

Exploring Digital Innovation Issues in Luxury Hospitality Enterprises Towards EU Funding Status

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Abstract: The current study explores the trends of the technological advancements with regard to digital tools utilised by 4&5-star hotels, in order to identify how the relevant Cypriot market is in alignment with such innovative practices, leading oftentimes to improved entrepreneurial growth. Additionally, it emphasizes whether such enterprises are willing to implement such advanced instruments in order to ensure higher productivity, efficiency, and effectiveness. More specifically, this primary research strives to examine the strategic role of managerial decisions in applying cutting-edge technological tools and Artificial Intelligence (AI) in their operations in order to achieve sustainability and deploy innovation as well as ensure organisational resilience supported by EU funds. Empirically, qualitative study was conducted by tracing the views and experiences of 12 business executives within the Cypriot hospitality sector. Convenience sampling was employed by the research team to recruit potential participants before semi-structured in-depth interviews were carried out in the field, respectively. Moreover, through the perspectives of interviewees, the research offers insights of Cyprus' market reality, by taking into account that tourism constitutes the flagship of the country's economy. Findings indicate that digital innovation applications play a pivotal role in the ongoing digital transformation of the examined luxury tourism enterprises whilst they are prevalent used in certain internal and external functions ensuring enhanced organisational resilience and entrepreneurial competitiveness. Additionally, the support EU programmes, derived from the Green Deal, appear to be impactful on the establishment of the aforementioned digital equipment. Furthermore, conclusions, and recommendations provide a basis for future research on the specific topic, especially regarding certain EU policies contributed to enterprises' resilience process. Lastly, study's evidence could be useful to European and National institutions that deal with challenges towards digital transformation and formulate relevant policies as well as potential and active entrepreneurs in the field.

Keywords: Digital Innovation, Luxury Hotels, Cyprus, EU Funds

1. Introduction

Recent developments in the global economy have reshaped the way that the tourism industry is operating at a strategic level, hence, new challenges such as technological changes, security, innovation, to be considered as a major requirement for ensuring sustainable development (Dimanche & Andrades, 2024). Luxury hotels, such as those of 4&5 stars are facing increased challenges due to market shift, such as the travellers' experience, the alternative forms of accommodation, and the increased pressure by tour operators, to put more pressure for sustainable strategies (Luna-Cortés et al, 2022). Such practices should be viewed from a quality and brand image point-of-view, as sustainability has a direct positive impact on Customer Citizenship Behaviours (CCBs) and the much-needed Brand loyalty (Lin & Choe, 2022). Liu and Hu (2021) suggest that innovative branding is needed now more than ever before, hence, gaining improved market positioning and competitive advantage.

AI is experiencing a massive growth in the global economy, with its presence to be clearly visible in the vast majority of economic activities, thus, attracting the interest of both academics and professionals (Trabelsi, 2024). IMF (2024) strongly supports that AI will transform the entire global economy and will be more beneficial in advanced countries than emerging and low income (approximately 25%, 15%, and 10% respectively). However, companies should be extremely careful when implementing AI strategies, as despite obvious benefits in areas such as marketing and data analysis, problems such as poor customer experience due to human interaction may arise (Gonzales, 2023). Furthermore, the AI implementation should consider additional issues such as that of Cybersecurity which constitutes a real challenge for businesses that are not ready in terms of human capacity, knowhow, and technological infrastructure (Kaur et al, 2023).

AI and other digital tools have gained substantial position in the entire tourism industry, with operational fields such as marketing, room division, and food and beverage (F&B) to be amongst them (Belias et al, 2023). This enables the specific departments to become more independent in terms of strategic objectives and adjust to the new realities of the digital era which requires from the hotel industry to become more agile (Wynn & Jones, 2022). The positive effects of the AI implementation and other contemporary digital tools enables luxury hotels to implement branding strategies, therefore, reaching new market segments and strengthening their brand image (Djevojić & Vitasović, 2023). In any case, the integration of digital tools and AI should be viewed from a different perspective such as the Hotel Digital Capability (HDC) which requires the allocation of all appropriate resources (Fan et al, 2023).

Adopting AI and digital tools requires from organisations to comply with the existing legal framework in order to ensure that they will not engage into legal and ethical implications (Alqodsi & Gura, 2023). The European Union has responded rapidly to the implementation of AI in peoples' lives and businesses' operations, especially since AI has an impact on human rights and social issues (Kusche, 2024). The EU AI Act provides a rather holistic approach and is based on three major pillars, namely; understanding and assessing unacceptable risk, identifying high-risk applications, and ban unregulated high-risk actions as a result of AI (EU AI Act., 2023). This brings to the surface the need for contemporary hospitality businesses to educate its workforce in order to be able to comply with the emerging challenges and enable them to become more sustainable (Zhu et al, 2023). In this light, the current empirical study seeks to examine the evolution of the ongoing digital transformation in Cypriot luxury hotels by specifically focusing on the recent contributions of EU funds in the field of digital innovation and entrepreneurship.

2. Literature Review

The tourism and hospitality industry is an important economic sector of the Global and European economy that creates millions of jobs and contributes positively to the economic development of many countries. Its contribution has seen an increase over the years, and it is projected to exceed a value of \$11.4 trillion by 2028 in terms of Global GDP (WTTC.org, 2024). This is an unprecedented increase from \$8.8 trillion in 2019 (Hogenson Bray and Rugh, 2020). The sector is represented in 80% of small and medium-sized enterprises (SMEs) (WTTC, 2021) which makes it an even more important sector for many European countries since the backbone of the European economy is dominated by these companies (Suder, et al., 2024). The industry seems to overcome the setback of Covid-19 pandemic worldwide and arrivals have reached the pre pandemic numbers.

A particular niche part of the hospitality industry that has experienced a remarkable growth is the luxury hospitality market (Park et al, 2023). It is expected that this industry will increase from USD 93.4 billion in 2022 to USD 238.5 billion by 2028 (Fortune Business Insights, 2023). This is partly due to the general trend towards consumption of luxury items. Global spending on luxury travel accounts for approximately 20% of the total travel spending (Messe Berlin GmbH, 2018). Considering that luxury travel constitutes only 7% of all international travels, the economic impact of the luxury travel market is remarkable (Messe Berlin GmbH, 2018).

Hotels that are part of this market are operating in an increasingly competitive environment since the customers have become more demanding, looking for authenticity, high quality, innovative yet consistent and unique guest experiences offered in a seamless way. Luxury operators to offer the above experiences they need value added innovations which create more personalized experiences (Bharwani and Mathews, 2016). The innovations required in the luxury hospitality can either focus on the internal operations and processes or how their operational choices affect guests. A more ambitious innovation goal can be genuine guest-driven innovation (Johansson et al, 2024). This means that to succeed in this environment hotel companies need to undergo a digital transformation that require changes in the way they operate, market their brands, revenue models, structures and above all the company culture and strategy (Matt et al, 2015). There is a wide range of technology offerings that have been identified (Iranmanesh et al, 2022).

Other scholars have grouped the technologies into four groups: in-room, comfort, business essential and internet access (Liu and Hung, 2021). Park and Kim (2024) identified over 80 types of technology options in hotels while assessing customers' satisfaction and dissatisfaction related to technology. Overall, there is a shift toward smart environments in hotel operations and services due to the increasing availability and rapid evolution of technology amenities (Yang et al, 2021). Luxury brands like Marriott launched Artificial intelligent voice assistant and Four Seasons Hotel and Resorts are offering chat services 24/7 via chatbot (Cain et al, 2024).

The digital innovation and transformation that is required by the luxury brands faces though many challenges. Hospitality companies need to collect a vast amount of data and be able to analyze them and make sense of

them. There are a lot of additional channels for interaction with customer that need to be managed and evolving customer expectations in this new environment (Jain et al, 2023). The above means that companies on a European level but also in Cyprus need to use any possible means at their disposal to make the transition needed. EU has several funded programs to support digital transformation and innovation. It has put in place a massive recovery instrument called NextGenerationEU to deal with the aftermath of the Coronavirus and help EU countries and industries to create a greener, more digital and more resilient future. This instrument is expected to raise €712 billion by 2026, and the centrepiece of this effort is the Recovery and Resilience Facility (RRF) instrument. As part of the cohesion policies of EU, Cyprus has secured funds of €1.0 billion Euros (eufunds.com.cy, 2025).

Finally, another initiative launched by the EU commission is called Tourism transition pathway – Co-creation and co-implementation process. This initiative is targeted exclusively towards boosting the tourism economy and helping to accelerate the green and digital transition of the tourism economy and its ecosystems (Europa.eu, 2021).

Our study aims to contribute theoretically and empirically to the literature streams of luxury hospitality and digital innovation. First it provides an overview and context on the theme of luxury hospitality which is a topic that can be viewed from different perspectives (Wirtz et al., 2020). It redefines what luxury hospitality is and enhances the theory around this topic. Second, many researchers have stated that there is a need for research focused specifically on luxury hospitality (Amatulli et al., 2020; Batat, 2021; Farmaki et al., 2021). Our research aims to address this research gap. Third our research is the first one to provide empirical insights on the nexus between luxury hospitality and innovation. It is a study that has practical implications for hotel businesses that are aiming to utilize the funding tools that EU can provide them. Luxury hospitality is a very important part of the industry in Cyprus, and it needs to be investigated further. Our attempt is one of the first to do so.

3. Overview of the Cypriot Tourism Product and Hotel Infrastructure

Cyprus is considered a popular tourist destination (Panayidou et al, 2024) wherein the contribution of the hotel and catering sector to the Gross Domestic Product in 2023 was 6.3% and the total Gross Domestic Product in 2023 amounted to 29.8 billion euros at current prices (Pancyprian Hotel Association, 2024). Tourist arrivals in 2023 reached 3,845,652 increasing by 20.1% compared to 2022 with the main source of tourists coming from the United Kingdom with 33.9% of the total tourist traffic (Statistical Office, 2024). Worth noted that after the start of the war in Ukraine and the European Union sanctions against Russia, the arrivals of Russian citizens in Cyprus decreased sharply.

Prior to the aforementioned EU sanctions, Russia was the second most important market for tourism in Cyprus, holding 20% share of total tourism (Pancyprian Hotel Association, 2024). From 781,856 arrivals of Russian tourists in 2019, they were reduced to 65,803 in 2023 (Pancyprian Association of Hoteliers, 2024). In 2023, tourism revenues amounted to 2,990.6 million euros from 2,439.2 million euros in 2022, an increase of 22.6% (Cyprus Ministry of Tourism, 2024).

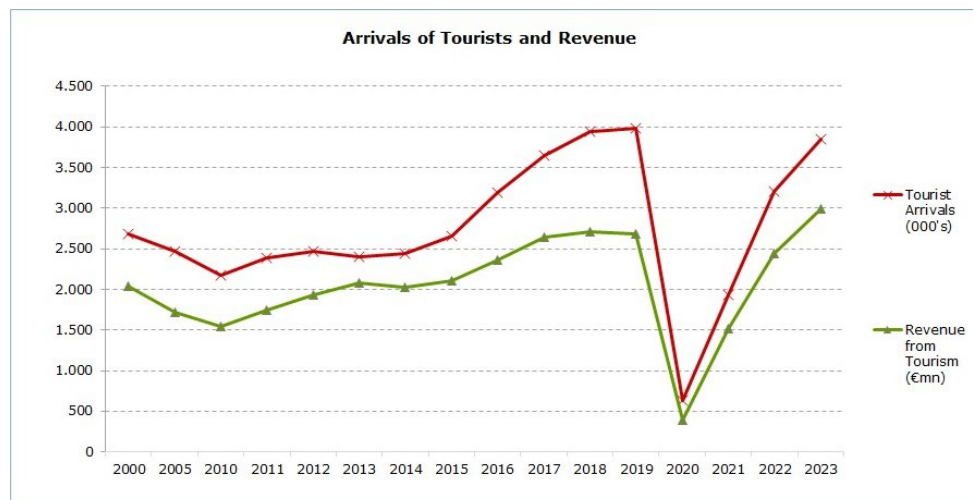


Figure 1: Tourist arrivals and revenues in 2000-2023.

Source: CYSTAT

Cyprus has 57,480 hotel beds, of which 14,204 in 5* hotels, 24,185 in 4* hotels, 13,801 in 3* hotels, 4,155 in 2* hotels and 1,135 in 1* hotels (Cyprus Hotel Association, 2024).

Table 1: Number of luxury hotel enterprises and bed capacities

Hotel Enterprises of Cyprus	5*	Beds	4*	Beds
	23	14,204	59	24,185

Source: Cyprus Hotel Association

4. Methodological Approach

Empirically, qualitative research approach was adopted, as considered adequate and effective in detecting and capturing personal perceptions, beliefs and experiences. The particular research method positively contributes to the exploration of entrepreneurship issues diversity and conducts in-depth insights (Apostolopoulos et al, 2019). It has the capacity to examine and clarify accurately the complexity of the phenomenon under investigation whilst analyses and specify entrepreneurship developments and emphasises notions, perspectives and opinions of interviewees. Furthermore, semi-structured interviews carried out achieving reliability of the examined issue. Twelve personal interviews were conducted with business executives coming from various places of Cyprus whilst followed by applying convenience sampling strategy. Table 3 captures key facets of the sample.

Table 2: Description of study sample

Respondent	Status	Area of Establishment
R1	Chief Operating Officer	Pafos District
R2	Chief Operating Officer	Pafos District
R3	Chief Operating Officer	Pafos District
R4	Chief Operating Officer	Pafos District
R5	Chief Operating Officer	Limassol District
R6	Front Desk Manager	Pafos District
R7	Front Desk Manager	Limassol District
R8	Quality Assurance Manager	Ammochostos District
R9	Administrative officer	Pafos District
R10	Head of human resources	Pafos District
R11	Business Development officer	Pafos District
R12	Business Development officer	Pafos District

On average each interview lasted one hour. Interviews were conducted in March 2025. Additionally, deductive and inductive reasoning were applied while cross-checks were performed based on the main themes (Azungah, 2018). Table 4 illustrates the themes and sub-themes, respectively.

Table 3: Thematic Analysis

Themes	Sub-Themes	Insights
Digital transformation & the role of EU financial tools	- Evolution of digital transformation and technological establishments - EU funding programmes towards digital and green transition	• Recovery and Resilience Facility (RRF) instrument

Themes	Sub-Themes	Insights
	- Incentives that drive entrepreneurs to utilize EU funding opportunities - Barriers in accessing EU funding sources	• Reflection on investment capability and funding accessibility
Usefulness of digital innovative applications.	- Field of digital innovation implementation within hotels - Type of tools - Existing benefits and obstacles - Customer experience - Digitalising energy systems	• Innovative strategies • Facilitating operations • PMS - increase employee productivity, improve operating efficiency.
Building resilience & enhancing competitiveness	- Level of adaptability and performance - Trait and process of resilience / withstand and rebound from successive crises innovation - Business strategies and competitive advantage	• Strengthen procedures • Utilising digital opportunities

5. Findings

5.1 Digital Transformation & the Role of EU Financial Tools

Respondents claimed that digitalisation process in the Cypriot hotel sector generally has not yet reached a decent level. Specifically, some of the interviewees stated that the whole digital transformation is still in its infancy. Previously, they have embraced digital technology and modern applications especially in terms of organizational practices.

"Digital tools offer solutions in different level within hotel. There is an ongoing digitalisation process and undoubtedly EU funding is very helpful, when it comes to digital transformation." (R1)

"We utilized funding of Recovery and Resilience Facility (RRF) instrument, for digital establishments" (R2)

"There exists specific financing namely from Recovery and Resilience Facility programme. It includes two main pillars, the green transition & the digital one. We got funded for second aspect. Mainly, for the needs of front desk services and customer experience such is virtual reality advancements. However, towards the latter I would say that most luxury hotels in Cyprus use digital tools indeed but not so much the AI applications. Digitalisation is an ongoing effort nonetheless." (R3)

"EU funds currently are available. In the past, we received funding via EU programmes but this occasion was an supplementary fund alongside our own capital for the investment of digital practices in different departments within enterprise." (R7)

However, according to the executives, the luxury hotels based on the pre-existing background and oftentimes due to financial capacity, they have proceeded to the implementation of digital solutions and establishment of digital tools by simultaneously utilising EU funding sources. They assess the presence and availability of these funds very useful in financing the relevant digital equipment and other practices related to digital innovation within their enterprises.

"We have access to EU funds, nonetheless, but, we need something value target since we will offer money as well. The participation usually in such plans is 30% to be offered by the business. Actually, it wasn't a bad choice in the past. We did get funded through NextGenerationEU." (R5)

Notably, most of the interviewees rated negatively the fact that EU support programmes requires the financial participation of the business concerning the investment / expenses of buying new equipment as they don't cover the overall cost.

"It's hard sometimes, you now, you have to offer capital too." (R9)

"You can gain a lot of benefits surely; we did that during previous years where we established certain digital innovations within operations. There is a participation price as well, so you need put some money whilst sometimes you get paid after offering initially the whole investment facing delays. But I feel it will be a successful selection." (R10)

Respondents claimed they have faced issues in the past towards the access to information provided by the relevant national authorities on funding programmes. Oftentimes, there is lack of information in the availability or the guidelines with regard to joining such EU programmes.

5.2 Usefulness of Digital Innovative Applications

Luxury hotel enterprises have applied digital practices through the use of novel digital instruments mostly, in the areas of financial services (such as using advanced software products for financial analysis and pricing procedures) and marketing and booking (such as utilising cutting-edge technologies like virtual tours, chatbots and real-time booking systems). At a certain degree they follow the trends of digital trends towards front office technologies by establishing new digital tools and relevant hardware equipment in order to share notifications that enabling staff to efficiently deliver prompt and tailored services. Additionally, when discussing the Cypriot landscape, they stated that AI applications it's not so popular and not vastly established within hotel operations generally. Lastly, energy efficiency systems were established using digital options, controlling and relevant indicators.

"We have adopted digital applications towards front desk. We have access to digital tools towards booking tasks and managing professionally specific issues as well. We use PMS as well." (R4)

"We now have digital tools be applied in various stages of operations and generally enhancing the better function." (R5)

"Anything towards main front desk is digitalised while focusing in booking and social media tasks as well. Digital innovation services are at the forefront using applications that facilitate the diffusion of information in order for quality provision to be carried out." (R7)

"We employed innovating approaches by establishing digital systems towards customer experience, services and energy efficiency. Self Service Technologies and AI security systems are established through this process of digitalisation as well as certain digital software products within the financial services." (R8)

Worth noted, hotel managers asserted that supplementary actions are needed when establishing advanced digital systems such workforce training and renovations.

"Upskilling and training of workforce is needed." (R2)

"Certainly, after you apply such tools in the operations, the staff must be trained respectively. You need to realise it quickly. Some of them are funded as well." (R6)

Ultimately, they feel that luxury hotels should keep focusing on employees since the human resources playing a pivotal role in customer experience and quality of services and should not be replaced, especially by AI applications.

5.3 Building Resilience and Enhancing Competitiveness

All respondents firmly believe that emerging technologies help hotel businesses become more efficient, improve customer experience, and drive growth. The specific advancements highlighted by the aforementioned business executives directly lead to become resilient and overcome challenges towards successive crises such the recent energy crises or the health crisis of Covid-19.

Luxury tourism enterprises prevalent use digital tools in certain internal and external functions ensuring better organisational resilience and entrepreneurial competitiveness. In addition, the support EU programmes, derived from the Green Deal, appear to be impactful on the establishment of the aforementioned digital equipment.

“Applying effective digital tool towards the staff and the functions lead to better organizational resilience.” (R1)

“Resilience and sustainability are the key when you adopt smart digital practices.” (R2)

“We have established smart systems for better administration and service provision at the same time mainly in the front desk and secondly within other departments such as the well-being services or the room smart devices and the customized services”. (R3)

This paper also highlights the importance of fundamental marketing practices, such as user-friendly websites, fast and reliable/mobile-friendly websites, search engine optimization, social media engagement, content marketing and data-driven revenue management, in maintaining a hotel's competitive advantage in the dynamic world of hospitality.

The findings indicate that hotel enterprises need to deal with a balance between embracing new innovative technologies and maintaining traditional procedures at the operational level to ensure organizational resilience, remain competitive, and drive revenue growth.

6. Discussion

The current research has revealed the strategic as well as emerging importance of digital transition in the tourism sector, with exceptional attention to be paid on luxury hotels, as these constitute a powerful part of the specific industry. The importance of incorporating cutting-edge digital tools in tourism has been clearly identified throughout the examination of the existing bibliography, which importantly, applies to a global scale (Iranmanesh et al, 2022). The recent work of Belias et al. (2023) provides a powerful guideline and understanding how the digitalisation of several luxury hotel departments, such as marketing, rooms divisions, and F&B, all crucial for their smooth operation and delivery of the expected quality.

The NextGenerationEU tool provides enormous opportunities whilst Recovery and Resilience Facility (RRF) can further contribute towards this direction as it provides several important supports which deals with aspects such as innovation, creativity, digitalisation, and sustainable development (Damiano, & Valenza, 2025) and opportunities for hotel enterprises to eventually present resilience. Towards the latter, current research's findings with regard to building organisational resilience are aligned with relevant studies in the field taking into account that interplay between resilience and organisational performance (Melián-Alzola et al, 2020). The digitalisation in the global luxury hotel industry is experiencing a constant growth, consequently, requiring from all stakeholders, especially those of the private sector, to adjust accordingly, this finding is consistent with the findings of other studies (Sanz-Lopez et al., 2024).

7. Conclusions

The changing environment of the global economy, especially that of tourism industry which has gone through some serious challenges over the past two decades, as a result of consecutive crises, requires from the luxury hotels to ensure innovative practices. This goes through incorporating cutting-edge technology which will enable them to take advantage of the opportunities provided in the global market, establish an improved working environment for the entire workforce, and most importantly, to ensure an improved customer experience. Working with both national and EU authorities can become a crucial factor towards this direction, can provide the appropriate guidance, and therefore, establish synergies that are essential in order to reach their strategic goals. Despite falling behind time in relation to other countries, the luxury hotels operating within the Republic of Cyprus possess the relevant experience that will drive them forward in relation to the under-examination issue. Big Data Analytics, Artificial Intelligence, Self Service Technologies and Robots, and Marketing tools, are only some of the emerging digital technologies that can provide the appropriate support to the luxury hotels.

Ethics Declaration

We hereby declare that no ethical clearance is required for the research / not applicable

AI Declaration

We hereby declare that no AI usage has been carried out throughout the conduction of the study and the preparation of the relevant manuscript.

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