

ARTIFICIAL INTELLIGENCE AND TOURISM-DRIVEN ECONOMIC DEVELOPMENT IN ALBANIA

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Abstract: Albania recorded approximately 11.7 million foreign arrivals in 2024, a figure that places growing strain on infrastructure, management systems, and the natural environment. This paper examines how that tourism expansion is shaping the adoption of artificial intelligence across the sector, and what the resulting economic, environmental, and ethical consequences look like in practice. Drawing on a systematic review of academic literature published between 2019 and 2025, supplemented by secondary statistical data from INSTAT, Eurostat, and UN Tourism, we find that AI adoption is uneven: larger, urban-based businesses are realising tangible gains in efficiency and revenue, while rural SMEs continue to face significant barriers related to cost, connectivity, and skills. We argue that the question is no longer whether Albania should integrate AI into tourism, but how to do so in a way that preserves the human character of the sector.

Keywords: artificial intelligence, Albania, tourism, digital transformation, sustainable development

1 Introduction

Few places in Europe have seen the kind of tourism growth that Albania has managed over the last decade. From roughly 3.8 million foreign arrivals in 2015, the country reached an estimated 11.7 million in 2024, a 15.2% increase on the previous year alone (INSTAT, 2025). That number is startling when you consider that Albania has a resident population of around 2.8 million: the country receives, each year, nearly four times as many visitors as it has permanent inhabitants. The practical consequences are visible. During peak season, hotels, transport networks, and public services operate well beyond their designed capacity. Conventional management approaches, built for a different scale of demand, are no longer adequate (Ferhataj & Memaj, 2024).

The post-pandemic recovery in global travel has, if anything, made the situation more acute. Albania has benefited from a broader shift in tourist preferences towards less visited, more authentic destinations, and the country's combination of unspoiled coastline, mountain landscapes, and competitive prices has attracted attention from across Western Europe. Sustaining that appeal over time is not straightforward. It requires careful management of natural resources, cultural sites, and service quality, and it is in this context that artificial intelligence has begun to matter. AI is not just a tool for automating reservations; it is reshaping decisions about energy use in hotels, crowd management at heritage sites, and how operators anticipate and respond to demand (Samala et al., 2022). Serafimova and Vasilev (2024), writing in AIJES on organisational digital culture and sustainable development, show that digital culture is increasingly part of competitiveness, an insight that translates directly to tourism-heavy economies like Albania.

This paper asks, specifically, how the growth of tourism in Albania is driving AI adoption across the industry, and what the economic and sustainability implications of that

process are. The analysis draws on a systematic review of academic literature published between 2019 and 2025, together with official statistical data from INSTAT, Eurostat, and UN Tourism. Section 2 reviews the relevant literature. Section 3 sets out the methodology. Section 4 presents the results of the analysis, and Section 5 discusses the findings and practical recommendations.

2 Literature Review

AI and tourism have attracted growing academic attention since around 2019, when the volume of publications on the topic began to rise sharply (Knani et al., 2022). Most of that literature focuses on larger, well-established tourism markets. The Albanian case, and emerging Balkan economies more generally, remain underrepresented, which is one reason this paper is needed.

2.1 AI, Economic Efficiency and Visitor Experience

The economic rationale for AI adoption in tourism comes down to two things: automating what does not need human attention, and making better use of the data that the sector generates in large quantities. Reservation handling, customer queries, and itinerary generation are all areas where AI systems can take on the burden, freeing staff for the work that genuinely benefits from a personal touch (Samala et al., 2022). For Albanian hospitality SMEs, many of which operate on slim margins, even modest efficiency gains matter.

The evidence from within Albania is consistent with this picture. Godolja et al. (2025) found that hotels using digital management platforms reported measurable reductions in administrative burden and improvements in staff productivity. Demand forecasting tools are helping operators anticipate busy periods and price accordingly, reducing both waste and missed revenue opportunities (Choi & Kim, 2024). Chatbots, meanwhile, are extending service availability to 24 hours a day and removing language barriers that previously limited access to international visitors (Sousa et al., 2024).

Personalisation has become a core expectation among contemporary travellers, not just in premium segments but across the board. Tourists now routinely expect services that reflect their individual preferences, and AI makes it possible to meet that expectation at scale by drawing on data from booking histories, social media activity, and real-time feedback (Huang et al., 2022).

In Albania, one of the more instructive examples comes from Durrës. Research by Kosta et al. (2025) describes hotel recommendation platforms using Natural Language Processing and cosine similarity techniques to analyse guest reviews and refine service offerings accordingly. The commercial logic is clear: personalised services lead to higher guest satisfaction, larger per visit expenditure, and greater likelihood of return visits. Ferhataj (2024) goes further, suggesting that the most effective AI applications are those that generate experiences distinctive enough to become a reason in themselves for choosing a destination.

2.2 Sustainability, Ethics and Social Dimensions

Tourism growth and environmental protection are not straightforwardly compatible, and Albania's situation illustrates the tension well. The country's natural assets, including its Riviera coastline, national parks, and mountain ecosystems, are both the main draw for visitors and the things most at risk from poorly managed visitor pressure. AI offers several tools for managing this more intelligently.

Smart energy management in hotels is probably the most developed application: AI systems that monitor and regulate electricity and water consumption in real time can cut both costs and environmental impact (Godolja et al., 2025). Crowd prediction and visitor flow modelling allow authorities to anticipate bottlenecks at sensitive sites and suggest alternative

itineraries before problems escalate (Alrawadieh et al., 2025). Carbon accounting tools are emerging as a way of quantifying the environmental cost of different tourism patterns, giving policymakers something concrete to work with (López-Naranjo et al., 2025). The digitisation of heritage sites through virtual and augmented reality, meanwhile, offers a way of preserving access without the physical degradation that accompanies mass visitation.

AI in tourism is not without complications. Data privacy is the most immediate concern: AI systems depend on processing large quantities of personal data, and the legal and technical frameworks for protecting that data are, in many contexts, still catching up with the technology (Putera et al., 2022). For Albania, aligning with GDPR as part of the EU accession process is both a regulatory obligation and, done well, an opportunity to build the kind of trust that digital services require.

Algorithmic bias is a subtler but equally important problem. Systems trained on historical data can replicate and amplify existing patterns of discrimination if they are not carefully audited (Ma, 2024). And there is a broader question about what sustained AI adoption does to the character of hospitality. The warmth of a family-run guesthouse, the local knowledge of a guide who has lived in a place all their life: these are things that automated systems cannot replicate, and they are part of what makes Albanian tourism worth experiencing (Milton, 2023). Any serious strategy for AI integration needs to grapple with this.

3 Methodology

We used a systematic literature review as the primary methodology, supplemented by analysis of secondary statistical data. The choice reflects both the breadth of the research question and the relatively sparse literature on Albania specifically. Systematic reviews allow for a structured, transparent synthesis of what has been published, with explicit criteria for what is included and why.

3.1 Data Collection

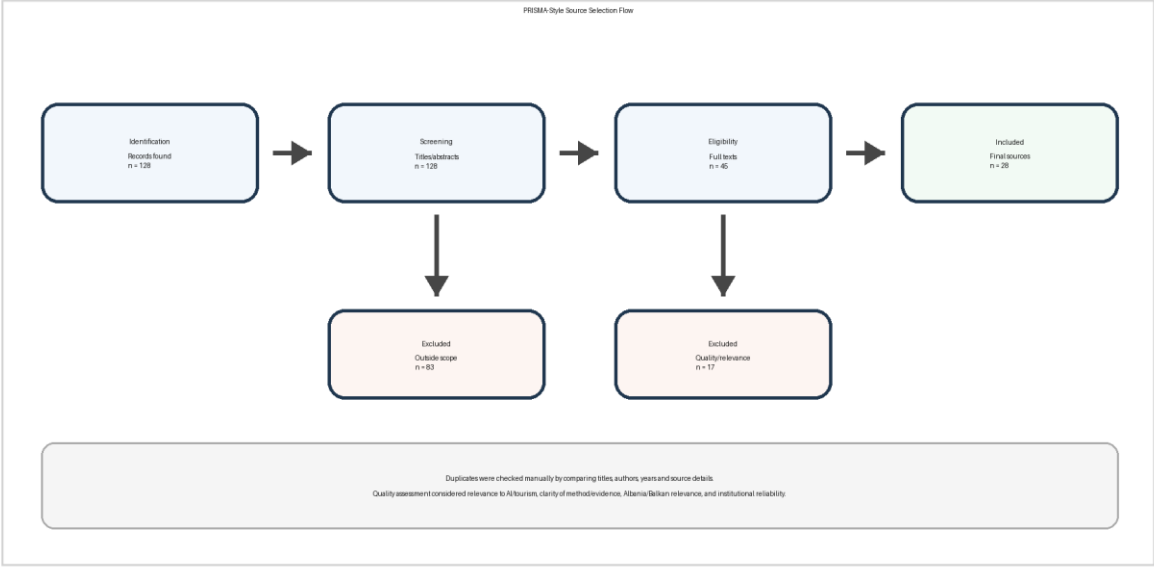
The literature search used Google Scholar, Scopus, and ResearchGate. Official statistical sources, namely INSTAT, Eurostat, and UN Tourism, were consulted to ground the analysis in verified empirical data on visitor trends and economic indicators. Search terms combined “artificial intelligence” or “AI” with “tourism” or “hospitality” and “Albania” or “Balkans,” supplemented by terms including “digital transformation,” “sustainable tourism,” and “tourism ethics.”

Inclusion required that sources be peer-reviewed articles, conference papers, or official reports from 2019 to 2025, with a clear focus on AI in tourism or hospitality and either empirical content or a well-developed theoretical framework. Studies without a socio-economic dimension, sources with insufficient methodological clarity, and papers that referred to tourism technology without addressing AI or digital transformation were excluded. Duplicate records were removed manually by comparing titles, authors, years of publication, and source details before the title-and-abstract screening stage. The screening was performed by the authors using the same inclusion and exclusion criteria; where a source was borderline, it was retained for full-text review rather than excluded at the first stage. An initial pool of 128 sources was screened by title and abstract; 45 proceeded to full-text review, of which 28 met the criteria for inclusion in the qualitative synthesis. The review process therefore followed a PRISMA-style logic: identification of sources, duplicate removal, screening for relevance, eligibility assessment, and thematic synthesis.

For quality assessment, each full-text source was checked against four simple criteria: direct relevance to AI and tourism, clarity of method or evidence base, relevance to Albania, the Balkans, or comparable tourism economies, and contribution to economic, sustainability,

ethical, or governance aspects of tourism development. This assessment was not intended as a meta-analysis, because the included studies used different methods and data types, but it helped ensure that the final synthesis relied on sources with clear relevance and sufficient academic or institutional reliability.

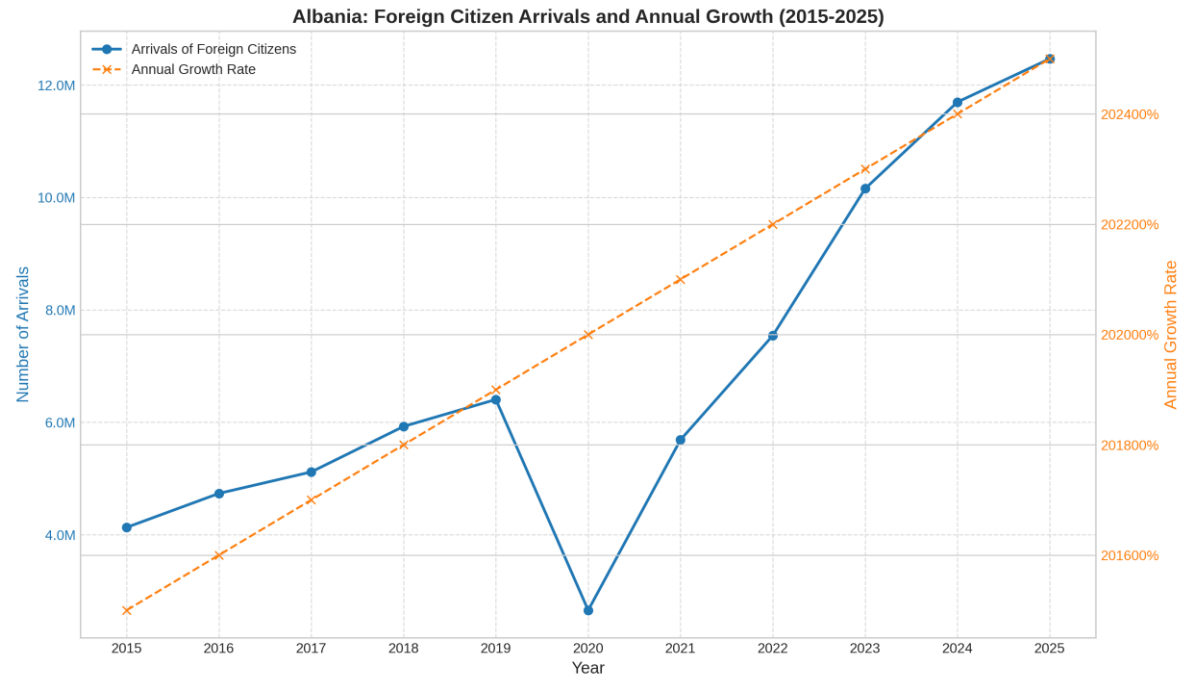
Figure 1. PRISMA-Style Flow of Source Selection



Source: Authors’ methodological summary.

Figure 2 shows Albania’s trajectory of foreign arrivals over the study period. The sharp contraction in 2020 reflects the COVID-19 pandemic; the subsequent recovery, and particularly the growth recorded between 2022 and 2024, provides the backdrop against which AI adoption pressures need to be understood.

Figure 2. Albania: Foreign Citizen Arrivals and Annual Growth Rate (2015–2025)



Source: Authors’ compilation based on INSTAT data (2025).

3.2 Thematic Analysis

The selected literature was analysed thematically, with patterns identified, coded, and grouped into four core themes: economic impacts and operational efficiency; personalisation and value creation; sustainability and environmental management; and ethical, social, and infrastructural challenges. Table 1 provides a quantitative summary of visitor trend data that underpins several of the thematic findings.

Table 1. *Albania: Foreign Citizen Arrivals, Annual Growth, and Tourism Contribution to GDP (2015–2024)*

Year	Foreign Arrivals (millions)	YoY Growth (%)	Tourism Share of GDP (%)
2015	3.8	n/a	6.2
2017	5.1	12.4	7.4
2019	6.4	11.7	8.9
2021	4.2	-34.4	5.1
2022	7.5	78.6	9.3
2023	10.2	36.0	11.7
2024	11.7	15.2	13.4

Source: Authors' compilation based on INSTAT (2025) and Eurostat (2022) data.

4 Results of AI Integration in Albanian Tourism

Taken together, the evidence points to something that might be described as a forced digitalisation: the volume of tourism growth has created operational pressures that traditional management approaches cannot absorb, and AI is increasingly filling the gap. That process is not uniform, however, and the differences between how it plays out in Tirana versus a rural guesthouse in the Accursed Mountains are significant.

The clearest economic gains from AI adoption appear in operational efficiency. Businesses using AI-driven booking systems, demand forecasting tools, or automated customer service report reduced administrative overhead and better use of staff time (Godolja et al., 2025). Table 2 summarises the main technologies in use across Albanian tourism and the economic functions they serve.

Table 2. *AI Applications and Economic Drivers in Albanian Tourism*

AI Technology	Application Area	Economic Driver
Machine Learning	Demand Forecasting	Optimised pricing and inventory management
NLP and Chatbots	Customer Service	Reduced costs and 24/7 multilingual support
Big Data Analytics	Personalisation	Increased visitor spending and repeat visits
Computer Vision	Security and Check-in	Faster processing and enhanced safety

Source: Adapted from Kosta et al. (2025) and Samala et al. (2022).

4.1 Economic Implications and Personalised Services

Automating repetitive, high-volume tasks frees up staff time and reduces error rates during peak periods. Research on Albanian accommodation providers found that AI-enabled management systems produced measurable productivity improvements and reduced the administrative burden on employees (Godolja et al., 2025). The financial logic holds even for modest operations: lower input costs for the same service output can be redirected toward marketing, product development, or simply improved working conditions.

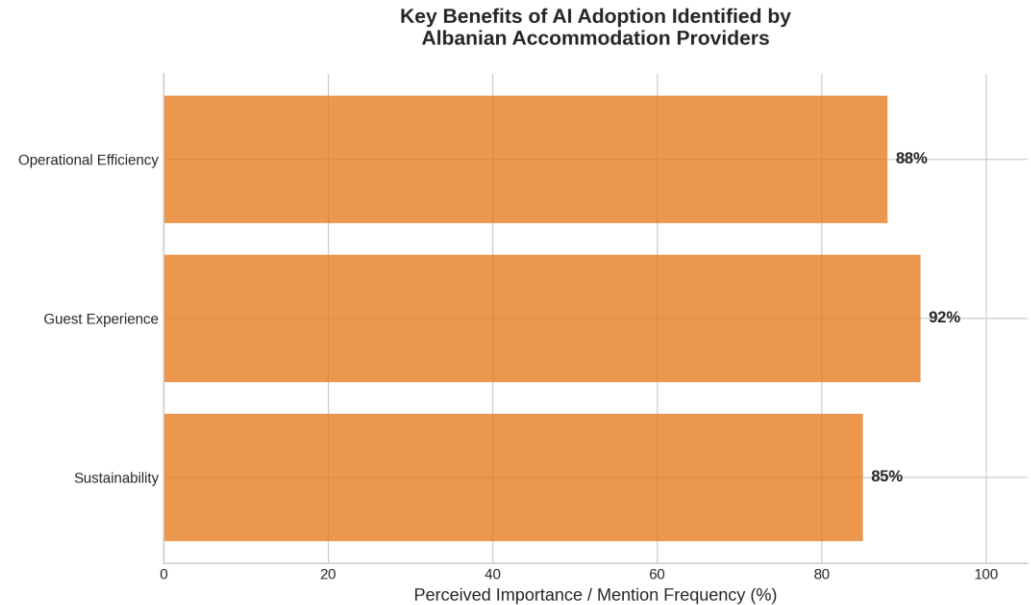
Not everyone benefits equally, though. The businesses with the most to gain from AI are also those with the resources to adopt it in the first place. This matters for how we think

about equitable development across the sector, because digital transformation can easily widen the gap between well-capitalised operators and smaller rural businesses (Sousa et al., 2024).

Personalised services tend to produce measurable revenue effects. When AI systems tailor accommodation recommendations or activity suggestions to individual preferences, guests typically spend more and report higher satisfaction, and satisfied guests come back and tell others (Choi & Kim, 2024). The Durres case documented by Kosta et al. (2025) illustrates this concretely: NLP-based review analysis allowed businesses to understand what visitors actually valued in ways that manual feedback monitoring could not replicate at scale.

Figure 3 captures the picture from the supply side. Survey data from Albanian accommodation providers indicates that improving the guest experience was the most commonly cited benefit of AI adoption, followed by gains in operational efficiency and, notably, sustainability outcomes. This ordering is worth noting: guest experience ranked above cost savings, which suggests that providers understand personalisation as a competitive priority, not just an operational convenience.

Figure 3. *Key Benefits of AI Adoption Identified by Albanian Accommodation Providers*



Source: Adapted from Godolja et al. (2025).

4.2 Sustainability, Barriers and Governance

Albania's natural and cultural heritage is the foundation of the country's tourism value proposition. Damaging it is bad economics as well as bad policy. AI contributes to its protection in several practical ways. Intelligent energy management in hotels reduces both operational costs and environmental footprint (Godolja et al., 2025). Predictive crowd management reduces pressure on vulnerable sites and, by redirecting visitors toward less-congested alternatives, distributes economic benefits more widely across the geography. AI-assisted carbon accounting gives operators and policymakers the data they need to make informed decisions about growth trajectories and land use (López-Naranjo et al., 2025).

The scope of AI in resource management extends beyond energy. Water consumption tracking, waste monitoring, and air quality assessment can all be managed more effectively with AI-driven systems than with periodic manual checks. In a context where the quality of the natural environment directly affects tourism revenue, the ability to detect environmental stress early, before it becomes visible to visitors or irreversible, has real economic value.

Overtourism tends to be self-defeating: the very popularity that draws visitors ends up degrading the things that made a place worth visiting. Albania has sites, among them Butrint, the Riviera, and the old city of Gjirokastra, where summer visitor pressure is already considerable. AI tools that model visitor flows in real time and under different policy scenarios give local authorities more options for responding proactively rather than reacting to damage after the fact (Alrawadieh et al., 2025). Virtual and augmented reality platforms for heritage sites offer a complementary approach: they allow visitors to engage with culturally significant locations without the physical attrition that comes with mass presence.

The case for AI adoption is, on balance, strong. The barriers to it are also real, and underestimating them leads to policy that works for a subset of the sector while leaving others further behind. Setting up an AI-capable operation, covering hardware, software, integration, and the staff competence to run it, represents a significant upfront investment. For the small family hotels and tour operators that make up the majority of Albanian tourism businesses, that cost is often simply out of reach. The problem is compounded by infrastructure: most AI applications require reliable, high-speed internet, which is not uniformly available across Albania. Rural and mountainous areas, where some of the country's most distinctive tourism experiences are located, are often the least well-served (Godolja et al., 2025).

Even where connectivity exists, the human capacity to implement and manage AI systems is often limited. The gap between Tirana, with its growing tech sector, and smaller rural tourism destinations in terms of digital skills and literacy is marked. Albania faces a broader challenge in this respect: emigration of younger, skilled workers is substantial, and the pool of professionals with backgrounds in data science or machine learning is correspondingly thin. Training programmes exist but lack the scale and coordination needed to close the gap systematically.

AI systems in tourism collect and process large quantities of personal data. The risk of misuse, breach, or simply inadequate protection is real, and it undermines the trust on which digital services depend (Putera et al., 2022). As Albania moves toward EU membership, GDPR compliance will become mandatory rather than aspirational, which creates both pressure and an opportunity to build robust data governance from the ground up. The issue of algorithmic bias deserves parallel attention: AI systems that inadvertently disadvantage particular groups of tourists or workers are not just ethically problematic but, when they become visible, damaging to reputation (Ma, 2024). And underpinning all of this is the question of what extended AI adoption does to the feel of hospitality. The personal warmth that characterises good Albanian guesthouses and family restaurants is not reducible to an algorithm, and strategies that treat AI as a replacement rather than a complement to human service risk eroding the sector's most distinctive asset (Milton, 2023).

5 Discussion

The evidence reviewed in this paper supports a fairly clear conclusion: AI is becoming a meaningful factor in how Albanian tourism operates, and the pace of adoption is likely to increase as visitor numbers continue to grow. The benefits, including improved operational efficiency, more personalised visitor experiences, and better environmental management, are real and reasonably well documented in the local context. These findings are broadly consistent with Samala et al. (2022) and Sousa et al. (2024), who show that AI is becoming more visible across customer service, decision-making and tourism operations. At the same time, the Albanian case shows that adoption is shaped by uneven infrastructure and uneven digital capacity, which makes the transition less automatic than in mature tourism markets.

The more important question, we think, is not whether Albania should adopt AI in its tourism sector but how. An adoption strategy that prioritises cost reduction above all else risks losing what makes Albanian hospitality worth choosing over somewhere else. One that treats AI as a tool for extending what human beings can do, rather than replacing them, is more likely to produce outcomes that are both economically productive and socially sustainable. This is where the paper adds to the existing discussion: it connects AI adoption not only with business efficiency but also with the preservation of local hospitality, environmental management and regional inclusion.

On the basis of the findings, we propose five recommendations. First, the Albanian government should develop a coherent national AI strategy for the tourism sector, one that includes financial support mechanisms, regulatory guidance for SMEs, and GDPR-aligned data governance standards from the outset, not as an afterthought. Second, sustained investment in digital skills is needed at every level of the sector. Training programmes that bring together universities, vocational colleges, and industry associations have the best chance of reaching the full range of businesses, including those in rural areas where the skills deficit is most pronounced.

Third, digital infrastructure gaps in areas beyond Tirana and the main coastal strip need targeted investment, both from government and from private operators who have a stake in a functioning sector-wide ecosystem. Fourth, there is a case for supporting applied research on AI in Albanian tourism specifically, including pilot projects in heritage site management and sustainable destination planning. Evidence generated locally is more likely to be trusted and used locally. Fifth, any AI adoption strategy should be anchored in a human-centred philosophy. The aim should be to augment what people in the sector can offer, not to automate them out of the picture. AI systems that support better decision-making and enable richer interactions between visitors and hosts will serve Albania better over time than those designed primarily to minimise human involvement.

To conclude: AI cannot replace the hospitality that is Albania's most genuine competitive advantage. But used carefully, it can help the sector manage its extraordinary growth in a way that is good for the economy, the environment, and the people who work in it.

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