



THE ROLE OF DIGITIZATION IN THE FIELD OF MEDICAL TOURISM IN THE EUROPEAN UNION

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Abstract. *Medical tourism is attracting increasing interest, particularly from wealthier countries, as certain destinations offer high-quality healthcare services at significantly lower costs. Defined as a combination of leisure travel and medical treatment, this field is being transformed by digitization. This study explores how health systems function in this context, the evolution of medical tourism, the benefits of digital platforms, and highlights successful examples of platform implementation.*

Keywords: medical tourism, digital platforms, interoperability, healthcare, patient experience

1. INTRODUCTION

Medical tourism represents a growing field within global healthcare systems. Its expansion is driven by rising healthcare costs in some countries and the availability of high-quality, cost-effective services in others. Digitization plays a transformative role by bridging gaps in access, coordination, and transparency. This paper investigates how digital tools have shaped the dynamics of medical tourism across the EU and globally, identifying opportunities and challenges from both institutional and technological perspectives. The demand for medical services beyond national borders has grown considerably, fueled by the disparities in healthcare costs, accessibility, and quality across countries. Medical tourism involves individuals traveling internationally for medical treatment, ranging from elective surgeries and dental care to fertility procedures and complex diagnostics. Over time, the drivers for such movement have evolved from mere affordability to the pursuit of high-quality, personalized care and shorter waiting periods [9].

The European Union represents a unique region where medical tourism is shaped not only by market dynamics but also by legal and ethical frameworks such as Directive 2011/24/EU on patients' rights in cross-border healthcare. This legal provision facilitates access to medical services across member states and promotes cooperation between national health systems.

The rise of digital technologies – particularly platforms enabling telemedicine, patient data interoperability, and AI-powered decision support – has expanded the scope and efficiency of medical tourism. These innovations are not only enhancing communication and diagnostics but also providing patients with decision-making tools and personalized treatment pathways [3], [5].

2. ANALYSIS OF HEALTH SYSTEMS IN THE CONTEXT OF MEDICAL TOURISM

Health systems vary significantly across countries in terms of accessibility, quality, and integration of services. In the

context of medical tourism, these differences become even more relevant as patients are exposed to unfamiliar administrative and clinical procedures. Countries with universal coverage, such as those in Western Europe, may offer stable care but at high costs and long waiting times. Others, like those in Eastern Europe or Asia, offer rapid and affordable access, but sometimes with less regulatory transparency.

Digital transformation in healthcare systems can also mitigate disparities between public and private sectors. In emerging medical tourism destinations such as Romania or Mexico, where public healthcare systems are under strain, private providers have capitalized on digital platforms to attract international patients. By leveraging centralized databases, multilingual interfaces, and flexible teleconsultation modules, these systems create seamless patient journeys that rival those of more developed markets [19], [20].

The implementation of digital tools such as Electronic Health Records (EHRs), teleconsultation platforms, and integrated billing systems allows health systems to better manage cross-border patients and ensures continuity of care. Digitally mature systems, such as those in Germany and Estonia, show that interoperability and data portability play key roles in the success of cross-border medical services [1], [7], [10].

Health systems across the EU vary in funding models, infrastructure, digital maturity, and capacity to handle foreign patients. Countries like Germany, France, and the Netherlands have well-developed public health systems with strong regulatory environments, but often struggle with waiting times. Conversely, countries like Hungary, Poland, and Romania attract patients by offering competitive pricing, swift access, and specialized private clinics [1], [4].

Digitalization has become a critical asset for overcoming systemic limitations. Through tools like electronic health records (EHRs), patient portals, and digital appointment systems, clinics and hospitals are able to streamline operations and improve patient outcomes. In Spain, for instance, the implementation of a virtual health platform tailored to medical tourists has shown how e-Government and e-Health services can be effectively integrated for this purpose [1].

Similarly, Turkey has established itself as a leader in regional health tourism by leveraging digital communication channels, multilingual interfaces, and coordinated data systems to connect international patients with healthcare providers efficiently [3].

In countries with fragmented or developing healthcare infrastructures, such as in parts of Africa, digital innovation – especially through satellite-based

telemedicine - is seen as a strategic necessity to bridge accessibility gaps [8].

3. EVOLUTION OF MEDICAL TOURISM

The history of medical tourism began with patients from less developed countries seeking advanced care in wealthier nations. However, the trend has reversed: today, many patients from the United States, Canada, and Western Europe travel to countries such as Turkey, Thailand, and India for dental work, cosmetic surgery, orthopedics, and fertility treatments [8], [9], [15].

The evolution of this field was influenced by several factors: cost disparities, accessibility of specialized procedures, and long waiting lists in the home countries. More recently, the COVID-19 pandemic highlighted the role of resilience and adaptability of health systems through digital means, as shown by the increased reliance on telehealth and digital triage platforms [17], [18].

An emerging trend is the rise of “preventive health tourism” driven by wellness diagnostics and genomic profiling. Countries like Switzerland and Singapore have begun to integrate precision medicine into their health tourism offers. These personalized health journeys are enhanced by data analytics and cloud-based storage systems, allowing continuity of care even after the patient returns home. As the focus of medical travel shifts from reactive care to proactive health management, digitization becomes not just a facilitator, but a structural necessity [4], [5].

Medical tourism has transitioned from a niche market to a structured industry over the past two decades. Initially driven by affordability, it is now influenced by broader factors such as digital literacy, the quality of healthcare services, international accreditation, and the availability of digital health records [16].

The Fourth Industrial Revolution has played a pivotal role in reshaping this field. Technologies such as artificial intelligence, big data, and robotic surgery are no longer the domain of only elite institutions. Increasingly, these tools are being adopted by clinics and hospitals seeking to differentiate themselves in the global marketplace [4].

During the COVID-19 pandemic, many medical tourism operators turned to digital triage, teleconsultation, and online booking platforms as alternatives to physical travel, sustaining their businesses in a highly disrupted environment [17], [18]. As digital resilience became synonymous with institutional stability, a new paradigm emerged - where health providers began investing more in digital infrastructure than in physical expansion.

4. THE BENEFITS OF DIGITAL MEDICAL PLATFORMS AND APPLICATIONS

Digital platforms serve as a bridge between patients and medical providers, enabling remote consultations, online appointment scheduling, and access to second opinions. HealthTap, Doctolib, Practo, and similar services have revolutionized patient access to international health services [18], [19].

Another crucial benefit is cross-platform integration. Patients can now export and synchronize data between

health and travel platforms - such as linking treatment schedules with accommodation, flight booking, or post-surgery recovery services. Some platforms even integrate insurance claim management and digital payment systems, removing administrative friction and enhancing trust for international patients [12], [13].

These platforms improve transparency through patient reviews and doctor ratings, offer cost comparisons, and facilitate the collection of digital health records. Additionally, the use of artificial intelligence and machine learning allows for better diagnostic assistance and personalized recommendations [6], [17].

Security and privacy of medical data remain key concerns. Technologies like blockchain help ensure data integrity and trust between parties [6]. Overall, digital platforms not only enhance the medical experience but also streamline travel logistics and communication across borders [1], [3], [5].

Digital platforms offer a multitude of benefits to both patients and providers. For patients, they provide access to medical information, direct booking systems, and even virtual consultations with foreign doctors. These platforms often integrate user reviews, cost transparency, and travel logistics, empowering patients to make informed decisions.

In countries such as Iran, digital health applications have allowed health institutions to modernize their services and improve communication between patients and specialists [7]. In Germany, the integration of digital services such as Doctolib enables patients to access multilingual appointment systems, synchronize medical histories, and receive automated reminders – streamlining the care process [6].

Blockchain technology has also entered the domain of medical tourism by enabling secure and immutable data exchange between providers, reducing fraud and administrative errors [6]. AI-driven tools are increasingly used for diagnostics, patient triage, and even treatment plan recommendations – transforming not just access, but the very nature of care itself [5], [17].

Moreover, platforms such as Practo and SehatQ expand beyond booking and into service ecosystems - offering pharmacy delivery, laboratory results integration, and health education tools for mobile-first populations [18].

5. EXAMPLES OF COUNTRIES THAT HAVE EFFECTIVELY DIGITALIZED THE MEDICAL SYSTEM

Several countries serve as models of successful digitization in the healthcare sector:

- Germany has implemented national electronic records and supports international data exchange via interoperable systems. Germany has combined a strong regulatory environment with robust digital tools such as EHRs and blockchain pilots, creating a patient-centered, secure, and integrated care experience [6], [10].
- Estonia provides citizens with digital IDs linked to healthcare access and patient portals, offering one of

the most complete e-health systems in the world. Estonia has implemented a fully digital health infrastructure where citizens access services via e-ID, and cross-border data exchange is facilitated through EU-wide interoperability standards.

- Turkey has developed multilingual digital portals aimed at medical tourists and invested in telehealth infrastructure [3].
- South Korea uses AI for diagnostics and has integrated wearable technologies and remote monitoring tools [5].
- Iran has initiated reforms based on medical informatics and has begun integrating digital tools in both education and service delivery [7].
- France has scaled platforms like Doctolib across the public and private sector, demonstrating the power of public-private collaboration in digital health.
- India and Indonesia, though less centralized, have adopted mobile-first solutions (Practo, SehatQ) to reach wide patient bases, including foreign users, thus democratizing access to medical services [18], [19].
- Each of these countries demonstrates that digitization is not a one-size-fits-all solution but must be tailored to infrastructure, policy environment, and public acceptance.

6. EFFECTIVE DIGITAL PLATFORM SOLUTIONS

A comparative analysis of five leading digital health platforms reveals differences in accessibility, functionality, and cost models:

Table 1. Leading digital health platforms

Platform	Origin	Key Features	Access Mode	Cost Model
HealthTap	USA	Telemedicine, AI assistant, chat	Web, mobile app	Freemium
Doctolib	France	Appointments, EHR integration	Web, mobile app	Free for patients
Jameda	Germany	Doctor ratings, booking	Web	Free
Practo	India	Marketplace, pharmacy, diagnostics	Web, mobile app	Freemium
SehatQ	Indonesia	E-health content, chat, e-pharmacy	Web, mobile app	Mostly free

Moreover, these platforms differ in their strategic orientation. While HealthTap and Practo focus on patient volume and diversified services (pharmacy, diagnostics, AI assistant), Doctolib and Jameda emphasize local physician scheduling and compliance with regional data privacy regulations (e.g., GDPR). SehatQ, on the other hand, illustrates a regional success story by addressing mobile-first populations in Southeast Asia, using chat-based interfaces and culturally adapted content [1], [3], [18].

The digital transformation of healthcare systems cannot be separated from the development and extensive use of digital platforms. These solutions facilitate patient access to medical services, improve communication with healthcare professionals, and support international medical tourism. In this section, we present a comparative analysis of five digital platforms relevant to the medical and medical tourism sectors: HealthTap, Doctolib, Jameda, Practo, and SehatQ.

Table 2. Comparative analysis of platforms

Platform	Covered Domains	Access Method	Costs	Key Features
HealthTap	Telemedicine, diagnostics, AI	Web, mobile app	Free & premium plans	AI responses, live chat, personalized subscriptions
Doctolib	Appointments, patient records	Web, mobile app	Free for patients	EHR integration, automatic notifications
Jameda	Doctor reviews, appointments	Web	Free	Doctor rankings, quick appointments
Practo	Telemedicine, pharmacies, labs	Web, mobile app	Free & paid services	Full integration, medical marketplace
SehatQ	Telemedicine, education, e-pharmacies	Web, mobile app	Mostly free	Medical articles, chat, online pharmacies

These platforms offer a wide range of solutions, from remote medical consultations to integrated patient data management and the promotion of medical services. Their versatility and adaptability to different socio-economic contexts make them essential tools for expanding access to quality healthcare, especially in the context of the globalization of medical tourism [18].

Table 3. Comparative Functionalities of Selected Digital Health Platforms

Platform	HealthTap	Doctolib	Jameda	Practo	SehatQ
Telemedicine	1	0	0	1	1
Online Appointments	1	1	1	1	0
Doctors Reviews	0	0	1	1	0
Integrated AI	1	0	0	0	0

E-pharmacy	0	0	0	1	1
Medical Articles / Education	1	2	0	1	1

Legend: 1 = present functionality, 0 = absent

Table 4. Access Modes, Estimated Costs, and Access Types of Selected Digital Health Platforms

Platform	Country	Access 1=web 2=web+Mobile	Patient Cost (€ approx./ month)	Access Type (0, 1, 2)
HealthTap	USA	2	0–45	1
Doctolib	France	2	0	0
Jameda	Germany	1	0	0
Practo	India	2	0–10	1
SehatQ	Indonesia	2	0–5	1

The costs are approximate and based on information from the respective public platforms (according to [12], [18], [3], [5], [7], [17], [21]).

This is a simplified scale that classifies how users can access the platform, as follows:

0=Free:

The user has full access to core functionalities at no cost. (e.g., Doctolib, Jameda – all essential functions are free for the patient).

1=Freemium (Freemium = Free + Premium – A business model where the product or service is offered for free at a basic level, but users must pay to access advanced or premium features):

The user has free access to basic features, but:

must pay for advanced features (subscriptions, premium consultations, etc.), or the platform offers a mix of free and paid services, depending on the chosen service level. (e.g., HealthTap offers free Q&A but also premium video consultations; Practo has free consultations as well as paid options; SehatQ provides free medical education, but some pharmacy or telemedicine services may incur charges).

2=Paid: Access is available only for a fee, even for basic functionalities. (This case did not appear among the five analyzed platforms but would be representative of some private systems in the US or exclusively B2B platforms). Beyond the five platforms already presented, it is essential to understand the performance criteria that make them effective for medical tourism.

These platforms differ in their use of AI, coverage of services, and integration levels with healthcare systems. The success of these platforms lies in their user-centric design, multilingual access, and support for cross-border coordination [18], [19].

7. DIGITALIZATION AND COMPETITIVE INTELLIGENCE – ENGINES OF GROWTH IN EUROPEAN MEDICAL TOURISM

European medical tourism is undergoing a phase of accelerated transformation, in which digitization and competitive intelligence (CI) act as complementary differentiation factors. This paper examines the synergy between the adoption of digital technologies - from telemedicine and big data analytics to blockchain - and the use of CI as a strategic tool for anticipating market trends, personalizing services, and strengthening the competitive position of the actors involved.

Medical tourism has evolved from a niche phenomenon into a globalized industry, in which patients travel to access higher-quality or lower-cost treatments. Digital transformations, alongside the pressure placed on healthcare systems in the post-COVID-19 context, have accelerated the international mobility of patients and created new competitive opportunities for clinics and medical destinations within the European Union. In this context, we explore the role of digital technologies and competitive intelligence in building sustainable competitive advantages.

In the context of the globalization of medical services, competitive intelligence (CI) is defined as the systematic process of collecting, analyzing, and interpreting relevant data about competitors, markets, consumer behaviors, and emerging trends, for the purpose of supporting strategic decisions.

CI goes beyond commercial espionage or passive information gathering. It involves an ethical and structured approach, where open sources (public reports, market analyses, statistical data, patient reviews, social networks, etc.) are used to construct a coherent contextual overview.

The applicability of CI in medical tourism extends across several essential dimensions:

Analysis of international demand: CI enables the understanding of patient preferences based on country of origin, type of treatment sought, seasonality, or cultural sensitivities [24], [31].

Competitor monitoring: Medical institutions can analyze pricing strategies, types of medical packages offered, promotional channels, and the reputation of rival clinics to position themselves more effectively in the market [22], [32].

Identification of new markets or niche segments: By analyzing global data (e.g., Google Trends, patient forums, demographic statistics), CI supports the expansion of services into underserved areas or population categories [23], [25].

Evaluation of own performance in a competitive context: Continuous benchmarking allows for the adjustment of internal strategies based on the performance of market leaders or international standards [29], [30].

Thus, CI becomes a transversal tool, integrable into the operations of marketing, strategy, IT, and medical management departments, supporting proactive and adaptive decisions in a volatile and complex environment [26], [27].

The synergy between digitization and competitive intelligence is not accidental but stems from the functional complementarity of these two strategic components. On the one hand, digitization provides the technological infrastructure needed for collecting and managing complex data (e.g., telemedicine platforms, e-health apps, electronic health records, AI interfaces) [27], [33]. On the other hand, CI leverages these data to extract actionable insights and guide the tactical and strategic decisions of healthcare actors [22], [31]. The integration of these dimensions ensures agility and adaptability in a competitive and data-driven healthcare ecosystem [28].

This synergy can be conceptualized in three main directions:

1. Personalization of medical services through competitive data: Digital platforms, by integrating CI, can recommend personalized treatments, clinics, or destinations based on the patient's history, budget, location, or other parameters. For instance, AI algorithms trained with competitive data can offer dynamic and predictive suggestions [17].

2. Development of strategically oriented digital medical ecosystems: Regions that combine investments in digital infrastructure with CI-based analytical capabilities (e.g., Germany, Estonia, South Korea) succeed in creating sustainable ecosystems that consistently attract international patients. These ecosystems include clinics, digital platforms, travel agencies, insurance companies, and local authorities in an interoperable network [5].

3. Smart market positioning and international medical branding: Through competitive analysis of urban medical imagery (big data), online reputation, search trends, and reviews, CI supports differentiated branding campaigns for medical destinations. Thus, cities or regions can position themselves as 'centers of excellence' in specific domains (e.g., oncology, dentistry, in vitro fertilization).

A relevant example is Turkey, which has strategically used data from digital communication platforms to target its promotion efforts toward Middle Eastern and Eastern European markets, resulting in significant increases in patient inflows [3].

In conclusion, the integration of CI into medical digitization processes is not just an option but a prerequisite for ensuring relevance and sustainability in international medical tourism. This convergence offers an operational framework where decisions are data-driven and innovation is strategically guided.

Romania benefits from a competitive quality-price ratio, a well-trained medical workforce, and proximity to Western European markets [8], [25]. However, the lack of a coherent national strategy for healthcare digitization and the fragmentation of public infrastructure limit its potential to become a regional hub in medical tourism [33], [34].

By adopting CI, Romania can identify profitable niches (e.g., dentistry, in vitro fertilization), monitor competitor strategies from Hungary and Poland, and develop

culturally adapted multilingual platforms for the diaspora [24], [32]. Investments in interoperability, international accreditations, and branding campaigns supported by data can transform the country from an opportunistic provider into a systemic actor on the European medical tourism market [23], [31].

The study demonstrates that the synergy between digitization and competitive intelligence represents a critical success factor in European medical tourism. In an increasingly data-driven and patient-centered global environment, the ability to harness real-time information, anticipate market trends, and deploy digital tools efficiently allows health systems and providers to differentiate themselves [22], [28].

Digitization enhances transparency, accessibility, and patient engagement, while competitive intelligence provides the strategic foresight necessary to identify emerging demands, optimize resource allocation, and benchmark against international best practices [27], [33].

Countries and institutions that integrate these components are better positioned to deliver personalized care pathways, streamline operational processes, and create seamless digital experiences for international patients [24], [29]. This integrated approach not only boosts operational efficiency but also strengthens trust, reputation, and long-term positioning in a highly competitive global market.

For Romania, embracing this synergy through the adoption of a strategic framework grounded in data analytics, AI, and digital platforms is crucial. Leveraging its existing strengths – such as competitive service pricing, a highly trained medical workforce, and a growing private healthcare sector – Romania can expand its visibility and credibility in the international medical tourism arena [34]. To do so, coordinated efforts are needed at both governmental and institutional levels, including investment in interoperable health IT infrastructure, support for digital innovation, and implementation of national branding strategies aligned with European quality standards [8].

8. CONCLUSIONS

The role of digitization in medical tourism is both enabling and transformative. It has improved efficiency, accessibility, and patient empowerment. From telemedicine to data-sharing infrastructure, digital innovations reshape how care is delivered and perceived across borders.

For the European Union and countries like Romania, digital tools offer a path to enhanced competitiveness in the global medical tourism market. Strategic investments in interoperability, cybersecurity, and patient-centric platforms are essential.

Ultimately, the convergence of medical expertise and digital innovation presents an opportunity to redefine health access beyond borders – safer, faster, and smarter.

9. FUTURE OUTLOOK

The digital transformation of medical tourism is expected to accelerate, particularly with the maturation of technologies such as edge computing, wearable health

devices, and digital twins. We foresee a future where AI-driven medical platforms will autonomously recommend care packages based on biometric feedback, and where borderless data sharing will allow hospitals in different countries to co-manage a single patient record in real-time. Ethical standards, cross-border legal harmonization, and cybersecurity frameworks will need to evolve in parallel to ensure trust and adoption across regions.

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