfort with online teaching, reflecting the abrupt nature of the transition and lack of preparedness.

Recent data indicates improvements in digital competence, though gaps persist. Approximately 93.39% of educators are now able to operate virtual classrooms, and 50.41% are capable of conducting online assessments. However, only 40.50% can effectively use content-authoring tools, 31.40% are proficient in managing Learning Management Systems (LMS), and just 14.88% possess the skills to operate virtual cloud laboratories. These findings highlight the uneven nature of digital adoption and the need for differentiated, role-specific capacity-building initiatives to ensure that technological integration in higher education is both pedagogically sound and equitable (TeamLease, 2022). Digital competency of the teachers of higher education is a serious concern in India and mandatory training is required to use the EdTech in higher education.

***Accessibility and Digital Divide:***

Ensuring that educational technology (EdTech) tools and online courses are accessible to all learners, including students with disabilities, remains a pressing concern in India's evolving digital education landscape. Accessibility challenges can significantly hinder the learning experience for marginalized students, especially those requiring assistive technologies or alternative content formats. One of the primary barriers to equitable digital learning is the persistent digital divide, which is particularly pronounced in rural areas and among economically disadvantaged populations.

Many students lack access to reliable internet connectivity, electricity, or appropriate digital devices, limiting their participation in online education. According to the *ICUBE 2020* report by IAMAI and Kantar, internet usage in India continued to grow during the pandemic, registering an 8% year-on-year increase. Urban areas saw a 4% rise in active internet users, while rural areas demonstrated a more substantial 13% growth, reflecting expanding digital penetration (Kantar, 2021). Despite this progress, disparities in internet access remain, especially along lines of gender, location (rural vs. urban), caste, and age. The digital gender gap is particularly notable, with 58% of internet users being male and only 42% female, a trend consistent across both urban (57:43) and rural (58:42) settings.

While increasing internet adoption in rural regions is an encouraging development, structural inequalities continue to inhibit universal access to digital learning opportunities. Research highlights that men are more likely to own mobile phones and have greater access to internet services than women, further entrenching gender-based exclusion (Chandola, 2022).

In addition to socio-economic barriers, technical difficulties such as software glitches, platform instability, and connectivity issues frequently disrupt online learning. These challenges can contribute to frustration among both students and faculty, diminishing the perceived effectiveness of EdTech. Moreover, the rapid evolution of educational technologies poses significant challenges for institutions attempting to maintain up-to-date infrastructure and content delivery systems. In regions prone to frequent power outages, or where technical support is limited or absent, the effective deployment of digital education tools remains especially difficult. As India continues to invest in digital education, addressing these disparities through inclusive policies, improved infrastructure, and localized support mechanisms is critical to ensuring that the benefits of EdTech are equitably distributed across the nation.

***Equity, Inclusion and Flexibility:***

As previously discussed, the digital divide remains a critical barrier to equitable access in online education, particularly in the Indian context. A significant number of students lack access to essential digital devices and high-speed internet, thereby limiting their participation in remote learning environments. This disparity not only hinders educational continuity but also amplifies existing inequalities, especially among rural and economically disadvantaged groups. In many cases, students are unable to attend online classes due to persistent connectivity issues or inadequate infrastructure. Conversely, for some students, poor connectivity is cited as a reason to disengage from classes, often resulting in passive participation—such as logging into sessions without enabling video, thereby reducing meaningful interaction.

While online education provides flexibility and access, it also presents notable limitations when compared to traditional in-person learning. Students accustomed to physical classroom settings frequently struggle to adapt to remote academic formats, where the absence of face-to-face interaction can negatively affect motivation and retention. In-person education offers irreplaceable advantages such as collaborative learning, critical thinking development, socialization, and interpersonal communication, all of which are essential for holistic development. It also supports the cultivation of organizational skills, personal discipline, and career readiness, areas in which online platforms often fall short. Thus, while digital learning has expanded educational access during crises, it cannot fully substitute for the multidimensional benefits of conventional classroom-based pedagogy (Singhal, 2017).

One of the most pressing limitations in the shift to online education is the lack of stable internet connectivity and mobile data availability, particularly for students in remote or economically disadvantaged regions. Studies highlight that final-year students, nearing graduation, are especially affected, expressing a strong sense of loss regarding the absence of in-person classroom interactions. Furthermore, mobile data constraints emerge as a recurring barrier; students frequently exhaust their data allocations after attending online lectures, leaving them unable to complete assignments or conduct further research. Many students report frustration and anxiety due to recurring network disruptions, which directly affect their academic progress and mental well-being.

Despite these challenges, educators acknowledge the importance of sustaining online education, especially for the estimated 80% of students who are able to participate meaningfully. Teachers advocate for a dual strategy—continuing digital learning while planning supplementary

support for the 20% who remain underserved, once in-person education resumes. In the face of technological barriers, many students have shown resilience by collaborating with peers, accessing recorded lectures, and completing coursework through alternative means. As one student aptly expressed, “*Network issues may be hurdles, but they don’t dampen our spirits.*” This reflects the adaptive strategies and determination displayed by learners in overcoming structural limitations, underscoring both the promise and the persistent inequalities in India’s EdTech landscape (Dutta, 2020).

***Data Privacy and Security:***

As EdTech platforms continue to expand their role in educational delivery, data privacy and security have emerged as critical concerns. These platforms routinely collect vast amounts of student data—ranging from personal identifiers and academic records to behavioral analytics—which are often used to personalize learning experiences, enhance educational outcomes, and optimize instructional strategies. However, this data, while valuable for pedagogical purposes, also introduces significant privacy risks. One of the central challenges lies in the lack of robust legal frameworks and clarity around data governance. In India, data privacy regulations remain in flux, with inconsistencies across states and a lack of comprehensive national guidelines, leaving many educators, institutions, and administrators uncertain about their responsibilities and compliance obligations.

Despite the growing reliance on digital tools, many EdTech companies have prioritized content development and delivery, often at the expense of building secure and transparent data practices. A notable concern is the opacity surrounding data collection, storage, and access.

Users—including educators, students, and parents—are rarely informed in clear terms about what data is being collected, how it will be used, who will have access to it, and for what duration it will be retained. This lack of transparency undermines informed consent and can erode trust in EdTech services. Additionally, the risk of data breaches and unauthorized access increases when privacy safeguards are inadequate or inconsistently enforced. To ensure ethical and secure use of educational technologies, it is imperative for EdTech providers to adopt clear data handling policies, implement strong cybersecurity protocols, and promote accountability and transparency in their operations. Without these safeguards, the educational gains of digital transformation may come at the cost of students' privacy and digital rights (Education Daily, 2023).

A growing body of research on privacy and security in e-learning underscores the importance of adopting comprehensive technological and policy-oriented frameworks to safeguard user data. A recent study highlights several key areas essential for protecting privacy in digital learning environments. Network privacy is a primary concern, with technologies such as Onion Routing proposed to mitigate the risks of traffic analysis attacks, ensuring that user communication remains confidential even as data moves across networks. Another critical area is location privacy, particularly relevant for mobile learners whose geographic data can be vulnerable to tracking and misuse. Preserving the anonymity of user locations is increasingly important in the age of ubiquitous mobile access. In addition to technical protections, the study advocates for policy-based approaches to manage privacy and security within e-learning systems. These approaches emphasize the development of mechanisms that align with established Privacy Principles, using formal policy specifications and negotiation protocols to govern data sharing and consent. Such frameworks

aim to provide transparency and user control over how personal information is accessed and utilized. Finally, the integration of trust mechanisms is highlighted as a vital component in reinforcing privacy.

These mechanisms help establish and maintain trust relationships among users, systems, and institutions by validating compliance with privacy standards and facilitating responsible data practices. Together, these strategies present a multi-layered approach to privacy protection in e-learning, combining technological innovation with ethical governance (Yee et al., 2006).

***Quality Control and Accreditation:***

As online education becomes increasingly embedded within the higher education ecosystem, the need for robust quality control mechanisms and formal accreditation has gained prominence. The proliferation of EdTech platforms and digital learning tools requires consistent oversight to ensure that programmes meet established educational standards and uphold academic integrity. Accreditation of online programmes remains an ongoing challenge, particularly given the rapid growth and diversification of digital offerings. Effective quality assurance in EdTech necessitates structured course design that incorporates clear learning outcomes, engaging and interactive content, authentic assessment strategies, and intuitive user interfaces. Among the most widely used EdTech tools, video content has become central to online learning, particularly in higher education. Platforms like YouTube are extensively utilized by students to grasp complex theories, explore conceptual topics, and access supplementary educational materials.

However, the unregulated nature of user-generated video content introduces significant concerns about accuracy and reliability. While

YouTube is perceived as an effective informal learning tool—evident in a 2018 Pew survey where 90% of U.S. adults considered it valuable for learning, and 60% of Generation Z respondents preferred it over traditional books—its open-access model also facilitates the spread of misinformation. A global investigation by *The Guardian* (2022) warned that YouTube serves as a major conduit for online disinformation, with inadequate efforts to counter the dissemination of falsehoods. Supporting this concern, a study by Oi-Yee Li et al. (2020) analyzing 150 widely viewed COVID-19-related YouTube videos found that 27.5% contained non-factual information, collectively amassing over 62 million views, while government and professional videos were exclusively factual. The disproportionate influence of a few content creators further compounds the issue, as the top 3% of channels account for 85% of total viewership, according to 2018 estimates.

These findings underline the urgent need for critical evaluation and content curation in the use of video-based EdTech tools. While platforms like YouTube offer accessibility and engagement benefits, their educational use must be accompanied by media literacy training, integration of verified academic content, and the development of platform-specific quality standards. Institutions and EdTech developers must take proactive steps to balance open access with quality assurance, ensuring that learners are equipped not only with content but with the skills to discern credible sources from misleading ones (Garisto, 2020).

India's higher education system operates within a complex and highly regulated framework, which presents significant challenges for the seamless integration of educational technology (EdTech). Despite the growing demand for digital learning, institutions offering online courses or degree programmes often encounter numerous regulatory hurdles, including unclear approval processes,

overlapping jurisdiction of regulatory bodies, and evolving policy guidelines.

Bodies such as the University Grants Commission (UGC) and the All India Council for Technical Education (AICTE) impose strict compliance standards for programme delivery, faculty requirements, assessment mechanisms, and accreditation, which may not always align with the flexibility and innovation offered by EdTech platforms. Moreover, the lack of a unified digital education policy can result in inconsistencies across states and institutions, further complicating implementation. While recent initiatives like the National Education Policy (NEP) 2020 and the UGC's efforts to formalize online and blended learning guidelines represent steps forward, many institutions still face ambiguity and bureaucratic delays in adopting or scaling digital education models. For EdTech integration to thrive within Indian higher education, clear, enabling policies and coordinated governance mechanisms are essential to ensure institutional autonomy while maintaining academic quality and regulatory compliance.

***Language Conundrum:***

India's extraordinary linguistic diversity presents both unique opportunities and significant challenges for the integration of educational technology (EdTech). The Indian Constitution officially recognizes 22 languages, and this multilingualism is deeply embedded in the country's educational system. Across states, the medium of instruction varies, with some using Hindi or English, while others emphasize regional languages such as Tamil, Telugu, Bengali, or Marathi. Students often navigate multilingual environments, speaking one language at home, another in their community, and studying in yet another at school—a phenomenon that can enrich cultural identity but also complicates efforts toward standardized education (Jayaram, 1993, p. 93). This complexity makes the development of high-quality, uniform educational content in multiple languages a substantial logistical and pedagogical challenge for EdTech providers.

While the rise of digital platforms has created avenues for multilingual content delivery, most EdTech offerings continue to be English-dominant, potentially marginalizing non-English speakers. Some platforms and tools—such as Google Translate and Microsoft Translator—enable the basic translation of learning materials, but their limitations in handling culturally embedded concepts and domain-specific terminology undermine their reliability for formal education. Ensuring accuracy, contextual relevance, and cultural sensitivity in translated content is critical, particularly in disciplines where language nuances shape meaning. To address these issues, bilingual education models have been implemented in several states, promoting learning in both a regional language and a lingua franca to facilitate comprehension and communication.

However, the scalability and effectiveness of such models depend on thoughtful implementation and robust content development strategies. Ultimately, inclusive EdTech development in India requires a nuanced understanding of linguistic plurality, collaborative content creation with local educators, and technological innovations that go beyond automated translation to reflect the cultural and educational realities of India's diverse learner population.

***Content Localization and Ownership:***

Adapting educational content to the culturally and linguistically diverse landscape of India is both essential and challenging. The process of localizing and customizing content, ensuring it resonates with regional norms, languages, and pedagogical contexts, is often complex, resource-intensive, and demands interdisciplinary collaboration. The need for such adaptation is underscored by India's position in the 2023 EF English

Proficiency Index, which ranked the country 60th out of 113, placing it within the Moderate Proficiency category (EF EPI, 2023). This highlights the importance of delivering educational content in regional languages to optimize comprehension, engagement, and learning retention. Research has consistently shown that individuals irrespective of age tend to understand and recall information more effectively when it is presented in their mother tongue. Moreover, the phenomenon of cultural shock, typically discussed in the context of studying abroad, is also relevant for domestic learners accessing EdTech or online education systems that lack cultural or linguistic alignment. By incorporating localized content that reflects regional values, issues, and examples, educational platforms can create more inclusive and meaningful learning experiences and tap into India's vast and heterogeneous higher education market.

However, the localization of content is not without complications. A key challenge arises from content ownership disputes, especially in collaborative efforts involving authors, educators, translators, editors, and institutions. As course materials are translated, modified, or enriched with local relevance, questions regarding intellectual property rights and attribution become increasingly contentious, particularly in the development of online courses. To address such issues and promote open access to quality educational resources, many Indian institutions have turned to Open Educational Resources (OER). Officially recognized by the Indian government in 2008, the use of OER was endorsed by the National Knowledge Commission (NKC) through the launch of the 'National e-Content Curriculum Initiative', aimed at encouraging the creation, adaptation, and dissemination of freely available educational content. This initiative culminated in the establishment of the National Repository of Open Educational Resources (NROER) in 2013, providing a centralized

platform for the collaborative development and distribution of culturally relevant digital materials (Padhi, 2018, p. 55). The continued growth of OER holds promise for reducing localization costs, enhancing equity, and addressing content-related conflicts in India's expanding EdTech ecosystem.

**The road ahead:**

Educational Technology (EdTech) is poised to play a transformative role in India's higher education system, offering promising avenues to enhance access, flexibility, and learner engagement. However, for EdTech to fulfill this potential, it must simultaneously address critical challenges related to quality assurance, accessibility, and affordability. A persistent concern is the inconsistency in the quality of online course content; some materials remain outdated, poorly structured, or pedagogically weak. Ensuring that educational resources are regularly updated, factually accurate, and designed according to effective instructional principles is essential.

Furthermore, while EdTech solutions can increase educational reach, their cost remains a barrier, particularly for students from low-income and marginalized communities. Hidden expenses such as requirements to purchase additional software, learning materials, or devices can further widen the digital divide. Hence, a critical assessment of the cost-effectiveness and inclusivity of technology-enhanced learning models is necessary to ensure equity.

To address these multifaceted challenges, collaboration between educational institutions, EdTech providers, and government bodies is imperative. Joint efforts must focus on improving digital infrastructure, offering training and capacity-building programmes for educators and students, and embedding accessibility and data privacy protections within

the design of EdTech platforms. Moreover, regulatory agencies and accreditation bodies play a vital role in upholding educational standards for online learning by defining clear guidelines, monitoring compliance, and certifying programme quality. Policy frameworks should promote equitable access to digital learning, fund initiatives that support local content development, and recognize the importance of linguistic, cultural, and socio-economic diversity. Culturally responsive content that reflects local realities not only improves learner engagement but also enables meaningful data generation from diverse contexts, supporting long-term improvements in content delivery and educational outcomes. A collaborative, inclusive, and context-sensitive approach will be essential to harness the full potential of EdTech in shaping a more equitable and future-ready higher education landscape in India.

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