ESSENTIAL VS. DESIRED DIGITAL SKILLS IN HOTEL INDUSTRY: IMPLICATIONS FOR TRAINING AND DEVELOPMENT

Sukma Yudistira
Universitas Negeri Padang
Kota Padang, Indonesia
E-mail: sukma.yudistira@fpp.unp.ac.id

Abstract

This study aims to identify and analyze the digital skills required in the hotel industry and distinguish between those necessary for basic operations and those desired for enhanced performance and competitive advantage. By reviewing the existing literature, this study provides a comprehensive overview of the digital competencies' hotel employees need to acquire to thrive in a digitalized environment. Furthermore, this study offers insights into which digital skills should be considered of high precedence and which are of lower precedence for inclusion in hotel management programs. The findings of this research have significant implications for both hotel management and education programs, particularly in terms of arranging effective training programs. By identifying critical and desirable digital skills, hotel management programs can design more targeted and relevant curricula that better prepare students for the demands of the industry. Additionally, the results can serve as a reference for hotel development plans, ensuring that both current and future employees possess the digital competencies necessary to excel in their roles.

Keyword: digital skills, hotel industry, need analysis, precedence

Introduction

The digital revolution has greatly influenced a multitude of sectors, revolutionizing conventional methods and introducing innovative approaches for enhancing productivity, efficiency, and client engagement.(AlMalki and Durugbo, 2022). Digital competencies have become increasingly essential for industries in the context of digitalization, as they play a significant role in maintaining a competitive edge. These competencies encompass a broad array of skills, including digital literacy, data analysis, cybersecurity, and proficiency in specific software and platforms (Prihanto and Kurniasari 2019; Leung et al. 2022; Ozgur Ozdemir et al. 2023). These capabilities empower businesses to optimize their operations, elevate customer experiences, and respond effectively to the dynamic technological environment.. Van Laar et al. (2020), The importance of determining the factors that contribute to 21st-century digital skills is crucial for professionals in a wide range of industries, highlighting the necessity for ongoing skill development and adjustment.

The hospitality sector, particularly the hotel industry, has undergone substantial changes as a result of the integration of digital technologies, which has had a significant impact on this industry (Line et al., 2020). Digital proficiency has proven to be a vital

aspect for hotel staff members, as it encompasses a wide range of hotel operations, including front desk administration, marketing initiatives, and guest services (Ivanov, 2020; World Tourism Organization, 2020). The hotel industry is confronted with distinct obstacles and prospects in the current digital age (Line et al. 2020). Hotels must leverage digital tools to manage reservations, personalize guest experiences, optimize pricing strategies, and maintain a robust online presence (Crystal Ip et al., 2011). Furthermore, the advent of technologies such as artificial intelligence (AI), virtual reality (VR), and Internet of Things (IoT) devices has introduced new dimensions to hotel management and guest services, necessitating a workforce adept at these areas (Leung et al., 2022). Studies, such as those by (Santiago Melián-González et al.. Bulchand-Gidumal, 2016) have demonstrated the positive correlation between information technology integration and hotel performance, underscoring the critical role of digital skills in this sector.

However, there remains a dearth in the current body of literature and educational programs pertaining to the prioritization of these digital skills. While prior studies have thoroughly investigated the array of digital skills required in diverse industries, including hospitality, they frequently neglect to establish skills that ought to be prioritized within hotel management programs. The swift proliferation of numerous digital technologies and the perpetual evolution of digital skills have engendered obstacles to these programs, thereby rendering it difficult to delineate and concentrate the curriculum on the most essential digital competencies. A study by Prihanto and Kurniasari (2019) on sustainable digital transformation in the hospitality industry in Indonesia highlighted the necessity of digital skills but did not delve into the prioritization of these skills. Similarly, Youssef et al. (2021) explored the enhancement of e-services through e-skills but stopped short of advising on the hierarchy of these skills in educational programs. This research gap leaves hotel management study programs without clear guidance on which digital skills to emphasize, potentially leading to a lack of focus and efficiency in preparing students for the industry.

The rapid pace of technological change has exacerbated this issue (Ozgur Ozdemir et al. 2023). New digital tools and platforms are continuously being developed, and the skills needed to effectively utilize these tools are constantly evolving (Buhalis, 2022). In the rapidly changing landscape of the hospitality industry, it is essential for hotel management programs to remain adaptable and responsive, and regularly update their curricula to keep up with technological advancements. However, without a structured approach to prioritizing digital skills, these programs may struggle to maintain their relevance and effectiveness. Therefore, this study aims to identify and evaluate the digital skills required in the hotel industry, distinguishing between those necessary for basic operations and those that can enhance performance and provide a competitive edge. Through a comprehensive review of the existing literature, this study provides an overview of the digital competencies that hotel employees need to acquire to succeed in a digitalized environment. Furthermore, this study seeks to address the lack of prioritization by providing insights into which digital skills should be considered a high precedence and which are of lower precedence for inclusion in hotel management study programs, thus assisting educational institutions in managing curriculum development and infrastructure support. Two research questions were asked: (1) What digital skills are required in the hotel industry? (2) How do the required digital skills contribute to the hotel industry?

The following sections explore general digital skills applicable across various industries, focusing on their relevance and application in the hotel sector. This study also delves into specific digital skills tailored to hotel operations, highlighting their

significance and impact on hotel performance and guest satisfaction. Through this analysis, this study seeks to contribute to the understanding of digital skill requirements in the hotel industry and offers insights for hotel management education programs to better align their curricula with industry needs. In short, the integration of digital skills in the hotel industry is not merely an option but a necessity in the current technological landscape. As hotels strive to meet the evolving expectations of digitally savvy guests and optimize their operations, equipping their workforce with appropriate digital competencies is crucial. This research endeavors to map out these essential skills, providing a foundation for further studies and practical applications in the hotel industry, and addressing the educational gap in prioritizing these competencies for future hotel management professionals. The findings of this study aim to guide hotel management study programs in developing a focused and responsive curriculum that prepares students to meet the dynamic demands of the digitalized hotel industry.

Literature Review

General Digital Skills

Digital skills have become indispensable across industries, as they enable organizations to leverage technology to improve efficiency, productivity, and innovation (Youssef et al., 2021). The spectrum of necessary digital competencies is broad, encompassing basic digital literacy, advanced technical skills, and soft skills that facilitate effective use of technology (Zaragoza-Sáez et al., 2022). Basic digital literacy forms the foundation of digital skills, involving the ability to use common software applications, navigate the internet, and communicate digitally. Laar et al. (2019) emphasize that digital literacy is crucial for all professionals as it enables them to perform essential tasks, such as document creation, email communication, and online research. These skills are universally applicable across industries and provide baseline competencies for further digital skill development.

Advanced technical skills, such as data analytics, cybersecurity, and programming, are in increasing demand. According to Sousa and Rocha (2019), data analytics skills are vital for interpreting and utilizing large volumes of data to inform business decisions. Organizations across sectors, including finance, healthcare, and retail, rely on data analytics to enhance their operations and customer insights. Cybersecurity is another critical competency given the increasing threat of cyberattacks. Grundke et al. (2018) highlight that cybersecurity skills are necessary to protect sensitive information and maintain the integrity of digital systems. These skills involve understanding security protocols, managing data breaches, and implementing robust security measures.

Hotel Industry Focus

The hotel industry, characterized by its emphasis on customer service and operational efficiency, has specific digital skill requirements that align with its unique operational and strategic goals. Customer Relationship Management (CRM) system proficiency is crucial for hotel employees. CRM systems help manage guest information, personalize services, and maintain customer loyalty. González and Gidumal (2016) demonstrated that the effective use of CRM systems can significantly enhance guest satisfaction and hotel performance. Employees must be skilled in navigating these systems, inputting and retrieving guest data, and utilizing information to offer tailored experiences. Property Management Systems (PMS) are essential for handling reservations, check-ins, check-outs, and room assignments. PMS proficiency is a fundamental skill for front desk staff and managers, enabling efficient operation and seamless guest experience

(Crystal Ip et al., 2011). The ability to operate these systems efficiently ensures that hotels can manage their inventory, pricing, and guest services effectively.

Digital marketing skills are becoming increasingly important for hotels to maintain a competitive edge. Hotels must be adept at using digital marketing tools to reach potential guests, promote services, and engage with customers online (Prihanto and Kurniasari 2019). This includes skills in search engine optimization (SEO), content creation, and social media management. Effective digital marketing strategies can drive bookings, enhance brand visibility, and foster customer loyalty. Data analytics and business intelligence are crucial for making informed decisions and optimizing hotel operations. Data-driven decision-making can enhance various aspects of hotel management, from pricing strategies to service improvements (Huang et al., 2021). Hotel managers and analysts must be proficient in using analytical tools to interpret data, identify trends, and develop actionable insights to improve business performance. Although cybersecurity may not be the primary focus in the hospitality literature, its importance cannot be overstated. Hotels handle vast amounts of sensitive guest information, making them prime targets for cyberattacks. Cybersecurity is essential for protecting guest data and maintaining trust (Grundke et al. 2018). Employees must be trained to recognize security threats, implement preventive measures, and respond effectively to data breaches.

The integration of digital skills into the hotel industry is crucial for maintaining competitiveness and providing exceptional guest experiences (Buhalis et al., 2023). While basic digital literacy and software proficiency are fundamental, advanced technical and soft skills play significant roles in optimizing hotel operations and ensuring security (Prihanto & Kurniasari, 2019). The hotel industry's unique demands necessitate specific competencies, such as CRM and PMS proficiency, digital marketing, data analytics, and cybersecurity. However, there is a gap in the prioritization of these skills within hotel management study programs. Rapid technological advancements and the emergence of new digital tools have created challenges for curriculum development, leading to difficulties in focusing on critical skills. Future research and educational initiatives should address this gap by providing clear guidance on prioritizing digital skills to better prepare students for the evolving demands of the hotel industry.

By understanding and prioritizing these digital competencies, hotel management study programs can develop a focused and responsive curriculum that equips students with the necessary skills to thrive in a digitalized hospitality environment. This study provides a foundation for further exploration and practical application in the field, contributing to the enhancement of digital skill education in the hotel industry.

Needs analysis

Needs analysis plays a crucial role in shaping effective training programs by identifying specific requirements and gaps in knowledge and skills. By utilizing quantitative analysis techniques, such as word frequency, co-occurrence, variability, and regression analysis of teacher training data, healthcare workers' training needs can be accurately assessed, leading to the design of tailored continuous professional development (CPD) programs (Markaki et al., 2021). Tools such as the Hennessy-Hicks Training Needs Analysis (TNA) questionnaire are instrumental in this process, aiding in the identification of individual, team/interprofessional, and organizational training needs across various healthcare settings globally (Mwansisya et al., 2021). Through a systematic approach to analyzing these needs, training programs can be customized to address specific areas of improvement, enhance knowledge and skills, improve

performance, and ultimately contribute to better outcomes in the education and healthcare sectors.

A comprehensive needs analysis involves several key components that are essential for effective planning and design. First, it is crucial to classify needs and employ various strategies for identification and analysis to ensure a deep understanding of requirements (Breman et al., 2019). Second, gaining insights into access to technology, confidence levels in relevant areas, and preferred learning methods are vital aspects of needs analysis, as highlighted in a case study on humanitarian logistics capacity building (Markaki et al., 2021). Additionally, addressing the challenges of domains with complex and evolving constraints, such as the case of a mission control group for the International Space Station, emphasizes the importance of adapting methods and tools to suit specific contexts for successful needs analysis (Breman et al., 2019).

Therefore, needs analysis theory is a robust framework rooted in the systematic identification and evaluation of gaps between current and desired competencies. This approach is particularly vital in educational contexts, where aligning curricula with the evolving demands of the industry ensures that graduates are well-prepared to meet professional standards and expectations. Originating from program evaluation and curriculum development disciplines, needs analysis helps educators and policymakers create targeted, relevant, and effective educational programs that bridge the gap between what is currently taught and what is needed in the workforce. In the context of curriculum development, needs analysis theory involves three key elements: needs, wants, and deficiencies (Brown, 1995). These elements form the cornerstone of a comprehensive evaluation process aimed at ensuring that educational programs are both relevant and forward-looking.

Needs are essential skills and knowledge that students must acquire to be competent in their professional roles. In the hospitality industry, this may include proficiency in digital tools, data analytics, cybersecurity, and customer relationship management systems. Identifying these needs involves engaging with industry stakeholders, analyzing job market trends, and reviewing technological advancements to determine the critical competencies that graduates must possess.

Wants refer to skills and knowledge that, while not critical, are highly desirable and can enhance a graduate's employability and effectiveness. These might include advanced proficiency in emerging technologies, such as artificial intelligence, virtual reality, and blockchain. Wants are often derived from aspirations and forward-thinking industry projections. Incorporating these skills into the curriculum can provide students with a competitive edge and foster innovation and leadership within the industry.

Deficiencies highlight the gaps between the current curriculum and identified needs and wants. This involves a critical assessment of existing educational programs to identify areas that lack essential or desirable skills. For instance, if a curriculum focuses heavily on traditional hospitality management practices but neglects the integration of digital marketing strategies, it would be considered a deficiency. Addressing these deficiencies requires curriculum redesign, inclusion of new courses or modules, and potential collaboration with industry experts to ensure that the curriculum remains relevant and comprehensive.

By applying a needs analysis to hotel management education, this study aims to provide a detailed comparison of industry requirements. The analysis will highlight specific gaps, such as areas where digital skills are fundamentally needed and dsired for advanced development. Ultimately, the application of needs analysis theory in this study aims to ensure that hotel management digital skills are not only aligned with current industry demands but also adaptable to future technological advancements. By

systematically identifying and addressing this issue, the business, instructor, and educator can better prepare employees for the digitalized landscape of the hospitality industry.

Methodology

This study employs a qualitative research design, focusing on (1) a comprehensive literature review to identify the digital skills required in the hotel industry and (2) needs analysis to identify the required digital skills necessary and desired in the hotel industry. This research utilizes secondary data from existing studies to determine the current state of digital skills in hotel management. The needs analysis framework is applied to categorize skills into necessary and desired categories, based on its applicability in the hotel industry.

The primary data source for this study is a thorough literature review of academic journals and relevant conference proceedings published in the last five years (2019-2024). Key references include the literature review, which focuses on identifying the digital skills discussed in these sources and their importance to hotel operations. To ensure a comprehensive and systematic review of the literature, the following protocol was established to select articles to be reviewed as secondary data in this study. This protocol aims to identify the most relevant recent studies related to digital skills in the hotel industry, ensuring that the analysis is based on high-quality pertinent up-to-date information.

Step 1: Define Inclusion and Exclusion Criteria

This step was carried out for the initial selection of articles. The databases used were Scopus with the search terms digital skills, hotel, digital competencies, and 21st-century digital skills. In this step, 155 articles were found. The inclusion and exclusion criteria were as follows:

Inclusion Criteria	Exclusion Criteria
1. Relevance: Articles must focus on digital skills, e-skills, within the hotel industry.	1. Irrelevance: Articles that do not focus on digital skills or are not related to the hotel industry.
2. Time Frame: Articles published within the last five years (2019-2024) to ensure the inclusion of the latest research and trends.	2. Publication Date: Articles published before 2019.
3. Source Type: Peer-reviewed journal articles, conference proceedings, high-impact publications, and scopus indexed	3. Source Type: Non-peer-reviewed articles, opinion pieces, editorials, and non-academic sources, non-scopus indexed
4. Language: Articles must be published in English.	4. Language: Articles published in languages other than English.
5. Geographic Scope: Studies from a global perspective, ensuring a diverse and comprehensive understanding of digital skills in various contexts.	

Step 2: Initial Screening

This step screens the Title and Abstract Review, which are initially the titles and abstracts of articles retrieved from the database search, and then reviews them to assess

their relevance to the study's focus on digital skills in the hotel industry. Duplicate articles that appeared in multiple databases were removed. In this step, 96 articles were selected.

Step 4: Full-Text Review

This step was to obtain full-text versions of the articles that passed the initial screening. A detailed evaluation was then conducted through a thorough review of the full text to determine the article's relevance, quality, and contribution to the understanding of digital skills in the hotel industry. This includes an assessment of the methodology, findings, and implications of each study. In this step, 22 articles were found.

Step 5: Quality Assessment

This step evaluates the credibility of the source, including the reputation of the journal, the impact factor, and the credentials of the authors. Assess the methodological rigor of the study, including the research design, sample size, data collection methods, and data analysis techniques. In addition, determine the relevance of the study's findings to the research questions and objectives of this study. In this step, 12 articles were selected.

Step 6: Data Extraction

Extract key information from each selected article, including Title, Authors, Publication year, journal name, research objectives, Methodology, Key findings related to digital skills, and implications for the hotel industry.

Step 7: Synthesis and Analysis

Thematic Analysis: Conduct a thematic analysis of the extracted data to identify common themes, trends, and gaps in the literature regarding digital skills in the hotel industry. Needs Analysis: Apply the needs analysis framework to categorize identified digital skills as necessary or desired, based on their importance and impact on hotel operations. The needs analysis framework was employed to categorize digital skills into two primary categories, (a) Necessitate Skills; These critical digital skills that are essential for effective hotel operations and management. They include competencies fundamental to daily operations, guest satisfaction, and overall hotel performance, and (b) Desired Skills; These digital skills that enhance hotel operations, but are not considered critical. They may provide a competitive edge and improve efficiency or guest experience, but are not essential for basic operations.

Ethical Considerations

This study relies on publicly available literature and secondary data, ensuring that ethical guidelines for data usage and citations are strictly followed. Proper attribution was given to all sources to maintain academic integrity.

Findings and Discussion

Findings

In the process of investigating digital skills within the hotel industry, the initial step involved thorough screening of titles and abstracts of articles retrieved from comprehensive database searches. This step was crucial for assessing the relevance of each article to the focus of the study. Subsequently, a meticulous duplicate removal process was conducted to ensure that any redundant articles appearing across multiple

databases were eliminated. As a result of these combined efforts, 96 pertinent articles were selected for further analysis, providing a solid foundation for the study. In the subsequent step, full-text versions of the articles that passed the initial screening were obtained for in-depth evaluation. This detailed evaluation involved a comprehensive review of each full text to determine its relevance, quality, and contribution to the understanding of digital skills in the hotel industry. The assessment focused on the methodology, findings, and implications of each study to ensure that they met the study's criteria. This thorough examination identified 22 articles that provided valuable insights and contributions to the research.

The next process included assessing the reputation of the journals, impact factors, and credentials of the authors to ensure the reliability of the information. Additionally, the methodological rigor of each study was scrutinized, focusing on the research design, sample size, data collection methods, and data analysis techniques. Furthermore, the relevance of each study's findings to the research questions and objectives was determined. Through this meticulous evaluation, 12 articles that offered high-quality insights for the study were selected. The selected articles were as follows:

Table 1 Selected articles

Authors	Title	Publication Year	Journal Name	Methodology	Key Findings Related to Digital Skills
(Youssef et al., 2021)	Do e-skills enhance use of e-services in the hospitality industry? A conditional mixed-process approach	2021	International Journal of Data and Network Science	Conditional mixed-process approach	E-skills significantly enhance the use of e-services in the hospitality industry
(Arthur Huang et al., 2021)	A network analysis of cross-occupational skill transferability for the hospitality industry	2021	International Journal of Contemporary Hospitality Management	Network analysis	Identifies key digital skills that are transferable across occupations within the industry, such as data analysis and customer relationship management
(Crystal Ip et al., 2011)	Progress and development of information and communication technologies in hospitality	2011	International Journal of Contemporary Hospitality Management	Literature review	ICT advancements have revolutionized hotel operations, improving communication, customer service, and operational efficiency
(J. Prihanto & Florentina Kurniasari, 2019)	Sustainable Digital Transformation in the Hospitality Industry: A Study of the Hotel Industry in Indonesia	2019	International Conference on Organizational Innovation	Case study	Digital transformation in hotels leads to improved sustainability and operational efficiency, with a significant role played by digital skills
(M. Sheresheva et al., 2019)	Digital Platforms in Hospitality Business	2019	Springer	Case study, literature review	Digital platforms require skills in data management, online marketing, and customer interaction

(M. Sousa & Á. Rocha, 2019)	Skills for disruptive digital business	2019	Journal of Business Research	Survey, literature review	Key skills include data analytics, digital marketing, cybersecurity, and innovation management
(Ram Narayan et al., 2022)	Hospitality Feedback System 4.0: Digitalization of Feedback System with Integration of Industry 4.0 Enabling Technologies	2022	Sustainability	System development, case study	Integration of digital feedback systems requires skills in data analysis, IoT, and customer feedback management
(Carlisle et al., 2023)	The digital skills divide: Evidence from the European tourism industry	2021	Journal of Tourism Futures	Survey, data analysis	Significant digital skills divide exists, with critical needs in digital literacy, cybersecurity, and advanced ICT skills
(T. Lui & L. Goel, 2022)	Learning effectiveness of 3D virtual reality in hospitality training: A situated cognitive perspective	2022	Journal of Hospitality and Tourism Technology	Experimental study, survey	3D VR training enhances learning outcomes in areas such as guest interaction, crisis management, and operational procedures
(Adeyinka-Ojo et al., 2020)	Hospitality and tourism education in an emerging digital economy	2020	Worldwide Hospitality and Tourism Themes	Literature review, survey	Digital economy necessitates skills in data analytics, digital marketing, online customer service, and ICT management

Through the full text review and data extraction, the digital skills found and their description in the selected articles can be defined as follows:

Table 2 Category and description of digital skills

Digital Skill Category	Description
E-services and ICT Proficiency	Enhanced e-skills increase the use of e-services, improving operational efficiency and customer satisfaction. Understanding the role of Information and Communication Technologies (ICTs) in hotel management.
Digital Marketing Skills	Integration of traditional marketing principles with modern digital tools to enhance customer engagement and marketing effectiveness.
Robotics and VR Training Skills	Skills required for effective interaction with robots in lower-skilled hospitality jobs. Effectiveness of VR game training for hospitality employees.
General Digital Competency	Identification of key determinants of digital skills among professionals, such as education, workplace training, and personal initiative. Performance-based measurement of digital skills.
Sustainable Digital Transformation	Digital skills and technologies essential for achieving

	sustainable operations and improving service quality in the hospitality industry.
Digital Competencies for Entrepreneurship	Skills required for women tourism entrepreneurs in Latin America, addressing barriers and potential for digital skills to drive business growth and innovation.
Skills for Resilient Growth	Importance of digital skills for adapting to market changes and improving service delivery in the Serbian tourism and hospitality sector.
Digital Platform Skills	Use of digital platforms in the hospitality industry to streamline operations, enhance customer experiences, and drive business growth.
Adaptability and Continuous Learning	Skills needed for managing disruptive digital businesses, emphasizing adaptability, continuous learning, and technological proficiency. Continuous skills assessment and development.
Tourism Sector Digital Skills	Assessment of digital skills required in the tourism sector, highlighting gaps and proposing strategies for targeted training. Policy responses and training initiatives to address emerging constraints in digital skills.
Post-COVID Digital Competencies	Digital skills required for hotel employees in Thailand to adapt to new operational challenges post-COVID-19.
Partnership Management Skills	Digital skills critical for managing partnerships between virtual hotel operators and small-to-medium-sized hotels.
Bridging the Digital Skills Divide	Strategies to bridge the digital skills divide in the European tourism industry to enhance competitiveness.
Market Performance Improvement	Strategies for improving market performance in the digital economy, emphasizing digital skills for competitive advantage.
Targeted Training Initiatives	Identification of key digital skills gaps in the tourism sector and proposing targeted training initiatives.

Discussion
Determining Necessitate and Desired Digital Skills
Necessitate Skills

The necessary skills encompass critical digital competencies that are essential for effective hotel operations, management, and guest satisfaction. These skills are fundamental to the daily functioning of hotels and have a direct impact on their performance, competitiveness, and ability to meet guest expectations.

a. Digital Communication Skills

As hotels increasingly adopt automation and digital platforms, the ability to interact with these technologies has become essential. Skills in managing automatic systems for tasks such as housekeeping, food delivery, and guest services are critical for ensuring seamless operations. The effective use of digital communication platforms also enhances staff coordination and guest interactions, leading to improved service delivery and operational efficiency. These skills are indispensable for creating a tech-savvy workforce capable of leveraging advanced tools to enhance guest experiences and streamline operations (C. Lloyd & Jonathan Payne, 2022; M. Sheresheva et al., 2019).

b. ICT Proficiency

Proficiency in Information and Communication Technologies (ICT) and e-skills is vital for managing hotel operations effectively. These skills include the ability to use digital booking systems, property management systems (PMS), customer relationship management (CRM) software, and other digital tools that facilitate daily operations. Enhanced ICT skills enable hotel staff to optimize resource management, improve communication, and provide timely and accurate information to guests, which is crucial for maintaining high service standards and operational efficiency (Eberhard et al., 2017; Youssef et al., 2021)

c. Digital Customer Service

In an era in which guest expectations are increasingly influenced by digital interactions, digital customer service skills are critical. These skills include the ability to manage online bookings, handle digital check-ins/check-outs, and respond promptly to guest inquiries via digital platforms such as social media, email, and chatbots. Effective digital customer service enhances guest satisfaction and loyalty by providing seamless, personalized, and efficient services (Lazić et al., 2023; Promnil et al., 2024). Additionally, the digital competencies of women tourism entrepreneurs and resilient growth in the hospitality sector highlight the importance of inclusive and adaptive skill sets to meet diverse guest needs and ensure the sector's robustness (Khoo et al., 2024).

Desired Skills

Desired skills are digital competencies that enhance hotel operations but are not deemed critical for basic functioning. These skills provide a competitive edge, improve efficiency, and elevate guest experience; however, their absence does not necessarily hinder fundamental operations.

a. Digital Marketing Skills

Integrating traditional marketing principles with modern digital tools is highly beneficial in a competitive hospitality market. Digital marketing skills, such as social media management, search engine optimization (SEO), content marketing, and data-driven marketing strategies, enhance customer engagement and personalization. These skills enable hotels to reach a broader audience, tailor their offerings to individual preferences, and create compelling marketing campaigns to promote bookings and loyalty. While not critical for daily operations, these skills provide significant advantages in terms of visibility and guest acquisition (Bilgihan & Ricci, 2024; Putra & Law, 2024)

b. Data Analytics

Proficiency in data analytics allows hotel management to make informed data-driven decisions. Skills in data collection, analysis, and interpretation enable hotels to understand market trends, guest preferences, and operational efficiency. Data analytics can drive innovation, optimize pricing strategies, enhance revenue management, and improve overall service quality. While these skills are not essential for basic operations, they significantly contribute to strategic planning and competitive positioning by providing insights that inform business strategies and enhance guest experiences (J. Prihanto & Florentina Kurniasari, 2019; Van Laar et al., 2020)

The distinction between necessary and desired skills is grounded in their impact on hotel operations and guest satisfaction. Necessitate Skills are critical for maintaining daily operations, ensuring efficient service delivery, and meeting fundamental guest

expectations. Without these skills, hotels would struggle to operate effectively, leading to potential service failures and decreased guest satisfaction. The selected necessary skills directly contribute to core operational functions, such as check-in/check-out processes, room management, guest communication, and overall service quality. Desired Skills enhance operations by providing additional benefits that improve efficiency, competitiveness, and guest experience. Although they are not essential for basic operations, they offer substantial value in terms of strategic growth and differentiation. The desired skills enable hotels to leverage advanced marketing techniques, harness data for better decision-making, and create more personalized and engaging guest experiences. Their absence does not cripple operations but may limit a hotel's ability to fully capitalize on market opportunities and achieve long-term success. By categorizing digital skills into necessitate and desired, hotels and education programs can prioritize training and development efforts, ensuring that essential competencies are in place while also striving to adopt advanced skills that provide a competitive edge. This approach ensures that hotels are well equipped to meet current operational demands while also positioning themselves for future growth and innovation.

The Role of Digital Skills in Enhancing the Hospitality Industry

Digital skills play a transformative role in enhancing the hospitality industry, impacting various aspects of operations, management, guest satisfaction, and competitive positioning (Carlisle et al., 2023; E.V. Laar et al., 2019; Youssef et al., 2021). Thus, the integration of digital competencies is crucial for hotels to adapt to evolving technological trends, meet modern expectations, and maintain operational efficiency. Digital skills enable staff to use Property Management Systems (PMS), online booking platforms, and automated check-in/check-out systems, which streamline operations and reduce manual workloads. This leads to faster service delivery and fewer errors. Proficiency in interacting with and managing robots for routine tasks such as cleaning, room services, and guest assistance helps improve efficiency and allows human staff to focus on more complex, personalized services (C. Lloyd & Jonathan Payne, 2022).

Digital skills in data analytics and customer relationship management (CRM) allow hotels to personalize guest experiences by analyzing preferences and tailoring services accordingly. Personalized marketing and service delivery can significantly enhance guest satisfaction and loyalty (Leung et al. 2022; Yongmin Chen 2020). Moreover, Skills in using digital communication platforms, including social media, email, and chatbots, ensure that guest inquiries and concerns are addressed promptly and effectively. This enhances guest engagement and builds a positive brand reputation (M. Sheresheva et al., 2019; Yongmin Chen, 2020). Proficiency in digital marketing strategies, such as SEO, social media marketing, and email campaigns, helps hotels reach a broader audience and attract more books. Effective use of digital marketing tools can drive engagement, increase brand visibility, and boost occupancy rates (Bilgihan and Ricci, 2024; Yongmin Chen, 2020). In addition, digital skills enable hotels to create loyalty programs and personalized marketing efforts that reward repeat customers, fostering long-term relationships and customer retention.

Data analytics skills enable hotel management to collect and analyze data on occupancy rates, revenue, customer preferences, and operational efficiency. These insights inform strategic decisions, optimize resource allocation, and enhance overall performance (J. Prihanto & Florentina Kurniasari, 2019; Van Laar et al., 2020). Understanding market trends through data analysis helps hotels anticipate changes in demand, adjust pricing strategies, and remain competitive in a dynamic market

environment. Digital skills also enable hotels to stay at the forefront of technological advancements such as virtual reality (VR) training for staff, which improves learning outcomes and skill acquisition (Leung et al., 2022). Embracing innovative technologies can help differentiate hotels from their competitors. Digital skills are crucial for implementing sustainable practices through efficient energy management systems and digital monitoring tools, which can reduce operational costs and appeal to environmentally conscious guests (. Prihanto & Florentina Kurniasari, 2019).

The ability to quickly adapt to digital tools is essential during crises such as the COVID-19 pandemic, where contactless services and digital communication became paramount. Digital competencies help hotels pivot operations and continue serving guests under challenging conditions (Promnil et al., 2024). The continuous improvement of digital skills ensures that hotel staff and management are prepared for future technological disruptions and can seamlessly integrate new tools and platforms as they emerge.

Digital skills are fundamental to the modern hospitality industry, driving operational efficiency, enhancing guest experiences, enabling targeted marketing, and fostering data-driven decision-making. These skills not only improve current operations but also position hotels for sustainable growth and competitive advantage in a rapidly evolving technological landscape. Investing in the development of digital competencies is essential for any hotel to thrive in the digital age. The summary is as follows:

Table 3   Digitals skills and its role in hotel digital transformation

Digital Skills	Description	Role in Digital Transformation	Categorization
Digital Communication	Skills involving effective communication through digital platforms, including emails, social media, and online customer interaction.	Enhances customer engagement and satisfaction by facilitating efficient and responsive communication.	Necessitate
Data Analysis	The ability to interpret and analyze data to make informed decisions and drive business strategies.	Provides insights for better decision-making, optimizing operations, and improving customer experiences.	Necessitate
Digital Marketing	Using digital channels to promote and sell products or services, including social media, email marketing, and online advertising.	Expands market reach, increases brand visibility, and drives customer acquisition and retention through targeted campaigns.	Desired
Digital Content Creation	The process of creating digital content such as blog posts, videos, infographics, and social media posts to engage and inform audiences.	Enhances customer engagement, provides valuable information, and builds brand authority and trust.	Desired
ICT Proficiency	Proficiency in Information and Communication Technology, including using software applications, operating	Fundamental for leveraging technology to improve operational efficiency, enhance service delivery, and	Necessitate

	systems, and hardware.	enable digital transformation initiatives.	
Digital Customer Service	Skills for managing customer interactions and relationships through digital platforms, ensuring effective and satisfactory service.	Improves customer satisfaction and loyalty by providing seamless and efficient service through digital channels.	Necessitate
Robotics Operation	Skills for operating and interacting with robots, including programming, maintenance, and troubleshooting.	Enhances productivity and efficiency in operations, particularly in repetitive or labor-intensive tasks.	Desired

Conclusion

This study provides a comprehensive overview of the digital competencies hotel employees need to acquire to thrive in a digitalized environment. By distinguishing between necessary and desirable digital skills, this study offers valuable insights for hotel management and educational institutions. Identifying high-priority digital skills allows for the development of more focused and efficient curricula in hotel management programs, ensuring that graduates are well prepared to meet industry demands. Furthermore, these findings can guide hotel management in structuring training programs to enhance employee performance and guest satisfaction. Ultimately, this study contributes to the ongoing development of the hotel industry by highlighting the critical role of digital skills in achieving operational excellence and competitive advantage. Future research is recommended to identify the gap between the precedence of digital skills and the current training program or curriculum in hotel education.

References

Adeyinka-Ojo, S., Lee, S., Abdullah, S. K., & Teo, J. (2020). Hospitality and tourism education in an emerging digital economy. *Worldwide Hospitality and Tourism Themes*, *12*(2), 113–125. https://doi.org/10.1108/WHATT-12-2019-0075

AlMalki, H. A., & Durugbo, C. M. (2022). Systematic review of institutional innovation literature: Towards a multi-level management model. *Management Review Quarterly*. https://doi.org/10.1007/s11301-022-00259-8

Arthur Huang, Tyler J. Fisher, Huiling Ding, & Zhishan Guo. (2021). A network analysis of cross-occupational skill transferability for the hospitality industry. *International Journal of Contemporary Hospitality Management*. https://doi.org/10.1108/ijchm-01-2021-0073

Bilgihan, A., & Ricci, P. (2024). The new era of hotel marketing: Integrating cutting-edge technologies with core marketing principles. *Journal of Hospitality and Tourism Technology*, *Query date: 2024-07-29 09:20:03*. https://doi.org/10.1108/JHTT-04-2023-0095

Breman, J., Giacumo, L. A., & Griffith-Boyes, R. (2019). A Needs Analysis to Inform Global Humanitarian Capacity Building. *TechTrends*, *63*(3), 294–303. https://doi.org/10.1007/s11528-019-00390-6

Buhalis, D. (2022). Drivers of e-Tourism. In Z. Xiang, M. Fuchs, U. Gretzel, & W. Höpken (Eds.), *Handbook of e-Tourism* (pp. 1–17). Springer International Publishing. https://doi.org/10.1007/978-3-030-05324-6_6-1

Buhalis, D., O'Connor, P., & Leung, R. (2023). Smart hospitality: From smart cities and smart tourism towards agile business ecosystems in networked destinations. *International Journal of Contemporary Hospitality Management*, *35*(1), 369–393. https://doi.org/10.1108/IJCHM-04-2022-0497

C. Lloyd & Jonathan Payne. (2022). Digital skills in context: Working with robots in lower-skilled jobs. *Economic and Industrial Democracy*, *44*, 1084–1104. https://doi.org/10.1177/0143831X221111416

Carlisle, S., Ivanov, S., & Dijkmans, C. (2023). The digital skills divide: Evidence from the European tourism industry. *Journal of Tourism Futures*, *Query date: 2024-07-29 09:20:03*. https://doi.org/10.1108/JTF-07-2020-0114

Crystal Ip, Rosanna Leung, & R. Law. (2011). Progress and development of information and communication technologies in hospitality. *International Journal of Contemporary Hospitality Management*, *23*, 533–551. https://doi.org/10.1108/09596111111130029

E. V. Laar, A. V. Deursen, J. Dijk, & J. Haan. (2019). Determinants of 21st-century digital skills: A large-scale survey among working professionals. *Comput. Hum. Behav.*, *100*, 93–104. https://doi.org/10.1016/J.CHB.2019.06.017

Eberhard, B., , Mickael Podio , Azucena Pérez Alonso , Evita Radovica, Lidija Avotina, L. P., Maria Caamaño Sendon, A. G. L., & Solé-Pla, J. (2017). Smart work: The transformation of the labour market due to the fourth industrial revolution (I4.0). *International Journal of Business and Economic Sciences Applied*, *10*(3), 47–66. http://dx.doi.org/10.25103/ijbesar.103.03 This

Huang, A., De la Mora Velasco, E., Marsh, J., & Workman, H. (2021). COVID-19 and the future of work in the hospitality industry. *International Journal of Hospitality Management*, *97*(May), 102986. https://doi.org/10.1016/j.ijhm.2021.102986

Ivanov, S. (2020). The impact of automation on tourism and hospitality jobs. *Information Technology & Tourism*, *22*(2), 205–215. https://doi.org/10.1007/s40558-020-00175-1

J. Prihanto & Florentina Kurniasari. (2019). Sustainable Digital Transformation in the Hospitality Industry: A Study of the Hotel Industry in Indonesia. *Proceedings of the 2019 International Conference on Organizational Innovation (ICOI 2019)*. https://doi.org/10.2991/icoi-19.2019.38

Khoo, C., Yang, E., Tan, R., & ... (2024). Opportunities and challenges of digital competencies for women tourism entrepreneurs in Latin America: A gendered perspective. *Journal of …*, *Query date: 2024-07-29 09:20:03*. https://doi.org/10.1080/09669582.2023.2189622

Lazić, M., Bradić-Martinović, A., & Banović, J. (2023). Digital skills in tourism and hospitality as a precondition for the sector resilient growth: The case of Serbia. *Menadzment u Hotelijerstvu i Turizmu*, *11*(1), 25–40. https://doi.org/10.5937/menhottur2301025L

Leung, X. Y., Chen, H., Chang, W., & Mhlanga, L. (2022). Is VR game training more effective for hospitality employees? A longitudinal experiment. *Tourism Management Perspectives*, *44*, 101020. https://doi.org/10.1016/j.tmp.2022.101020

Line, N. D., Dogru, T., El-Manstrly, D., Buoye, A., Malthouse, E., & Kandampully, J. (2020). Control, use and ownership of big data: A reciprocal view of customer big data value in the hospitality and tourism industry. *Tourism Management*, *80*, 104106. https://doi.org/10.1016/j.tourman.2020.104106

Liu, Y., Yan, Y., Xia, H., & Sun, K. (2023). Analysing the longitudinal course selection panel data (2014-2020) of K-12 teachers from Zhejiang province: A comprehensive study on in-service training needs. *Professional Development in Education*, 1–21. https://doi.org/10.1080/19415257.2023.2241874

M. Sheresheva, I. I. Savelyev, Nelli N. Nadzharyan, & A. Kudryavtsev. (2019). *Digital Platforms in Hospitality Business*. https://doi.org/10.1007/978-3-030-40749-0_10

M. Sousa & Á. Rocha. (2019). Skills for disruptive digital business. *Journal of Business Research*. https://doi.org/10.1016/J.JBUSRES.2017.12.051

Markaki, A., Malhotra, S., Billings, R., & Theus, L. (2021). Training needs assessment: Tool utilization and global impact. *BMC Medical Education*, *21*(1), 310. https://doi.org/10.1186/s12909-021-02748-y

Mwansisya, T., Mbekenga, C., Isangula, K., Mwasha, L., Pallangyo, E., Edwards, G., Orwa, J., Mantel, M., Mugerwa, M., Subi, L., Mrema, S., Siso, D., Selestine, E., & Temmerman, M. (2021). Translation and validation of Training Needs Analysis Questionnaire among reproductive, maternal and newborn health workers in Tanzania. *BMC Health Services Research*, *21*(1), 735. https://doi.org/10.1186/s12913-021-06686-9

Ozgur Ozdemir, T. Dogru, M. Kizildag, & Ezgi Erkmen. (2023). A critical reflection on digitalization for the hospitality and tourism industry: Value implications for stakeholders. *International Journal of Contemporary Hospitality Management*. https://doi.org/10.1108/ijchm-04-2022-0535

Promnil, N., Srepirote, K., & ... (2024). Exploratory factor analysis of hotel employee competencies in Thailand: The evidence after the COVID-19 pandemic. *Cogent Business & ...*, *Query date: 2024-07-29 09:20:03*. https://doi.org/10.1080/23311975.2024.2364850

Putra, F., & Law, R. (2024). Critical success factors for virtual hotel operator partnership with small-and medium-sized hotels: Perspectives of owners and operators. *Journal of Hospitality and Tourism Insights*, *Query date: 2024-07-29 09:20:03*. https://doi.org/10.1108/JHTI-06-2022-0244

Ram Narayan, A. Gehlot, Rajesh Singh, S. Akram, Neeraj Priyadarshi, & Bhekisipho Twala. (2022). Hospitality Feedback System 4.0: Digitalization of Feedback System with Integration of Industry 4.0 Enabling Technologies. *Sustainability*. https://doi.org/10.3390/su141912158

Robert Grundke, Luca Marcolin, & Mariagrazia Squicciarini. (2018). *Which skills for the digital era?: Returns to skills analysis*. https://doi.org/10.1787/9A9479B5-EN

Santiago Melián-González & J. Bulchand-Gidumal. (2016). A model that connects information technology and hotel performance. *Tourism Management*, *53*, 30–37. https://doi.org/10.1016/J.TOURMAN.2015.09.005

T. Lui & L. Goel. (2022). Learning effectiveness of 3D virtual reality in hospitality training: A situated cognitive perspective. *Journal of Hospitality and Tourism Technology*. https://doi.org/10.1108/jhtt-03-2021-0091

Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2020). Determinants of 21st-Century Skills and 21st-Century Digital Skills for Workers: A Systematic Literature Review. *SAGE Open*, *10*(1), 215824401990017. https://doi.org/10.1177/2158244019900176

World Tourism Organization. (2020). *Digital Transformation | UN Tourism*. Digital Transformation. https://www.unwto.org/digital-transformation

Yongmin Chen. (2020). Improving market performance in the digital economy. *China Economic Review*, *62*, 101482–101482. https://doi.org/10.1016/j.chieco.2020.101482

Youssef, A. B., Dahmani, M., & Zeqiri, A. (2021). Do e-skills enhance use of e-services in the hospitality industry? A conditional mixed-process approach. *International Journal of Data and Network Science*, *5*(4), 519–530. https://doi.org/10.5267/j.ijdns.2021.8.015

Zaragoza-Sáez, P., Marco-Lajara, B., & Ubeda-Garcia, M. (2022). Digital skills in tourism. A study from the Next Tourism Generation (NTG) Alliance. *Measuring Business Excellence*, *26*(1), 106–121. https://doi.org/10.1108/MBE-11-2020-0151