Reviews and Letters in Social Sciences

NARRATIVE REVIEW

Mobile Applications in the Indian Tourism Industry: A Narrative Review of Advantages and Limitations

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ARTICLE INFO

Prepared 25th October 2026, www.esrapublications.com

Revised & Published 9h November 2026

ABSTRACT

Background. India's tourism sector is overwhelmingly domestic and increasingly mediated by smartphones. Mobile applications now handle journey planning, ticketing, payments, identity verification and destination discovery.
Aim. This narrative review synthesises academic and official evidence on the role of mobile apps in Indian tourism, with emphasis on their advantages and limitations.
Methods. Peer-reviewed studies, preprints, government statistics and credible trade reporting were identified through targeted searches and appraised narratively.
Findings. Official data show 2,948 million domestic tourist visits and 9.95 million foreign tourist arrivals in 2024 [1,2]. Digital public infrastructure, especially UPI, which processed 228.3 billion transactions in 2025 [3], underpins app-based travel services. Reported advantages include convenience, integrated payments, contactless processing and richer real-time information. Limitations include reliability under peak load, privacy and surveillance concerns, uneven language and accessibility support, trust and cost barriers, and a thin, city-specific evidence base.
Conclusion. Apps are already core infrastructure for Indian tourism, but inclusive design, data-protection safeguards, resilience engineering and better destination-level evidence are needed to turn rapid adoption into equitable and sustainable outcomes.

Keywords: India; tourism; mobile applications; m-tourism; smart tourism; UPI; IRCTC; Digi Yatra; technology adoption.

1. Introduction

Information and communication technologies have reshaped tourism for three decades, first through reservation systems and websites and later through social media and mobile platforms [4]. The smartphone is now the principal device through which many travellers search, book, pay, navigate and share experiences. Reviews of the travel domain describe smartphone apps as tools that extend traveller capability before and during a trip and that can also support more sustainable travel choices [5]. The wider concept of "smart tourism" frames this shift as the use of data and connected technologies to create value for destinations, businesses and tourists, while also noting drawbacks [6].



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India is a particularly instructive case. It combines a very large domestic travel market, a fast-expanding digital public infrastructure, a diverse population with unequal digital access and a government that has made tourism promotion and digital services policy priorities. This review asks three questions: (1). what is the scale and shape of Indian tourism that apps serve; (2). what categories of apps matter and what does the evidence say about their adoption; and (3). what are their principal advantages and limitations?

2. Review approach

This is a narrative review, not a systematic review. Sources were located through targeted searches of publisher, repository and government websites in October 2026, using terms such as "mobile apps tourism India", "m-tourism India", "IRCTC app adoption", "Digi Yatra", "UPI statistics" and "India tourism statistics". Priority was given to: (a). peer-reviewed studies on tourism or travel apps in India or of general theoretical relevance; (b). official Ministry of Tourism releases and parliamentary replies; and (c). data from the payments regulator's ecosystem as reported by established business media. Preprints and trade reports are used sparingly and are labelled as such. DOIs are given where they were confirmed on a publisher, repository or indexing page; where none was found, the reference says so. No formal quality scoring, PRISMA flow or exhaustive database search was performed, so the review may miss relevant work and conclusions should be read as an evidence-informed synthesis.

3. The Indian tourism landscape that apps serve

3.1 Scale and recovery

Tourism in India is dominated by domestic travel. The Ministry of Tourism reports 29,481.91 lakh (about 2,948 million) domestic tourist visits (DTVs) and 99.52 lakh (9.95 million) foreign tourist arrivals (FTAs) in calendar 2024, with foreign exchange earnings of ₹2,93,033 crore [1]. FTAs fell sharply during the pandemic and have recovered to near the 2019 level of 10.93 million [7, 8]. Domestic visits recovered faster and reached new highs in 2023 and 2024 [2]. Table 1 and Figures 1 and 2 summarise the trends.

Table 1. Key Indian tourism indicators, 2019–2024.

Year	FTAs (million)	DTVs (million)	Foreign exchange earnings (₹ crore) / notes
2019	10.93	n/a in sources used	2,16,467 [7]
2020	2.74	610.2	50,136 [7]; pandemic year
2021	1.53	677.6	Not compiled here
2022	6.44 (revised)	1,731.0	Initial release was 6.19 million [9]
2023	9.52	2,508.8	DTV later revised; FTA +47.9% over 2022 [8]
2024	9.95	2,948.2	2,93,033 (revised estimate) [1]

Sources: [1, 2, 7, 8, 9]. FTAs count arrivals, whereas state-level foreign tourist visits (FTVs) count visits to states and are much larger; the two series should not be mixed [2].

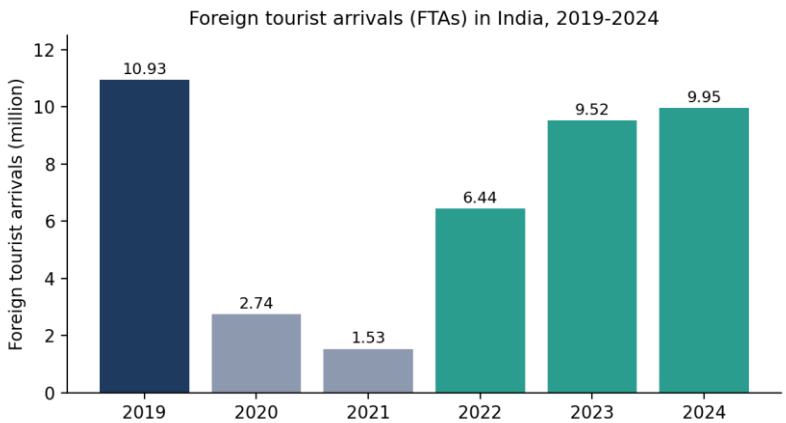


Figure 1. Foreign tourist arrivals in India, 2019–2024. Data: Ministry of Tourism and parliamentary replies [1,7,8,9].

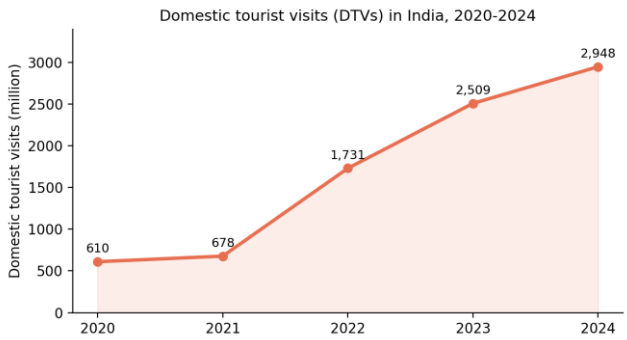


Figure 2. Domestic tourist visits in India, 2020–2024. Data: Ministry of Tourism series as compiled from [2].

The domestic-to-foreign ratio is striking: in 2024 there were roughly 296 domestic visits for every foreign arrival on these two series (although the series are counted differently). The design implication is that Indian tourism apps must primarily serve domestic users, many of whom travel for family, religious and leisure purposes, use vernacular languages and may be first-time digital buyers. An industry survey of 2,103 urban respondents reported that more than 60% used mobile apps for hotel booking and ticketing, and that payment, booking, social and navigation apps were the most sought after, though this is trade-reported rather than peer-reviewed evidence [10].

3.2 Digital enablers

Three enabling layers recur in the literature and policy reporting. First, affordable smartphones and mobile data, which a preprint on long-distance travel apps credits for rapid growth in app users, although its specific user estimates (about 220 million in 2021 rising above 800 million by 2023) are not peer reviewed and should be treated cautiously [11]. Second, digital payments: the Unified Payments Interface (UPI) handled 117.6 billion transactions in 2023, 172.2 billion in 2024 and 228.3 billion in 2025 [3], and 185.85 billion in FY2024–25 [12]. Third, digital identity and open services, such as Aadhaar-linked verification that Digi Yatra uses for registration [13]. Together these reduce friction in booking and payment, and they distinguish the Indian app ecosystem from many others.

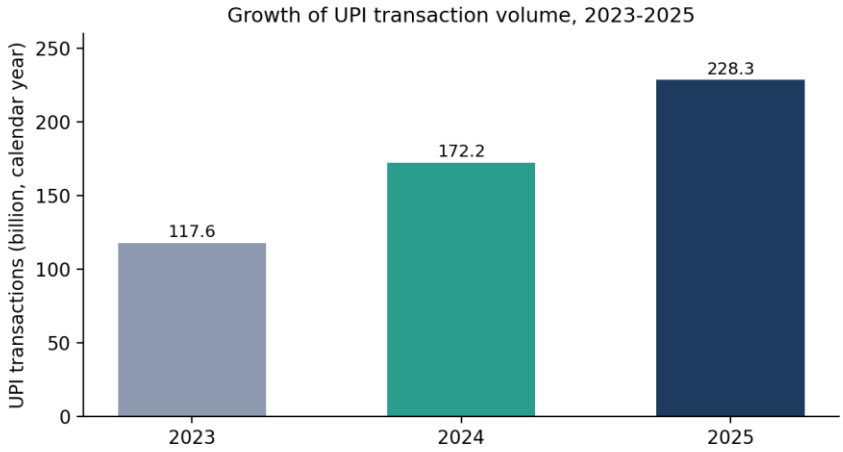


Figure 3. UPI transaction volume by calendar year. Data: NPCI figures as reported by Business Today [3].

4. The landscape of tourism apps in India

Tourism-relevant apps in India fall into several functional groups. Table 2 gives a working taxonomy. The examples are illustrative and non-exhaustive; inclusion does not imply ranking, and category membership is the author's synthesis informed by the cited literature.

Table 2. Working taxonomy of tourism-relevant mobile apps in India.

Category	Representative examples	Core functions	Evidence used here
Online travel agencies and aggregators	MakeMyTrip, Goibibo, ixigo, Cleartrip, EaseMyTrip, Yatra, Booking.com	Flights, hotels, buses, packages, price comparison, offers	General app-adoption studies [14, 15]
Rail and surface transport	IRCTC Rail Connect; state bus and ride-hailing apps	Reservation, cancellation, food ordering, live status	IRCTC adoption and UX studies [16, 17]
Airport and identity	Digi Yatra	Paperless, face-based boarding and checkpoint passage	Reporting and civil-society analysis [13, 18, 19]
Payments	UPI-enabled apps	Instant payments, QR acceptance by small merchants	NPCI data via media [3, 12]
Navigation and trip planning	Map and mobility apps	Route choice, departure time, mode choice, real-time information	Bhopal survey [20]
Government and destination apps	Incredible India content hub; state tourism apps; e-visa portal	Destination information, promotion, permits and visas	Parliamentary replies [8]
Stays and experiences	OYO, Airbnb, local-experience apps	Accommodation, local tours, creative tourism	Conceptual and cross-country work [5, 6]

Note: examples are named only as familiar illustrations of each category; no performance claim about any single commercial app is made.

4.1 IRCTC: The anchor government platform

The IRCTC platform illustrates both the promise and strain of app-based travel. A recent two-wave study using structural equation modelling reports that visibility, interactivity and persistence features improve user experience and are associated with higher perceived quality and loyalty, in a network serving more than 23 million passengers daily [17]. A survey of 193 Goan users using an extended UTAUT2 model found that habit, hedonic motivation, performance expectancy and perceived trust predicted behavioural intention and together explained 65% of its variance [16]. At the same time, analyses of public Google Play reviews compiled by a commercial review-analytics provider repeatedly flag glitches after updates, login failures and difficulty during high-demand Tatkal booking periods [21]. Such review analytics are anecdotal and not representative, but they point to reliability as a persistent concern.

4.2 Digi Yatra: Contactless identity at airports

Digi Yatra, introduced in December 2022, uses facial recognition and Aadhaar-based registration to allow paperless passage through airport checkpoints [13]. Reported user numbers rose from about one million in mid-2023 to nearly five million by April 2024 and over nine million in a later trade report [13, 18, 22]. These are reported milestones, not audited counts (Figure 4). Civil-society organisations such as the Internet Freedom Foundation have raised concerns about privacy, surveillance, exclusion errors and weak institutional accountability, while the operator has stated that data are encrypted and held on the user's device [13, 19].

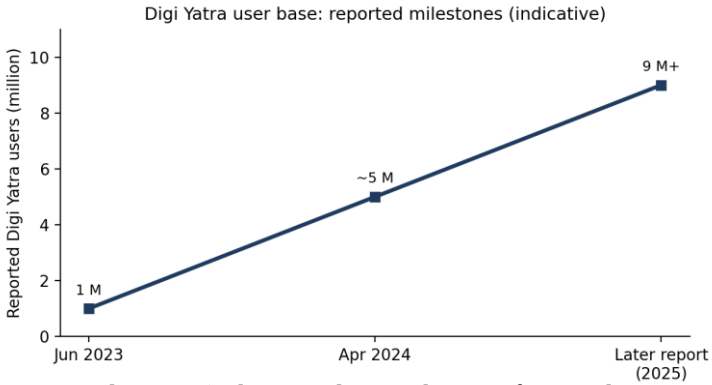


Figure 4. Reported Digi Yatra user milestones (indicative; dates and counts from trade reporting). Data: [13,18,22].

5. Evidence on adoption and use

Academic work on tourism apps in India mostly applies technology-acceptance frameworks. The Technology Acceptance Model emphasises perceived usefulness and ease of use [23], and UTAUT2 adds hedonic motivation, price value and habit for consumer contexts [24]. Indian studies typically extend these models with trust, cost and organisational variables. Table 3 summarises the main studies used in this review.

Table 3. Summary of selected studies relevant to tourism and travel apps in India.

Study	Context and design	Main finding	Ref.
Vinodan & Meera (2020)	M-tourism adoption; modelling of symbolic vs intended adoption	Identified factors shaping symbolic acceptance and intended adoption and tested their relationship; offers design guidance for developers	[14]
Chakraborty (2021)	182 respondents in Delhi, Kolkata, Mumbai, Chennai; multiple regression	Technological, organisational, environmental, perceived cost and perceived trust significantly affected app adoption	[15]
Goa IRCTC study (2022)	193 users; extended UTAUT2 with trust	Habit, hedonic motivation, performance expectancy and trust predicted intention; 65% variance explained	[16]
Sinha & Gupta (2023)	Survey of smartphone users in Bhopal	Links app use for trip planning with travel outcomes such as distance travelled and new-place visits	[20]
Bibliometric review (2024)	56 Scopus articles, 2013–2023	Apps extend beyond traveller behaviour to destination management and sustainability	[25]
IRCTC affordance study (2026)	Two-wave survey; SEM	Visibility, interactivity and persistence improve UX, quality perception and loyalty	[17]
Long-distance travel preprint (2025)	Mixed methods, secondary data; not peer reviewed	Rapid user growth; gaps in reliability, universal design, multilingual support and eco-options	[11]
Dickinson et al. (2014)	Review of smartphone apps in domestic travel (non-India)	Apps mediate travel and may enable collaborative, sustainable travel decisions	[5]

Taken together, the evidence suggests that performance expectancy, trust and habit matter more than novelty for utilitarian apps such as IRCTC, whereas organisational and cost considerations matter for business adoption. The evidence is, however, dominated by cross-sectional surveys with modest samples from particular cities.

6. Advantages of tourism apps in India

The advantages reported or implied by the evidence are summarised in Table 4 and in the benefits side of the conceptual model in Figure 5.

Table 4. Advantages of tourism apps in the Indian context.

Advantage	Evidence and explanation	Ref.
Convenience and disintermediation	Travellers can search, compare, book and cancel without agents; more than 60% of surveyed urban respondents used apps for hotel and ticket booking	[5, 10]
Integrated digital payments	UPI's scale (228.3 billion transactions in 2025) lets apps and small merchants accept instant, low-friction payment	[3, 12]
Contactless, faster processing	Digi Yatra enables face-based passage at participating airports, reducing document checks	[13, 18]
Real-time information and better planning	Trip-planning apps support decisions on departure time, mode and route and are linked to travel outcomes	[5, 20]
Reach for destinations and promoters	Government channels such as the Incredible India content hub and e-visa processes extend promotion and facilitation	[8]
Data for destination management	App-generated data can support smart destination planning and personalised services	[4, 6]
Sustainability potential	Apps may promote responsible behaviours, cultural engagement and lower-impact travel choices	[5, 25]

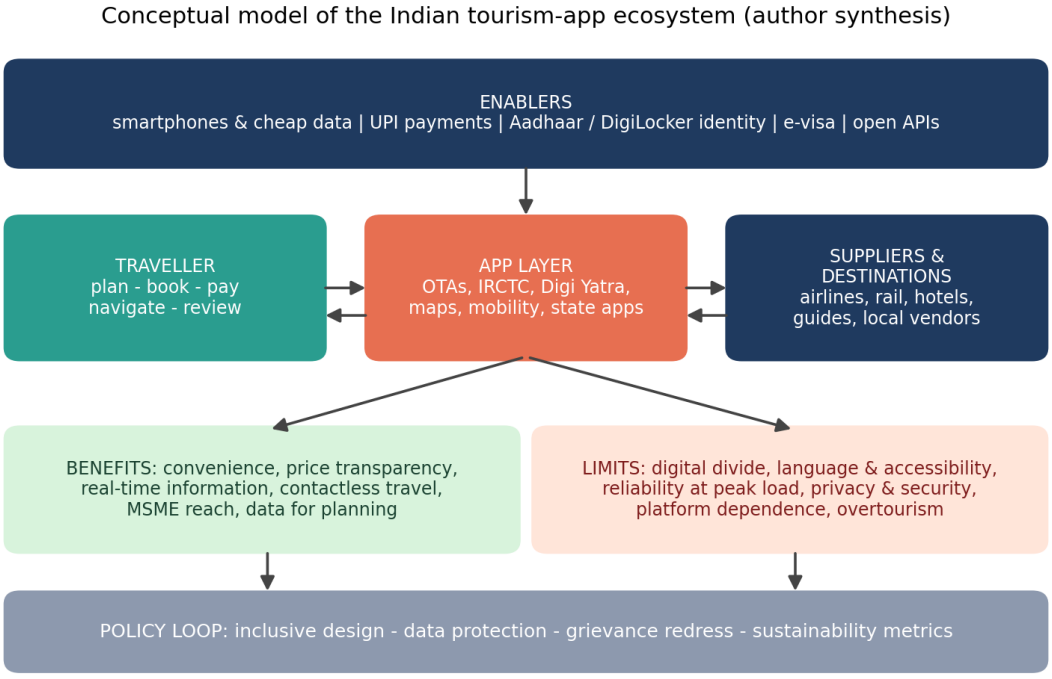


Figure 5. Conceptual model of the Indian tourism-app ecosystem showing enablers, actors, benefits, limits and the policy feedback loop (author synthesis).

7. Limitations and risks

Limitations arise from technology, institutions, users and the research base itself (Table 5).

Table 5. Limitations of tourism apps in India and of the evidence base.

Limitation	Evidence and explanation	Ref.
Reliability at peak demand	Public reviews of IRCTC Rail Connect report glitches after updates, login problems and Tatkal-time failures; reviews are anecdotal but recurrent	[11, 21]
Privacy and surveillance	Face-based systems such as Digi Yatra raise concerns about biometric data, consent, governance and exclusion errors; operator states data are encrypted and device-held	[13, 19, 22]
Digital divide, language and accessibility	Rapid adoption coexists with gaps in universal design and multilingual support; survey studies are concentrated in urban, smartphone-owning samples	[11, 20]
Trust and perceived cost	Trust and cost significantly influence adoption; lack of trust deters first-time and rural users	[15, 16]
Platform dependence and fragmentation	Reliance on a few large platforms and many separate state apps can fragment user experience and raise supplier dependence (conceptual concern from smart-tourism literature)	[4, 6]
Environmental and overtourism pressure	Easier booking and promotion can concentrate visitors; sustainability benefits are potential, not guaranteed	[5, 25]
Thin and uneven evidence	Mostly cross-sectional, city-specific, self-reported samples; few studies of foreign tourists, rural users or destination-level outcomes; some figures come from preprints or trade sources	[11, 20, 25]
Statistical inconsistency	FTAs, FTVs and DTVs are counted differently and are revised over time, complicating comparisons	[2, 9]

A practical implication is that reliability engineering (queue management, graceful degradation), explicit data-protection safeguards and accessible design are not optional extras. They determine whether the convenience benefits are broadly shared or concentrated among already digitally advantaged travellers.

8. Discussion

Indian tourism apps benefit from an unusually strong public digital backbone. UPI in particular has made payment a solved problem for many transactions, shifting competitive attention to discovery, service quality and trust. Yet the same concentration creates systemic risk: when a single national platform or identity system underperforms, large numbers of travellers are affected. Figure 6 offers an illustrative, qualitative appraisal of five categories across five dimensions. The scores are the author's judgement based on the literature cited and are intended to structure discussion, not to be read as measurements.

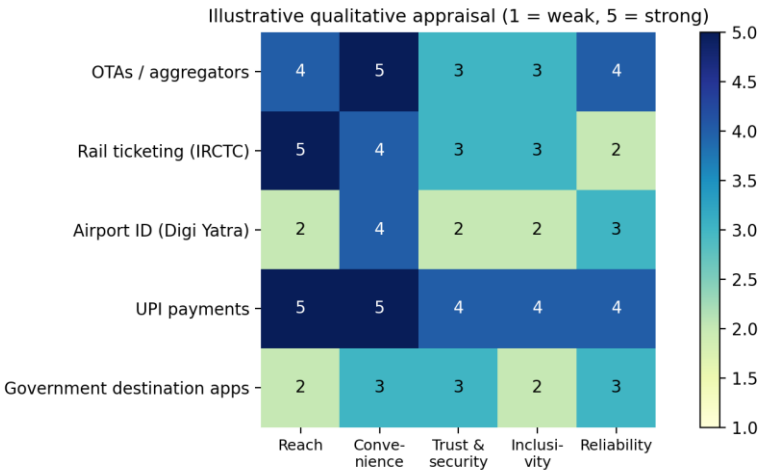


Figure 6. Illustrative qualitative appraisal of app categories (1 = weak, 5 = strong). Author judgement informed by the cited literature; not empirical measurements.

Two themes deserve emphasis. First, domestic dominance means that vernacular interfaces, low-bandwidth modes, voice and assisted use matter more than in inbound-oriented markets. Second, the benefits claimed for sustainability and destination management are largely conceptual and need empirical testing with destination-level data.

9. Research gaps and recommendations

- **Evidence:** Longitudinal and multi-city studies, including rural, older and non-English-speaking travellers, and research on foreign tourists' use of Indian apps.
- **Outcomes:** Studies linking app use to destination-level outcomes such as spending distribution, local MSME income, crowding and emissions.
- **Design:** Multilingual, accessible and low-bandwidth design standards for public and private apps, with usability audits.
- **Resilience:** Transparent reliability targets and incident reporting for high-demand platforms.
- **Governance:** Clear consent, retention and grievance mechanisms for biometric and identity-linked travel services.
- **Data:** Harmonised, openly documented tourism statistics so that arrivals, visits and revisions can be reconciled.

10. Conclusions

Mobile apps have become core infrastructure for Indian tourism, supported by exceptional digital payment adoption and large domestic demand. Documented advantages include convenience, payment integration, contactless processing and better information. Documented or plausible limitations include reliability under load, privacy risk, accessibility gaps, trust and cost barriers, and an evidence base that is still thin. The most productive agenda is to pair continued innovation with inclusive design, accountable data governance and rigorous destination-level evaluation.

Declarations

1. Use of Artificial Intelligence (AI) Tools: AI-assisted tools were used during the preparation of this manuscript to support the organisation of information, development of the manuscript structure, language refinement and improvement of presentation. The authors critically reviewed, edited, and verified the content and take full responsibility for the accuracy, originality, scientific integrity, and final content of the manuscript. AI tools were not considered substitutes for scholarly judgement, independent critical analysis or verification of sources.

2. Funding Declaration: The authors received no financial support, grants or other external funding from any government, private, commercial or non-profit organisation for the preparation and publication of this manuscript.

3. Conflict of Interest: The author declares no financial, personal, professional or institutional conflicts of interest that could have influenced the preparation, interpretation or presentation of this review.

4. Ethical Approval: Ethical approval was not required for this study because it is a narrative review based on previously published literature and publicly available information. No human participants, animals or identifiable personal data were involved.

5. Informed Consent: Not applicable. This manuscript does not involve human participants or the collection of primary data requiring informed consent.

6. Data Availability Statement: No new datasets were generated or analysed during this study. The information discussed in this review is derived from previously published literature, publicly available reports and other relevant secondary sources [Statistics were taken from official Ministry of Tourism releases, parliamentary replies and established media reports of NPCI data; later revisions may differ. Reported Digi Yatra user counts, preprint estimates and review-analytics findings are of lower evidential strength and are labelled accordingly. Figures 1–4 plot values are stated in the cited sources].

7. Author Contributions: Author contributed to the conceptualisation, literature review, analysis, interpretation and preparation of the manuscript. The author reviewed and revised the manuscript and approved the final version for publication.

Acknowledgements

The authors sincerely acknowledge the researchers, scholars, tourism professionals, policymakers, and various governmental and non-governmental organisations whose published studies, reports, and digital resources have contributed valuable information to the understanding of mobile applications in the Indian tourism industry. Special acknowledgement is extended to the Ministry of Tourism, Government of India, and relevant tourism and technology organisations for making information on India's tourism development, digital initiatives, and technological advancements publicly accessible. The authors also appreciate the academic and institutional support received during the conceptualisation and preparation of this narrative review.

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