

American Journal of Economics and Business Management

Vol. 9 Issue 10 | **pp.** 919-926 | **ISSN:** 2576-5973
Available online @ https://www.globalresearchnetwork.us/index.php/ajebm

Article

Artificial Intelligence as a Driver of Tourism Development in Uzbekistan

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Abstract: Uzbekistan received 10.3 million foreign visitors in the first nine months of 2026, 20.4% more than a year earlier, and earned USD 5.3 billion from tourism service exports, up 51.2% on the comparable period of 2025. Growth of this speed is good news, but it is also a warning: the country's service infrastructure is being asked to absorb volumes it was never built for. This article asks a practical question — how should artificial intelligence (AI) be introduced into the tourism sector so that quality keeps pace with quantity? Drawing on the service quality literature and on recent work concerning AI acceptance in hospitality, we propose a four-stage adoption model: digitalisation, a data ecosystem with predictive analytics, intelligent customer engagement, and finally an autonomous city-level tourism ecosystem. We then show, using Samarkand as a case, how the classic SERVQUAL-AHP weighting scheme can be merged with AI-driven sentiment monitoring so that the Gap 1 misalignment between what managers believe customers want and what customers actually say is tracked daily rather than once a year. Benchmarking against Dubai, Singapore, and Spain suggests the model is realistic provided staff training begins before, not after, deployment. Under a conservative reading, properly phased AI adoption could lift service quality indicators by a quarter to a third and protect export growth as the market approaches saturation in proximate source countries.

Keywords: artificial intelligence; tourism; service quality; SERVQUAL; analytic hierarchy process; dynamic pricing; recommender systems; Uzbekistan; Samarkand.

Citation: Akbarovich, R. O. Artificial Intelligence as a Driver of Tourism Development in Uzbekistan. American Journal of Economics and Business Management 2026, 9(10), 919-926.

Received: 19th Jul 2026
Revised: 24th Aug 2026
Accepted: 18th Sep 2026
Published: 21st Oct 2026

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1. Introduction

Few industries felt the digital shift as directly as tourism. A traveller today compares hotels, tour operators and even whole countries on a phone screen, and the comparison rarely stops at price. Service quality, personalisation and the sheer convenience of the digital journey decide where the booking button is pressed [1]. For Uzbekistan the stakes have risen very quickly. Between January and September 2026 the country welcomed 10.3 million foreign visitors — 20.4% above the same months of 2025 — and September alone accounted for 1.2 million of them. Earnings followed the same curve: tourism service exports reached USD 5.3 billion, a 51.2% jump year on year.

Looked at market by market, the picture becomes more interesting. Arrivals from China grew 2.1-fold, from Malaysia 1.9-fold, from Egypt and Romania 1.8-fold, from Indonesia 1.7-fold, from Japan 1.5-fold, from the United States 1.4-fold and from Russia 1.3-fold [2]. Germany and the United Kingdom each sent roughly a quarter more visitors than before, France 21% more, Türkiye 15% more. Two things follow. First, growth is

spreading from the familiar proximate markets — Russia, Türkiye — toward long-haul destinations in Europe and East Asia. Second, export value is growing about twice as fast as arrivals, which tells us the average visitor is spending more per trip. Both developments reward quality and punish its absence.

That last point deserves emphasis, because the historical record is unkind to countries that ignore it. When China's hotel capacity expanded faster than its service culture in the 1980s, visitors kept coming but satisfaction fell, and the government eventually had to impose classification standards in 1988 to stop the damage [3]. Algeria's more recent experience with tourism growth reads almost the same way: promising demand, undertrained staff, standards below international benchmarks. The lesson generalises. Unless service quality is managed deliberately, demand growth converts into reputational loss rather than revenue.

The past five years have produced a dense stream of studies on AI in hospitality and tourism, and a few findings recur often enough to be treated as reliable. People resist AI-mediated service mainly when they do not trust it or cannot see its benefit; presence of a human fallback and a legible interface reduce that resistance considerably [4]. Recommender systems, when they are accurate, move real money: recommendation quality is linked directly to booking conversion [5]. Chatbots are accepted for routine tasks, but their perceived value drops sharply the moment a conversation becomes emotional or non-standard [6]. Metaverse and virtual-heritage products, somewhat surprisingly, tend to complement rather than cannibalise physical visits. And automation reshapes jobs faster than it eliminates them, which makes retraining a policy variable rather than an afterthought.

We draw three working conclusions from this literature. Trust is the binding constraint, so hybrid human–AI designs beat pure automation. Personalisation and dynamic pricing are where returns arrive first. And the deployment question is never only technological — it is organisational.

Service quality remains anchored in the PZB gap model [7]. Its five dimensions — tangibles, reliability, responsiveness, assurance, empathy — were operationalised in the SERVQUAL scale. What AI changes is not the dimensions but their measurement and their division of labour. Mechanical services (information, booking, queue handling) automate well; emotional services (reassurance, exception handling) do not. Curiously, this raises rather than lowers the market value of the human dimensions: as more of the transaction becomes automated, the moments that remain human carry more weight [8]. A sensible automation strategy therefore automates responsiveness heavily and assurance barely at all.

The classic SERVQUAL instrument, however, is static and weak at weighting. Pairing it with the Analytic Hierarchy Process fixes part of this: expert judgements collected through pairwise comparisons, validated by a consistency ratio under 10%, yield numerical weights. Fuzzy SERVQUAL methods apply the same logic to the evaluation of hotel service quality. A fuzzy AHP built on SERVQUAL has been used for hotel service quality management in Vietnam. Together, these instruments make the Gap 1 misalignment between managerial perception and customer expectation measurable. What neither instrument can do is watch quality daily. That is where sentiment analysis enters: reviews from Google, TripAdvisor and Booking, classified by criterion, allow dimension-level indices to be refreshed continuously. We are not aware of a published scheme that fuses AHP-SERVQUAL weights with real-time sentiment monitoring, and building one is the methodological contribution of this article.

This article therefore pursues three objectives. We first read the 2026 statistics closely and derive what they imply for where attention should go. We then set out a four-stage model for adopting AI in tourism, arguing that sequencing matters more than speed. Finally, we translate the model into an operational scheme for Samarkand, where heritage

pressure is most acute, and we spell out the institutional and financial groundwork without which any such scheme remains a slide deck.

Four questions structure what follows. What does the 2026 growth profile imply for prioritisation? Through which stages should AI adoption proceed, and why does sequence matter? Which SERVQUAL dimensions gain most from automation? And what would a working hybrid scheme look like in Samarkand?

2. Materials and Method

The study combines a conceptual model with a single illustrative case. Three data sources are used. The first is official 2026 statistics: 10.3 million arrivals for January–September, +20.4%; 1.2 million in September alone; growth coefficients by source country (China 2.1×, Malaysia 1.9×, Egypt and Romania 1.8×, Indonesia 1.7×, Japan 1.5×, USA 1.4×, Russia 1.3×; Germany and the UK above +25%; France +21%; Türkiye +15%); and USD 5.3 billion of tourism service exports, +51.2% year on year. The second is the research literature reviewed above. The third is the methodological scheme of the Algerian AHP-SERVQUAL study, adapted here to Uzbek conditions, together with open programme documents from Dubai, Singapore and Spain used for benchmarking.

Analytically we rely on descriptive statistics, comparative reading by source market, staged evolutionary modelling, and a qualitative investment appraisal. Wherever a number is our estimate rather than an official figure, we say so. Two limitations frame everything that follows: the evidence is macro-statistical, and hotel-level fieldwork is planned but not yet completed; and the international descriptions are documentary rather than ethnographic. We flag these limits again where they bite.

3. Results

Three features of the 2026 data matter for policy. Growth is stratified: the national figure of 20.4% conceals a range from 1.3× (Russia) to 2.1× (China) across source markets (Table 1). Proximate markets are decelerating into saturation while long-haul markets still have slope. Export value grows twice as fast as arrivals, so the marginal visitor is richer than the average one — exactly the profile that pays for quality [9]. And the Asia-Pacific weight of the growth (China, Malaysia, Indonesia, Japan all above 1.5×) concentrates pressure on heritage cities, Samarkand above all.

Table 1. Arrivals growth by source market and its AI segmentation reading

Source market	Growth	Reading of the segment	AI implication
China	2.1×	Fastest mass-market expansion	Chinese-language chatbots; WeChat mini-apps; Alipay acceptance
Malaysia	1.9×	Muslim-friendly travel	Halal-service index; Malay interfaces
Egypt, Romania	1.8×	Travellers from heritage-rich states	Strong demand for AR heritage experiences
Indonesia	1.7×	Young, mobile-first generation	App-first service design
Japan	1.5×	High-spend travellers	Precision, safety, cleanliness signals
USA	1.4×	Premium segment	English AI concierge; long-horizon planning tools
Russia	1.3×	Traditional proximate market	Saturation — retention and quality decide
Germany, UK	>+25%	Long-haul Europe	Eco-tourism; in-depth AI itinerary planning

Source market	Growth	Reading of the segment	AI implication
France	+21%	Culture-oriented travel	Art-and-culture recommender systems
Türkiye	+15%	Proximate market	Fare-linked dynamic pricing

Projecting the trend mechanically, annual arrivals could reach 13–14 million by end-2026. At that scale, manual service processes — booking, transport dispatch, guiding, complaint handling — saturate quickly [10]. AI's role here is compensatory: the flow grows without a proportional growth in headcount, because each employee's capacity is augmented rather than replaced.

Our central proposal is that AI should enter the tourism sector in four sequenced stages. Each stage is the data foundation of the next; skipping one produces systems that mispredict because they were fed poorly [11]. The sequence matters more than the speed.

Stage one — digitalisation. Everything begins with capture. Every customer touchpoint — website, app, telephone, reception, social media — must become a digital channel, and the outputs must land in one place: a data lake fed by web analytics, a CRM, API-connected booking engines, electronic payments (Payme, Click, Uzcard and international cards), and, around the great monuments, camera- and sensor-based flow monitoring. No AI runs at this stage, and that is fine. What matters is that the raw material of every later model — structured, cleaned, labelled data — actually exists. Management changes too: data engineers and analysts appear on the payroll. Realistic expectations: 80% or more of customer interactions captured digitally, operating costs down 10–15%, complaint-handling time cut by roughly 40%. Samarkand is most of the way through this stage; hotels are connected to booking platforms, but the data still sit in silos. That silo problem, not hardware, is the binding constraint.

Stage two — the data ecosystem and prediction. Once data flow, models follow: arrival forecasts by country, season and event calendar; dynamic price recommendations; staff roster optimisation; food and consumables forecasting. The toolkit is conventional — gradient boosting, ARIMA/Prophet, modest neural networks — and that is a virtue, because interpretable models can be argued with in a management meeting. One design choice we insist on matters for the quality literature: dynamic pricing models should take AHP weights as exogenous inputs, so that segment-level criterion weights feed price elasticity. The Japanese heritage enthusiast, whose price sensitivity is low but whose weight on service detail is high, should see a different price path from the budget traveller from a proximate market. Expectations: occupancy up 5–8 percentage points, marketing spend 20% more efficient, food waste down around 15%.

Stage three — intelligent engagement. Only now does the customer meet the machine directly. Multilingual chatbots — Uzbek, Russian, English, Chinese, Arabic, Korean, matched to the arrival mix — handle routine requests around the clock. Recommender systems assemble itineraries [12]. Sentiment analysis reads reviews continuously and flags hidden deterioration. Real-time AI interpretation supports guides rather than replacing them. This is also where the SERVQUAL dimensions fuse with AI: an empathy proxy from sentiment indices, a reliability proxy from booking-guarantee models, a responsiveness proxy from measured response time. Consistent with the acceptance evidence reviewed above, we recommend keeping a human in the loop: the bot resolves the ordinary, the moment a conversation turns emotional or unusual it hands over to a person. Expected effects — satisfaction up 8–12 points, repeat bookings rising, 24/7 service at no extra staffing cost — are plausible rather than guaranteed [13].

Stage four — the autonomous ecosystem. The final stage is city-scale. Transport flows, a digital visitor identity, AR guides with real-time translation and historical reconstruction, dynamic allocation of guides, museum slots and restaurant tables — and, at peak times, city-level steering that redirects visitors away from saturated sites. Many

decisions here pass from people to algorithms: a predicted surge triggers extra transport automatically; museum entry slots are smoothed by forecast. In service-dominant-logic terms, value is now produced in real time through resource exchange [14]. The governance cost is real and should be stated plainly: algorithmic audits, an AI ethics council, data-sharing agreements among city, businesses and platforms. Expect a single city-wide satisfaction index, stable quality in peak season, and the ability to prototype a new product — say, an AR tour package — in weeks rather than seasons.

Table 2. The four-stage model summarized

Stage	Period	Core technologies	Expected impact
1. Digitalisation	2026–2027	CRM, APIs, e-payments, data lake	Costs −10–15%; data coverage >80%
2. Prediction	2027–2028	ML forecasting, dynamic pricing, roster optimisation	Occupancy +5–8 p.p.; marketing +20%
3. Engagement	2028–2029	Chatbots, recommenders, sentiment analysis	Satisfaction +8–12 p.p.; 24/7 service
4. Autonomy	2029–2031	AR guides, city APIs, algorithmic allocation	Stable peak quality; fast product innovation

The scheme we propose for Samarkand has three layers. First, the nineteen selection criteria from the Algerian study — distributed across the five SERVQUAL dimensions — are re-weighted at least twice a year through pairwise comparisons run separately with managers and customers, with consistency ratios below 10%. Second, a sentiment engine computes daily indices per criterion from Google, TripAdvisor and Booking reviews. Third, the two are merged into a live gap indicator: Gap_1(day) = W_manager(criterion) − W_customer_sentiment(criterion, day). The arithmetic is deliberately simple so that a hotel revenue manager can interrogate it.

Two illustrations show why this is useful. In the Algerian data the largest single misalignment concerned staff courtesy: customers weighted it first, managers weighted it second-to-last, a gap of −0.101. If Samarkand's sentiment stream shows the same shape, the system flags it early and training budget follows the flag. The opposite signal matters too: managers weighting 'easy access' far above customers is an overinvestment warning — for the new hotels crowding around Registan, location should be monetised through pricing, not defended with further spending. A four-hotel pilot — two international brands, one large local property, one boutique — running semester-long monitoring would tell us quickly whether the scheme travels. If it does, its indicators belong in the criteria block of a national Tourism Quality-2030 programme.

4. Discussion

Three benchmark cases discipline our optimism. Dubai built an AI-centred tourism stack by state decree — biometric borders, personal AI concierges, a live city dashboard — and then discovered that quality stability depended on staff competence, which is why its tourism academy was re-equipped with AI modules. Singapore scaled quickly because a small territory and digitally literate population let pilots propagate; its lesson for Uzbekistan is that our equivalents of those advantages are a young population and an already habitual mobile-payments market [15]. Spain, the heritage-digitalisation leader, learned the harder lesson: at the Alhambra and Sagrada Família, AR and virtual reconstruction work only when paired with crowd control, otherwise the technology deepens the queue it was meant to relieve.

Three portable lessons follow. Public–private platforms are not optional — Dubai's airport and hotels run on one stack. Training precedes deployment, not the other way round. And at heritage sites, AI must arrive together with flow management.

Six opportunities stand out for Uzbekistan, most of them sharpest in Samarkand. Heritage AI: digitising and augmenting the Registan, Shah-i-Zinda, the Ulugh Beg Observatory and Afrasiab opens them to a global online audience and pre-sells the physical visit — the Spanish evidence says the virtual and the real complement each other [16]. The language bridge: multilingual assistants match the arrival mix exactly — WeChat mini-apps for the Chinese, precision-and-safety signalling for the Japanese, a visible halal index for Malaysians; this is the AI form of empathy. Continuous quality monitoring: where SERVQUAL surveys run annually, sentiment analysis reads thousands of opinions daily, and Gap 1 becomes a daily indicator rather than an annual surprise. Staff leverage: automation removes mechanical tasks and returns employee time to the human dimensions — the cheapest available fix for exactly the gaps that hurt most in the Algerian data, staff courtesy and security. A public–private data bank: pooling statistics, hotel and platform data grounds policy in signal and seeds a data economy. And export diversification: AI-specific products — virtual tours, subscriptions, licensed AR content — can add a high-margin line to a USD 5.3 billion export that today is almost entirely services [17].

Four risks deserve equal billing with the opportunities. Data protection: a digital profile is convenient until it leaks, and with German and British arrivals up by a quarter, GDPR-grade expectations arrive with the passengers. Error propagation: one faulty model can mislead hundreds of properties simultaneously, so every model passes a human-reviewed dry run before it advises anyone. The digital divide: family hotels and guesthouses cannot fund AI alone, and a subsidised AI-as-a-Service tier — Singapore has one — is the obvious remedy. Labour displacement: mechanical roles shrink faster than new ones appear, so retraining belongs inside the policy, not outside it. Mitigation is conventional but must be written down: an ethics code, a model-audit committee, human-in-the-loop clauses in operating procedures, and encouragement of ISO 27001 and GDPR-type certification for exporters.

Three institutions make the scheme durable. A tourism AI laboratory, run as a university–industry consortium under the ministry, owns calibration, training and benchmarking. A digital visitor identity, adopted at city level, lets one QR code carry the tourist across transport, museums and hotels. And an AI-readiness rating — one to three stars — gives the market a signal hotels will actually chase. Twinning arrangements with the Dubai and Singapore academies would shorten the learning curve considerably.

The cost curve is friendlier than the rhetoric suggests. Stage one is mostly subscriptions and integration — USD 15–30 thousand per hotel on average. Stage two adds infrastructure and two or three data specialists — USD 50–100 thousand a year. Stage three is licensing — USD 20–50 thousand a year. Stage four is the expensive one, city-scale infrastructure in the millions, but it is precisely the layer that public–private partnership and international grants exist to fund. Even conservatively, stages two and three pay back in two to three years on pricing and occupancy gains alone. For small properties, the as-a-service tier cuts entry costs tenfold; a state-subsidised first year is cheap industrial policy.

Government should map a Digital Tourism-2030 programme onto the four stages, each with its own financing instrument; move statistics to real time, because monthly reports cannot steer flows; align national data-protection standards with GDPR-type rules, since the export market will demand it anyway; and make AI-in-tourism a compulsory module in tourism education. Business should start stage one now — after 2027 the gap to competitors becomes structural; rent rather than buy where possible; publish the transparency policy alongside dynamic pricing, because hidden price movement corrodes exactly the sentiment the system measures; and put the gap indicator on the monthly management agenda. Academia should fuse tourism and IT curricula, run exchange

programmes with Dubai and Singapore, and build Uzbek-language NLP, since global chatbots stumble on the language's flexible word order — a genuinely open research problem.

The contribution is threefold. The model unifies processes the literature describes piecemeal into one sequenced framework with explicit dependencies, and it is stated sharply enough to be tested. The method fuses AHP-SERVQUAL weights with continuous sentiment monitoring, moving Gap 1 from annual to daily resolution. And the calibration connects a real statistical profile — 10.3 million arrivals, 1.3×–2.1× growth across markets — to concrete segmentation choices. What the article does not do is equally clear: there is as yet no hotel-level fieldwork behind the Samarkand numbers, the international cases are documentary rather than ethnographic, and the financial figures are planning estimates awaiting pilot confirmation. Those gaps define the research agenda — empirical surveys in Samarkand, Bukhara and Tashkent in 2027, a longitudinal acceptance study in 2028, an econometric look at heritage-AI exports in 2029.

In the pessimistic scenario, only stage one happens and growth fades from 20.4% to 8–10% by 2030 as quality fails to hold volume; the USD 5.3 billion export plateaus. In the baseline, stages one and two land by 2030: exports reach USD 7.5–8 billion, growth holds near 15%, and employment shifts rather than shrinks. In the optimistic case, all four stages plus heritage-AI exports arrive together, exports pass USD 10 billion, and Uzbekistan becomes the region's digital tourism hub. The distance between the scenarios is several billion dollars, which is the strongest argument for treating AI investment as the highest-margin decision available to the sector. One caveat closes the section: the decisive variable in every scenario is people [18]. Technology installs in months; trust, habits and institutions take five to six years. Keep the technology strategy and the people strategy as one document, not two.

5. Conclusion

Uzbekistan's tourism industry has crossed a threshold. The 2026 figures — 10.3 million visitors, USD 5.3 billion in service exports — are an achievement and a warning in equal measure. Growth of this kind is retained only by quality, and quality at this speed is managed only with machines. We have argued that the machines should arrive in four stages, that the SERVQUAL dimensions survive the transition but change their instruments, and that a modest hybrid of AHP weights and daily sentiment indices can give Samarkand's hoteliers something they have never had: an early-warning system for misreading their customers. The heritage that draws the world to Samarkand will keep its pull for decades. Whether the service behind it earns the repeat visit is a question that will be answered in the next five years — and the answer will be written partly in code.

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