Strategic Use of Information Technologies in Tourism: A Review and Critique

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Abstract

The impact of information and communication technologies (ICTs) on firms' strategic development and value creation has been a topic of academic debate for decades. Tourism is no exception. This chapter provides a synthesis of the literature on the strategic decision to adopt and use ICTs as well as an analysis of their impact on the value creation of tourism firms. We reflect on theoretical frameworks and analytical concepts developed and validated by tourism scholars, their implications for ICT use, and the factors affecting the realization of ICT-enhanced business value. Problems of measurement, analysis, and organizational adjustments appear as major factors behind volatile ICT productivity in tourism, known as the ICT Productivity Paradox. To ensure

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the realization of ICT-enhanced business value, various adjustment strategies, including the development of firms' capabilities, cultures, and organizational structures, are addressed. The discussion section critically assesses the reviewed literature on the strategic use of ICTs in tourism. Finally, the conclusion deduces research needs and sketches an agenda for future research.

Keywords

Strategic ICT use · ICT impact · ICT Productivity Paradox · Organizational adjustment · Critical review

Introduction

Information is considered the lifeblood of tourism (Werthner and Klein 1999; Fesenmaier et al. 2004; Law et al. 2009; Navio-Marco et al. 2018). Thus, it is unsurprising that a continuously growing body of literature is debating the strategic use and benefits of information and communication technologies (ICTs) in travel and tourism (Poon 1993; Buhalis 1998; Gretzel and Fesenmaier 2001; Gretzel et al. 2001; Werthner and Ricci 2004; Fuchs and Höpken 2011; Benckendorff et al. 2019; Hughes and Moscardo 2019; Ivars-Baidal et al. 2021). Overall, six types of "drivers" are found in the literature on the value of ICTs' strategic adoption and uses in tourism firms (Buhalis 2003; Sigala 2003a; Buhalis and Zoge 2007; Abdelkader and Barkhi 2009; Fuchs et al. 2010a; Biligihan et al. 2011; Torrent-Sellens et al. 2016):

- *Drivers behind cost reductions*, i.e., operations-related efficiency gains due to reduced communication, information, and distribution costs.
- *Market drivers*, i.e., factors that emerged due to differentiated and customized traveller and visitor services through closer relationships to customers and flexible pricing.
- *Demand drivers*, i.e., aspects that arose due to travellers' and visitors' increased motivations and capabilities to effectively use ICTs for experience enhancement
- *Competitive drivers*, i.e., market dynamics that appeared due to changed barriers to entry, electronic business networks, and improved conditions for knowledge acquisition (i.e., smart destination).
- *Tourism drivers*, i.e., tourism as a social practice and amalgam product requires collaboration on the international scale among organizations from multiple sectors (e.g., the arts, culture, hospitality, transport, sports, government, etc.). The design, delivery, and management of tourism offers require interorganizational and cross-border collaborations that can only be effectively achieved through ICT systems or smart ecosystems (Sigala 2013; Xiang 2018).
- *Government & regulatory drivers*, i.e., geopolitical (in-)stability, global competition, market deregulation (e.g., *Open Skies*), and reregulation requiring firms to

collaborate online, even with competitors (co-opetition), in business ecosystems, thereby elevating competition from the firm to the network level.

These drivers affect both tangible and intangible business value from the strategic use of ICTs. However, intangible values in particular cannot easily be materialized and translated into economic terms and are thus difficult to measure (Sigala 2003b), implying that ICTs' returns on investment (ROIs) and other performance dimensions of the firm are difficult to quantify; as such, strategic decisions about ICT investments are hard to make and justify (Sigala 2020a). This challenge has been one of the major causes of the phenomenon known as the ICT Productivity Paradox, which refers to an inconclusive theory about the impact of ICTs on firm performance and productivity metrics (Sigala et al. 2004; Scholochow et al. 2010). Tourism firms are no exception from this paradox, therefore encountering various challenges and difficulties in ICTs' strategic investment, implementation, use, and performance measurement (Fuchs et al. 2010a,b).

This chapter reviews the literature on the strategic use of ICTs in tourism. The aim is to synthesize and reflect on the frameworks that theoretically explain the strategic use of ICTs in tourism and the concepts and methods that measure ICTs' usage and impact on business value and firm performance and to reveal the factors that contribute to the ICT Productivity Paradox in tourism. Accordingly, section "Strategic Use of ICT in Tourism" reviews previous studies and discusses their proposed frameworks in relation to the strategic use of ICTs in tourism, its theoretical implications, and the expected factors determining the realization of ICT-enhanced business value. Section "Impact of ICT on Business Value and Organizational Performance" reviews prior work on the complex relationship between the strategic use of ICTs and organizational performance in tourism. After a brief introduction to major disciplinary and theoretical foundations, we highlight typical measurement and analysis methods used to quantify these impacts. In this way, sector-specific insights into the strategic use and impact of ICTs are synthesized, such as those of the hotel sector, the airline sector, destination management organizations (DMOs), and e-intermediaries in tourism. In section "Unraveling the ICT Productivity Paradox in Tourism", after an introduction to the concept of productivity, we debate the reasons for the ICT Productivity Paradox in tourism. The following types of explanations are highlighted: (a) *measurement problems*, e.g., due to varying productivity concepts and measurement methods, resistance to adopt technology, etc.; (b) *analysis problems* due to differing methods for testing the ICT Productivity Paradox; and (c) *organizational adjustment problems*, such as new skill requirements, de-/recentralization, and the reallocation of business processes (Sigala et al. 2004; Espino-Rodriguez and Padrón-Robaina 2005; Scholochow et al. 2010). Finally, we discuss major adjustment strategies for capabilities and organizational structures that firms may undertake to make full use of ICTs to enhance their business value (Sigala 2020a). In fact, addressing the ICT Productivity Paradox not only contributes to theory, but it also provides practical implications and end-user guidelines (Sigala 2003b). The discussion section recapitulates and critically reflects on the reviewed literature on the strategic use of ICTs in tourism (Joullié 2020).

Finally, the conclusion identifies major research needs and sketches a *transformative* agenda for future research on the strategic use of ICTs in tourism (Gretzel et al. 2020).

Strategic Use of ICT in Tourism

This section synthesizes major conceptual and empirical work on the strategic use of ICTs in tourism. We reflect on theoretical frameworks and concepts adopted by the e-tourism literature, implications for the strategic use of ICTs, and the factors affecting the hypothesized realization of ICT-enhanced business value for tourism firms.

Buhalis' (1998) seminal paper "Strategic Use of Information Technologies in the Tourism Industry" highlights the strategic importance of ICTs for various tourism sectors. The author identified intra- and interorganizational as well as customer-oriented ICT usage areas. The framework used built on Porter's (1980, 1998) generic strategy framework recommended for analyzing the strategic opportunities of particular industries. In this way, Buhalis (1998) applied Porter's competitive forces, namely, suppliers' and buyers' bargaining power, threat of new entrants, product substitutes, and rivalry among existing competitors, to analyze the expected impact of particular ICT applications, like global distribution systems (GDS) and the World Wide Web (WWW), in various tourism sectors. Notably, Buhalis (1998) highlighted that it would be difficult for single firms to gain and measure ICT-enhanced business value, attributing this difficulty to the lack of companies' long-term orientation and strategic visioning, which in turn results in low ICT adoption and – ultimately – competitive disadvantage. In line with the strategy literature before the millennium (Porter 1985; Porter and Millar 1985; Earl 1994), Buhalis (1998) concluded that to ensure integration and optimal usage of ICTs for internal operations and external value chains, tourism firms need to update and reengineer their business operations, organizational structures, and control systems. Strategic visioning, commitment, and training would trigger this process.

Following Evans and Wurster (1999), who claimed that traditional business models would become obsolete because the Internet blurs the trade-off between information richness and reach, Gretzel and Fesenmaier (2001) inferred organizations' strategic needs to understand how they could be transformed to favor technology integration. Strategic need is driven by increased online interactivity (e-commerce), the promptness needed for business transactions, and the necessity to collaborate and communicate online. The authors proposed the concept of *Internet readiness*, which incorporates the stages of technology use, such as automation-substitution, transformation-reconfiguration, and the organization's capacity to change, i.e., the extent to which knowledge management and organizational learning are implemented (ibid 2001). Following organizational development theory (Huffington et al. 1997), major factors are considered responsible for the realization of ICT-induced business value: (1) *environmental conditions* (i.e., economic, legal, political, and technological); (2) *leadership effectiveness*; (3) *organizational rigidity*

(e.g., hierarchy, networks, roles, [in-]formal communication, authority, degree of participation in decisions, etc.); (4) *change managementt* (e.g., top-down/bottom-up, in-/externally triggered, resistance to change, etc.); and, finally, (5) *corporate culture* (e.g., goal consistency, responsiveness, knowledge sharing, honesty, trust, open environment, tolerance for failure, etc.; Gretzel and Fesenmaier 2001, 86–91). The authors applied the Internet readiness model to measure the effectiveness of technology use and the capacity to change for US Convention and Visitor Bureaus (CVBs). Findings revealed that only a small share of CVBs is structured appropriately to maximize the potential impact of Internet-based technologies.

Porter's significant work on competitive strategy and on the ways Internet technologies would sustain competitive advantage (Porter 1980, 1985, 1998, 2001; Porter and Millar 1985) has inspired the work of many tourism scholars (Crouch and Ritchie 1999; Yu and Law 2000; Flagestad and Hope 2001; Weiermair 2001) and leading strategy researchers (Barnes et al. 2003; Kim et al. 2004). Similarly, Buhalis and Zoge's (2007) study also hypothesized that Porter's five competitive forces are affected by Internet technologies in the following ways: (1) *entry barriers*, because the Internet would alter economies of scale and the amount of capital required to compete within an industry; (2) *rivalry* among competitors, because the Internet would increase the ability to differentiate and to change cost structures; (3) decreased *suppliers' bargaining power*, because the Internet would reduce the need to buy from only a few powerful suppliers (ibid 2007, 481), while at the same time suppliers' bargaining power would increase through direct customer contact, decreasing distribution costs and alliances with affiliates and distributors; (4) *Threats of substitution*, because the Internet is supposed to "influence the relative value/price and switching costs of substitutes" (Porter 1985, 65); and finally, (5) as Internet technologies like price comparison sites increase market transparency and opportunities to shop online, *customers' bargaining power* also would increase. Buhalis and Zoge (2007) conducted interviews with representatives from the hotel, airline, travel agency, and tour operator sectors to assess the hypothesized effects of the Internet in these business domains. While tourism representatives drew differing and even ambivalent conclusions, they all agreed that customers' bargaining power would increase because of the possibility to instantly access relevant and accurate information and the opportunity to interact directly with suppliers. While rivalry between firms with traditional distribution channels was expected to increase, those suppliers could enhance business value through Internet technologies that can utilize customer data from customer relationship management systems, thereby offering consumers tailored value-added products and bypassing traditional distribution logics (Buhalis and Zoge 2007, 491).

In a similar way, Stiakakis and Georgiadis (2011) built on Porter's (2001) work on Internet technologies' role in sustaining competitive advantages. However, the authors more critically noted that the impact from Internet technologies is expected to be negative for tourism suppliers (due to lowered barriers to entry for new online businesses and the threat of substitutes easily identifiable by consumers) or even strongly negative (due to increased rivalry). Regarding suppliers' bargaining power, the effect is both positive (due to lower dependency on traditional intermediaries)

and negative (due to new dependencies on online intermediaries). Finally, the authors expected strong positive effects from Internet technologies on consumers' bargaining power due to decreased loyalty and switching costs. Since ICTs add to firms' revenue and cost streams, the authors concluded that ICTs constitute a competitive advantage only if tourism firms are capable to develop their business strategy and establish new interactions between customers and other organizations. Examples are the customization of tourist products and the personalization of service experiences by dynamically adaptive and interactive mobile services (Höpken et al. 2010; Fuchs et al. 2011b). Examples for new interactions with organizations include the sharing of heterogeneous tourism information and operational data to ensure service-level interoperability, dynamic packaging, and the integration of user-generated content from social media. The authors concluded that more attention should be paid to the negative implications of Internet technologies and that small-scale tourism firms are mostly unaware of ICTs' multiple risks and benefits.

Anwar et al. (2014) provide a key study examining the role of ICTs in providing aid for economic development in developing countries. The authors emphasized ICTs' role in generating benefits at the micro (business) and macro (region, country) levels because ICTs enable tourism businesses to internationalize and to pursue new market opportunities. However, tourism is an international industry by nature; thus, ICTs will further intensify competition in an increasingly globalized tourism industry. Notably, Anwar et al.'s (2014) findings revealed that the rate of ICT adoption and use in developing countries is constrained by regulatory frameworks, limited financial resources, and employees' low ICT skills. In addition, the dominance and market power exerted by foreign investments and global players like TripAdvisor and online travel agencies implies that ICTs offer only limited opportunities to the numerous micro and small-sized tourism firms and DMOs to gain economic independence (e.g., by bypassing dominant intermediaries) and to reap economic benefits in developing countries. In fact, the digital divide is closely related to the economic divide. However, the economic gap does not only differentiate between the developing and the developed world but particularly between small national companies and large multinationals, given that the latter control an unfairly high amount of capital and resources to exploit ICTs. Anwar et al.'s (2014) conclusion contradicts the often generalized capacity of ICTs to empower small-sized companies in developing countries to gain global exposure by accessing international markets directly. Rather, ICTs seem to widen the economic gap because the economic and political context of developing countries constrains companies' ability to exploit and integrate ICTs into their business strategies and operations.

To provide a better understanding of how to integrate ICTs in tourism organizations to enhance business value, Mo et al. (2015) proposed a framework that combines the resource-based theory (Newbert 2008), the contingency theory (Teo and King 1997), and the value discipline theory (Treacy and Wiersema 1995). The authors validated their framework with data from the professional conference organizer (PCO) sector. Following the resource-based and the value

discipline theory, the authors showed that ICT-enhanced business value is gained when firms are capable of aligning humans' ICT skills and ICT resources (ICT infrastructure, ICT-related partnerships, etc.) with business strategies and functions. Finally, contingency theory implies that organizational context (e.g., IT spending and planning, management perception, operations' scope, etc.) and environmental context (i.e., pressure from customers, suppliers, and competitors) affect ICT usage. Case-based evidence demonstrates that although PCOs show a strong capacity for aligning ICT resources with business strategies and processes, only ICT and product alignment is found to affect firm performance, again confirming the difficulty of realizing ICT-enhanced value.

Following Porter's (1980) strategy theory, time of action (first-mover advantage) co-determines firms' strategic value. However, Dhaigude et al. (2016) demonstrated that it is equally important to not only adopt ICTs quickly in order to meet customer, market, and competitor pressures but also to be capable of using ICT innovations in an appropriate manner. Their study combined adoption diffusion and usage diffusion theories to analyze strategic ICT adoption and to explain the link between ICT use and tourism firms' ability to formulate strategies to gain ICT benefits (Shih and Venkatesh 2004). Dhaigude et al. (2016) addressed limitations of previous ICT adoption frameworks that had ignored the types of strategic ICT usage. The model consists of three parts (ICT adoption determinants, ICT usage patterns, and business outcomes), and the rate or time of adoption and the rate and variety in ICT use are additionally considered when linking ICT usage with strategy formulation. Interestingly, four determinants affect strategic ICT usage patterns and business benefits, namely, experience and frustration with technology, technological sophistication, and the current service/product portfolio.

Technological advances, such as robotics (Ivanov et al. 2019), artificial intelligence (Höpken et al. 2015; Hopken and Fuchs 2022), big data analytics (Mariani et al. 2018), and ambient intelligence (Buhalis 2020), are transforming tourism from what is widely called digital tourism into smart tourism (Xiang 2018). The foundational papers by Gretzel et al. (2015a,b) conceptualize the term *smart tourism* by unraveling its constituent parts and the anticipated impacts of its strategic use. Notably, smart tourism uses technologies to achieve environmental and sociocultural benefits (beyond solely economic benefits), such as effective and fair governance, sustainability, and quality of life, thereby connecting elements of physical infrastructures (e.g., smart home, smart factory, etc.) with the digital sphere. Accordingly, smart tourism includes three building blocks: smart experience, smart business ecosystem, and smart destination,the latter of which comprises a smart data layer supporting all blocks. The experience component focuses on technology-mediated tourism experiences and their enhancement through personalization, context awareness, and real-time synchronization (Beer et al. 2007; Höpken et al. 2010; Buhalis and Amaranggana 2014, 2015). Smart destinations focus on creating smart ecosystems (Gretzel et al. 2015b; Ness 2021) where tourism and non-tourism stakeholders use smart technologies to exchange, integrate, and combine resources to co-create value (Neuhofer 2016; Boes et al. 2016). The smart data component includes an information layer that collects all types of relevant customer,

supplier, citizen, and contextual data (e.g., web-based, sensor/tracking, operational, traffic and weather data, etc.); an exchange layer supporting interconnectivity and interoperability; and, finally, a processing layer for the analysis, visualization, integration, and intelligent use of data and extracted knowledge.

Höpken et al. (2011) provided an example of these interconnected components. The authors applied various machine learning and online analytical processing (OLAP) methods in the context of a destination management information system (DMIS) prototypically implemented for Swedish destinations. Their business intelligence (BI) architecture integrates and combines data sources, like customers' web search and navigation as well as booking and feedback data. Within this research vein, Höpken et al. (2014, 2015) and Keil et al. (2017) proposed a multidimensional destination data warehouse which permits interactive BI-based (i.e., automated) data extraction and knowledge generation, such as decision trees estimating tourists' booking and cancellation behavior (Höpken et al. 2018), association rules and sequential patterns predicting travellers' movement patterns and place attachment (Höpken et al. 2020a), and artificial neural networks prognosticating international arrivals (Höpken et al. 2020b). In line with the sustainability objective of smart tourism, Fuchs et al. (2013) employed OLAP−technologies to identify visitors with the smallest ecological footprint. Then, Fuchs et al. (2014a) used machine learning methods (i.e., support vector machines, naïve Bayes and *k*-nearest neighbor) to analyze the sentiments and detect the properties related to travellers' online reviews.

Most recently, Buhalis (2020) highlighted the strategic relevance of ambient intelligence (AmI) for smart tourism, characterized by disruptive technologies, such as the Internet of Things, the Internet of Everything, the 5th generation mobile network (5G), Radio Frequency Identification (RFID), mobile devices, wearable smartphones, apps along with application programming interfaces (APIs), cryptocurrency and blockchain, sensor and beacon networks, pervasive computing, gamification, as well as analytical capabilities supported by artificial intelligence and machine learning (ibid 2020). These technologies create the information structure and smart digital grid that support the seamless interoperability of destination stakeholders, thus driving constantly evolving dynamic networks.

Having summarized and reflected on previous research on the strategic use of ICTs in tourism, we assert that the majority of authors (e.g. Buhalis 1998; Buhalis and Zoge 2007; Stiakakis and Georgiadis 2011; Mo et al. 2015; Dhaigude et al. 2016) operate within frameworks that emerged from Porter's work on competitive forces (Porter 1998) and on ICTs' role in sustaining competitive advantage (Porter 2001; Porter and Heppelmann 2014). Following resource-based theory, the alignment of ICTs with a firm's strategy is supposed to be determined by a rather mechanistic process that views strategy mainly as a deal with industry position, scope and control of resources, and competencies. In contrast, the knowledge-based theory postulates a more organic perspective, viewing strategy as an evolutionary process and focusing more strongly on the interactive, integrative, and communicative aspects of strategic planning, strategy formulation, and adaptation (Teece 2007; Reihlen and Ringerg 2013). The examples in which strategic use of ICTs plays a crucial role in assisting tourism organizations in managing and promoting

knowledge creation through corporate learning include the work by Gretzel and Fesenmaier (2001), Höpken et al. (2011, 2015) and Fuchs et al. (2013, 2014a). While tourism organizations and tourism destinations are increasingly required to operate smartly, the concept of smart tourism has recently been criticized as a poorly defined buzzword that does not necessarily help tourism organizations to optimally employ ICTs for their strategic and sustainability goals (Tribe and Mkono 2017; Mariani et al. 2018; Cavalheiro et al. 2020; Ivars-Baidal et al. 2021). As such, the concept needs more meaningful explanation to counterbalance the dominant and often euphoric focus on technology with softer values and meaning, which would allow for the construction of a truly sustainable path of smart destination development (Gelter et al. 2020; Sigala 2020a; Gretzel et al. 2020).

Impact of ICT on Business Value and Organizational Performance

This section synthesizes tourism studies that empirically analyze the relationship between the strategic use of ICTs and organizational performance. Theories and concepts linking strategic decision areas, ICT usage, and its impact on internal and external value chain operations as well as on organizational performance are discussed. Analysis methods used to quantify ICT-enhanced impacts are stressed as well. We highlight the strategic use of ICTs and their impact in tourism branches such as destination management organizations, the hotel and the airline sectors, e-intermediaries, convention bureaus, and online auctions.

Support for understanding value creation induced by the adoption and use of ICTs stems from various disciplines and related theories. For example, economists have stressed entrepreneurs' innovation behavior (**?**Casson 1982) and digital network effects (i.e., scale and scope effects) as primarily responsible for ICT-induced value creation (Katz and Shapiro 1985; Shapiro and Varian 1999). Moreover, transaction cost efficiencies are gained by reducing information asymmetries, uncertainty, and complexity (Williamson 1983; Wu et al. 2003). As noted, strategic management science theorizes ICT-based value creation mainly through the lens of resource-based theory (Zhu 2004; Porter and Heppelmann 2014). This theory illustrates how a firm's resource and competence stocks become strategically valuable, or unique and difficult to substitute or imitate, if ICT is adopted and used appropriately (Porter and Heppelmann 2015). More practically, e-Business studies support management in industries such as tourism in optimizing the strategic use of ICTs (Hafeez et al. 2006). *e-Business* is defined as the totality of an organization's computer-supported internal and external business processes (Collechia 1999; Hafeez et al. 2006). In doing so, e-Business studies typically employ three types of evaluative indicators (Zhu and Kraemer 2005; Fuchs and Höpken 2022). (1) Readiness indicators mirror the contextual factors affecting strategic decisions on adopting and using technology in terms of tech infrastructure, like Internet access, WLAN technology, economic resources (e.g., budgets to cover ICT costs, etc.), and human-related aspects (e.g. ICT skills, etc.). (2) Intensity indicators measure the volume and nature of electronic transactions. However, as opposed to adoption

research, technology diffusion analyzes dynamic aspects, thus allowing the early recognition of technological leaps (WPIIS 2005). By cumulating the number of adopters over time, the position on the technology lifecycle of a specific e-Business application can be measured using the typically S-shaped technology diffusion curve (Scaglione et al. 2013). (3) Finally, impact indicators refer to effects induced by e-Business applications in terms of economic wealth, including sales growth; efficiency gains; and improved relationships with tourism stakeholders, customers, and suppliers.

By using a linear structural equation model (LISREL), Fuchs et al. (2010a) estimated adoption and diffusion rates for 11 e-Business applications used by Austrian DMOs. Notably, the readiness factors responsible for the use of e-Business applications most strongly affecting DMOs' value creation were also identified. Interestingly, environmental context and compatible ICT infrastructures emerged as major drivers behind the use of e-Business applications responsible for value creation. As neither cost nor finance-related aspects affect e-Business applications' use intensity, Fuchs et al. (2010a) concluded that once adoption takes place, environmental and technical issues become critical. E-Business applications in the field of enterprise resource planning (ERP) and logistics emerge as the most effective means to improve DMOs' efficiency. Remarkably, the use of e-Business applications in the field of online marketing and distribution can even *negatively* affect DMOs' efficiency. As the integration and impact of technology on organizational performance is seen as a socio-technical issue, the authors (2010a) concluded that technical and organizational compatibility problems between the various application systems need to be resolved to avoid trade-offs between sales and efficiency improvements induced by ICTs (Fuchs and Höpken 2022).

The same framework and analysis method were applied to analyze the relationship between e-Business readiness, intensity, and value creation for the Austrian hotel sector (Witting et al. 2009; Fuchs et al. 2010b). A representative sample revealed that e-Business adoption and use intensity are most strongly affected by the compatibility of ICT systems, firm size, and managers' belief that business processes can be improved by ICTs. Additionally, managers' conviction that guests and tourism suppliers expect latest ICTs favors the adoption of e-Business applications. The dimensions of value creation most heavily affected by e-Business applications are new guest acquisition, increased booking rates, improved quality of relationships with guests, and guest satisfaction (Fuchs and Höpken 2022). Online selling platforms and websites with booking functionalities are among the essential e-Business applications for increasing hotel performance. Again, the least affected value dimension is efficiency, which is measured by cost savings in marketing, procurement, and internal operative processes.

Salwani et al. (2009) obtained similar insights for Malaysian hotels. The use of a LISREL methodology again indicated that competency (technological context), firm size and scope, as well as investments in web technologies (organizational context), pressure intensity (environmental context), and back-end technologies significantly influence the level of e-commerce usage (ibid 2009, 166). Interestingly, while back-end integration was found to function as a mediator, e-commerce experience

moderates the relationship between e-commerce usage and business performance. Thus, hotels with sufficient e-commerce experience are better able to determine what works best to improve business performance by exploring, experimenting, and examining market feedback as well as by learning from the experiences of others.

A recent hotel study by Peco-Torres et al. (2021) demonstrated that online market orientation represents an effective business culture capable of fostering the implementation of key marketing processes to manage customer relationships through revenue management and customer relationship management (CRM). Online market orientation comprises dimensions such as customer orientation (i.e., online media that offer customers useful information about a hotel and the local area) and inter-functional coordination (i.e., online media that detect changes in the sector and coordinate market-facing activities). The study employed LISREL methodology and indicated that online market orientation represents an appropriate business culture to promote the implementation of the two key marketing processes of revenue management and CRM so that they provide mutually beneficial feedback, thus ensuring that long-term customer relationships are developed using quantitatively and qualitatively appropriate customer demand (Sigala 2015).

Studying tourism e-intermediation, Buhalis and Licata (2002) illustrated how major players have made strategic use of ICTs to evolve their e-distribution strategies. Their findings revealed that traditional e-intermediaries – outgoing travel agents (OTAs), tour operators (TOs), and incoming travel agencies (ITSs) – are supported by computer reservation systems (CRSs) and global distribution systems (GDSs). Notably, however, the Internet created new conditions that favor the emergence of new e-Mediaries by strategically using three types of ICTs: the Internet, interactive digital TV, and mobile services. These new intermediaries include organizations such as airlines, hotels, conference organizers, etc. selling directly on the Internet by allowing customers to access their reservation systems, Internet portals, and auction sites. The study synthesizes experts' opinions on the evolution of e-business models and their impact on the change rate of distribution-chain structures and the relationships between tourism demand, suppliers, and intermediaries.

Buhalis (2004) adopted Porter's (2001) value chain model to explain how ICTs digitize airlines' value chain. More concretely, ICTs are supposed to support both airlines' primary (i.e., in-/outbound logistics, operations, marketing & sales, service) and secondary activities (i.e., human resource management, infrastructure, technology development, and procurement). Moreover, Buhalis (2004) stressed the concept of *co-opetition* to demonstrate the strategic relevance of ICTs in supporting airlines to develop their business models and networking strategies (e.g., to form new airlines, no-frill airlines, strategic alliances, etc.). The study provides interesting examples of how airlines use ICTs for strategic and functional activities by digitizing internal operations and external communication as well as services targeted to various external stakeholders, including customers, partners, and suppliers. The study identified the hard and soft impacts of ICTs for airlines and their customers while also recognizing that ICTs empower airlines to address competitive forces. The author also addressed contextual forces such as deregula-

tion, global competition, and demand variations. However, the study was conceptual and provided no evidence of ICTs' impact on airlines' value chain performance.

Yuan et al. (2006) used the 3C model for information systems research (Sigala 2020a) to show how American Convention and Visitors' Bureaus (CVBs) use ICTs to improve their communication, coordination, and collaboration strategies. The authors employed adoption and diffusion theories to classify CVBs based on their strategic use of ICTs, developing an evolutionary model showing the typical paths CVBs follow when integrating ICTs into their value chain operations. This path includes five sequential but recursive stages of how ICTs are strategically used: substitution, enlargement, gestation, reconfiguration, and setback. A previous study by Yuan et al. (2003) in the CVB sector found that organizational capability (i.e., technology-activity fit, leader characteristics, like managers' education, and their perceived usefulness of ICTs) is the major factor influencing the strategic use of ICTs and their impact on organizational performance.

With vast coverage rates and low entry and exit barriers, online auctions show the capacity to augment the distribution potential of businesses in travel and tourism. EBay, the most successful e-marketplace, has become synonymous with online auctions and emerged as a central dynamic pricing instrument (Klein 1997). In fact, a growing number of tourism suppliers sell their services through eBay (Ho 2008). Online auctions are setting prices flexibly based on the dynamic (concurrence) of supply and demand subject to specific market and competitive conditions. For complex (commodities) like tourism services, online auctions allow pricing without prior price estimates. Moreover, online auctions serve as selling mechanisms for products that are difficult to sell, such as the residual room capacities of a hotel or airplane (seats). Finally, online auctions attract large numbers of bidders, representing an effective distribution channel for reaching new (customers). Particularly in rapidly changing environments, online auctions remove the disadvantages of static pricing, thus eliminating excess capacity and increasing sales rates for relatively rare items (price discrimination). Hence, online auctions offer a wide range of strategic opportunities such as reduced transaction costs, a significantly increased pool of bidders through easy access, and timely prolonged auctions. Finally, online auctions serve as a supplementary promotion channel and provide bidding data for BI-based analytics (Höpken et al. 2018).

While online auction research typically focuses on participants' behavior, the optimization of online auction designs, the integration of online auctions in ongoing operations of the firm, and the learning from the vast amount of transaction and bidding data through BI-based analytics, online auctions research in tourism is scant (Ho 2008; Fuchs et al. 2008, 2011a). The adoption and impact study by Fuchs et al. (2014b) identified the factors that determine the strategic adoption and use of online auctions in the hotel sector. Firstly, according to survey data from the Austrian hotel sector and logistic regression, security concerns regarding nonpaying buyers and retractions from bids and compatibility concerns with the existing ERP system emerged as major adoption barriers. Secondly, the study elucidated how the use of online auctions affects hotel performance. Partial least squares (PLS) technique was used to show that in the eyes of Austria's hotel managers, online auctions (especially

last-minute auctions) positively affect sales figures (i.e., increasing booking rates and new customer acquisitions). Additional benefits such as increased customer satisfaction and data for BI-based analytics were recognized as well.

When summing up, we observe that contemporary strategy literature limits organizational performance to three major areas (Richard et al. 2009): (1) financial performance (e.g., profits, ROI, return on assets, etc.), (2) product market performance (e.g., sales, market share, customer satisfaction, etc.), and (3) shareholder return (e.g., economic value added, etc.). Interestingly, only one tourism study on the relationship between the strategic use of ICTs and organizational performance employed such a restricted concept of organizational performance (Peco-Torres et al. 2021). The other studies reviewed engaged with broader concepts of organizational performance. For example, beyond sales growth, efficiency gains, and enhanced customer satisfaction, the framework proposed by Fuchs et al. (2010a,b) and Fuchs (2004) comprises the improved quality of relationships with tourism stakeholders and suppliers. Similarly, Buhalis and Licata (2002) employed an all-encompassing performance concept referring to aspects of security issues, customer alienation, trust-building, information overload, and human contact. Finally, Yuan et al. (2006) traced multiple dimensions of organizational performance, such as the scope of activities and type of interpersonal connections. Notably, this study took a processual perspective, focusing on change processes triggered by ICT use. The nexus of ICT diffusion in a regional tourism network and the nature of change processes was also analyzed by Braun (2004). Interestingly, Braun (2004) identified a strong relationship between ICT diffusion and network positioning in terms of both place (i.e., status and position in the network) and space (i.e., geographic makeup of the network). In turn, ICT diffusion is strongly affected by network cohesion, such as actors' engagement and trust in the network. Consequently, although ICT adoption and use in tourism is highly driven by the interorganizational and international scope and features of the tourism product and industry, research on the strategic value of ICT in tourism is limited to measuring impacts at an organizational rather than an ecosystem level. As the importance and responsibility of tourism in achieving sustainable benefits that surpass the organizational level to address the well-being of communities and livelihoods has significantly increased in the post-COVID-19 period, it is imperative that future research considers the strategic use and impacts of ICTs in generating value at an ecosystem level.

Unraveling the ICT Productivity Paradox in Tourism

While strategic investments in ICTs involve several risks and considerable costs, they guarantee neither corporate success nor increased productivity (Buhalis 1998; Sigala et al. 2004). After briefly introducing the concept of *productivity*, this section presents the causes of volatile productivity effects, known as the ICT Productivity Paradox. Major studies analyzing the relationship between ICT investments, strategic ICT use, and volatile productivity in tourism are reviewed to discuss strategic

adjustments of capabilities and organizational structures firms may undertake to make best use of ICT-enhanced business value.

Defined as the ratio between outputs and inputs in a production process, productivity quantifies how well production processes transform resource inputs into outputs. By contrast, efficiency is connected to the question of how particular input resources are utilized. More formally, allocative efficiency is (technically) achieved when the "marginal productivity per unit" is equated across all resources that contribute to a firm's output (Keh et al. 2006, 266). Thus, efficiency emphasizes the difference between the minimum resource input theoretically required and the level of resources actually used. Finally, effectiveness is concerned with determining which strategy, among all those that are theoretically possible, maximizes long-term ROI (ibid 2006).

In line with these definitions, Tangen (2004) described efficiency as "doing the things right," whereas effectiveness is about "doing the right things" or reaching set goals according to strategy. More practically, a gain in productivity can be achieved because output increases more rapidly than inputs or because there is a decline in the use of inputs while outputs are kept constant. Economists typically define ICTs as producing durable goods to substitute expensive resource inputs and to boost firms' competitiveness (Tangen 2004). Typically, this is achieved through process reengineering and by combining ICTs with other innovations. However, in service industries like tourism, corporate success depends on the degree to which internal efficiency (i.e., cost-effective use of operative resources) and external efficiency (i.e., customer convenience in human encounters of value co-creation, such as promptness, punctuality, empathy, etc.) can be improved (Fuchs 2004; Grönroos 2008; Neuhofer 2016). Nonetheless, due to difficulties in conceptualizing and measuring external efficiency, service productivity concepts often remain rooted in the paradigm of mass manufacturing (Grönroos and Ojasalo 2004; Joppe and Li 2016).

As highlighted, the multifaceted and complex relationships between ICT investments and the multidimensional nature of corporate performance in tourism firms lead to volatile productivity effects and are therefore poorly understood. This situation of marginal, stagnating, or even *negative* productivity gains despite significant ICT investments is known as the ICT Productivity Paradox (Brynjolfsson and Hitt 1998). Existing literature has highlighted a number of explanations for diverging results between ICT investments and productivity gains which can be grouped as follows (Sigala 2003a,b; Grönroos and Ojasalo 2004; Scholochow et al. 2010, 14):

- *Measurement problems* are due to varying productivity concepts and indicators; differing definitions and amortization rules for ICTs; the insufficient representation of ICT-based service processes in corporate balance sheets and official statistical bureaus; differing measurement methods, including inconsistent sample periods and analysis levels (i.e., firm, sector, and country level; objective vs. subjective performance metrics; hybrid approaches); and resistance to adopting and using technology (Pourfakhimi et al. 2019)

- *Analysis problems* are due to differing analysis methods when empirically estimating the ICT Productivity Paradox, including econometric methods, such as stochastic frontier analysis versus extreme point methods, such as data envelopment analysis (Joppe and Li 2016)
- *Time lags* are due to organizational adjustments, including new domains of task responsibility as well as competence and training requirements, e.g., for new types of BI-based analytics for big data (Mariani et al. 2018; Sigala 2020a), de-/recentralization and reallocation of business processes (in-/outsourcing), and redistribution of productivity gains within the organization (Espino-Rodriguez and Padrón-Robaina 2005)

Tourism literature contains a number of studies capturing the impact of ICTs on firms' efficiency that have thus far reported inconclusive findings regarding the ICT Productivity Paradox (Johns et al. 1997; David et al. 1996; Tarim et al. 2000). The study by Ham et al. (2005) on upscale hotels, for example, reveals that front- and back-office applications as well as restaurant and banquet management systems positively affect the productivity of lodging operations. However, guest interface applications were found to be insignificantly related to hotel productivity. Given the difficulty of capturing the *intangible* benefits of ICTs for customer services, this finding is not fully surprising. Tourism scholars, therefore, have stressed that the ICT Productivity Paradox is mainly a methodological artifact (Sigala 2003a; Sigala et al. 2004; Scholochow et al. 2010).

A widely used technique to measure operational efficiency is data envelopment analysis (DEA). It compares the efficiency of multiple economic units (e.g., operational units, hotels, destinations, etc.) producing similar (e.g., tourism) services by considering the transformation of multiple inputs to produce multiple outputs (Cooper et al. 2000). Data envelopment analysis is a nonparametric method that constructs a stepwise linear frontier function (Zhu 2009; Fuchs and Höpken 2005). Formally, the efficiency h of a particular unit i is obtained as a solution to the problem: maximize the efficiency h of unit i under the restriction that the efficiency of all units n is ≤ 1. Hence, the upper efficiency limit is fixed at 100%. After the fractional objective function has been restated as a linear function, efficiency results can be gained by solving the (primal) linear programs (LP) for each unit n. Finally, more accurate and realistic variable returns to scale (VRS) are obtained after adding a convexity constraint to the LP's dual version (Cooper et al. 2000; Fuchs 2004).

Various scholars have applied DEA to study the ICT Productivity Paradox in tourism. Sigala (2003a) and Sigala et al. (2004) developed a DEA methodology that addressed previously unsolved limitations, including the way ICTs are measured using metrics diverting from ICT investment costs to ICTs' nature and types of use; the way productivity is measured to reflect ICTs' operational and market impacts and their "soft" and "hard" benefits; the simultaneous considerations of multiple ICTs and productivity metrics in relation to productivity redistribution effects; and the impact of ICTs on interlinked value chain operations rather than on isolated operational domains. Sigala's (2003a) and Sigala et al.'s (2004) DEA model was validated in the hotel and restaurant sectors (Sigala 2003b). Findings showed that

firms could not accrue ICT benefits by simply investing in ICTs but must effectively embed and integrate ICTs into multiple business operations. Thus, it is not the monetary amount of ICT investments or even the type of ICTs used but rather the type and nature of ICT usage and its alignment with business operations and strategies that sustainably boosts firms' performance. Notably, strategic ICT usage leading firms to outperform is found particularly in ICT usage types related to firms using ICTs to collect and analyze data to make informed decisions and to network internally and externally for optimizing, streamlining, and reengineering operations and resources within and beyond organizational borders.

Shang et al. (2008) applied DEA methodology to analyze the impact of ICTs on hotel performance. The authors found no efficiency effects related to the ICT adoption status of international tourist hotels in Taiwan, thus providing evidence for the ICT Productivity Paradox. The authors concluded that the ability of a hotel to transform inputs into outputs is not only affected by controllable inputs but also uncontrollable phenomena (ibid 2008, 539). Inspired by this and Sigala et al.'s (2004) work, a three-stage DEA model to estimate ICTs' impact on productivity gains in Austria's hotel sector was proposed by Scholochow et al. (2010). The three-stage method allowed separate evaluation of (1) allocative efficiency from expenses devoted to various ICT applications (i.e., input minimization), (2) the effectiveness of ICTs in maximizing hotel output (i.e., output maximization), and (3) the assessment of overall productivity by relating total outputs to total resource inputs. The hypothesis that ICTs are more effective at generating revenues than other hotel resources was tested by the difference between effectiveness and productivity gains measured by the respective variable returns to scale (VRTS) of individual hotels (Keh et al. 2006; Scholochow et al. 2010). Secondary data for outputs (i.e., sales revenues [RevPar], overnight stays) and inputs (i.e., no. of employees, beds, operation, and marketing expenses) and subjective data from a survey of over 3,600 Austrian hotel managers on their adoption context and productivity gains induced by ICTs were considered. Interestingly, for two adopter groups, findings could falsify the assumptions of the ICT Productivity Paradox by revealing that strategic ICT use leads to higher hotel productivity. More concretely, ICTs are capable of increasing returns to scale even for *inefficient* hotels from the advanced and weak ICT adopter groups. However, no significant productivity gains from ICT use were shown for the group of intermediate ICT adopters. Thus, the findings revealed a highly polarized ICT adoption behavior, with intermediate adopters displaying the least differentiated and most inconsistent strategies for ICT adoption as well as organizational adaptation.

When addressing the ICT Productivity Paradox in tourism, researchers have found that firms need to undertake major adjustments to both capabilities and organizational structures to make full use of the ICT-enhanced business value. Buhalis (1998) highlighted the crucial need for long-term planning, an innovative organizational culture, business process reengineering, (top) management commitment, knowledge management, and training throughout the hierarchy as major managerial and organizational prerequisites. Following this recommendation, a valuable proposition to support ICT-related strategy development at the destination

level was proposed by Moreno et al. (2015). Because of the assumed structural equivalence of a web-based network and a destination's cooperation strategy, the authors proposed an open service platform which serves four major strategic purposes: (a) creation of critical mass to increase distribution possibilities, (b) facilitation of innovation processes, (c) empowerment of local tourism organizations to cooperate with non-tourism firms, and (d) the collection of valuable big data sources for tourist behavior analysis (Mariani et al. 2018). While the proposed open service platform integrates a uniform data exchange format (data harmonization) as well as a comparison and a booking platform, it is conceptually defined as an intelligent service bus offering open interfaces to the various destination players (Moreno et al. 2015, 414). An important finding of this study is the importance of the development of an innovative ecosystem with the capacity to avoid paradoxical spirals of dependencies from dominant online travel agents (OTAs) and search marketing providers (see also Boes et al. 2016).

Studies of the ICT Productivity Paradox in tourism literature – with a few exceptions (Sigala 2003a,b; Sigala et al. 2004; Scholochow et al. 2010) – still employ rather simplistic productivity concepts and analysis frameworks rooted in the mass-manufacturing paradigm. Although they engage indicator frameworks to assess mainly supply-side and tangible aspects related to (multiple) outputs and input resources, little emphasis is put on intangible and customer−based inputs, throughput, and output dimensions affected by ICTs. To overcome these limitations concerning the adequate conceptualization and measurement of *external* efficiency, complex customer processes of value co-creation and co-destruction need to be considered in ICT-related productivity assessments, ideally through the inclusion of subjective measurement metrics (Fuchs and Höpken 2005). In fact, Sigala (2003a,b) and Sigala et al. (2004) highlighted the relevance of metrics going beyond ICT investment costs to reflect the particular nature and type of ICT usage. In this way, metrics can grasp both the soft and hard benefits for multiple stakeholder and customer groups, given that ICTs may create value for one actor but destroy value for another. Hence, future research in ICT valuation should simultaneously assess ICTs' operational and value-generation impacts, considering both value co-creation and co-destruction effects within an ecosystem, rather than exclusively at the level of single actors (Sigala 2018).

Regarding the analytical focus of previous studies of the ICT Productivity Paradox in tourism, the dominant level of analysis is the level of the firm. Destination-based, inter-sectoral and cross-country assessments of ICT-induced productivity effects are limited. Moreover, regarding sampling and data, the literature review reveals a predominance of studies using cross-sectional data. However, time-lagged productivity effects – such as those due to required upskilling and substantial learning needs, slow acceptance to use new ICTs, and significant organizational adjustments, including de-/recentralization and re-allocation of business processes through in and out-sourcing – cannot effectively be detected by analytical methods that rely mainly on cross-sectional data. Instead, methods for panel data analysis, such as multilevel modeling using time series and panel data, would more adequately reflect time-lagged productivity effects.

Indeed, rather than a failure of ICTs themselves, the ICT Productivity Paradox mirrors the failure to understand ICTs' capacities to affect the complex and multifaceted factors of firm performance. Thus, the assumed utility value of ICTs in boosting short-term profitability sharply contrasts with ICTs' value proposition as strategic asset assuring sustainable firm survival. While the former perspective views ICTs as a freely available and homogenous resource that can readily be copied, the latter views ICTs' value as path-dependent and shaped by the unique set of heterogeneous, dynamic, and inimitable human capabilities of an organization (Barreto 2011, Bareto 2010). As long as ICTs are seen as exogenous and isolated input resources with an assumed direct impact on firm performance, the focus remains erroneously on ICT possession and (Ricardian) rent seeking. By contrast, if ICTs were viewed as endogenous and tightly coupled with a firm's capabilities, they could become a source of evolutionary (Schumpeterian) rents, wherein their cumulative impact enables other firm's assets to become strategic as well (Webb and Schlemmer 2008). The latter is achieved by improving external efficiency in co-creating customer value through *virtual* economies of scale and scope (Fuchs 2004; Polo-Pena et al. 2013; Grönroos 2008; Neuhofer 2016).

As highlighted, Sigala (2018) showed how advances in ICT development have dynamically transformed the ways tourism actors co-create and co-destruct value as well as disrupt, restructure, and redefine how tourism organizations and sub-industries operate and perform. To understand the strategic transformation processes behind value co-creation in tourism, Sigala (2018) claimed that additional multi-disciplinary research and even anti-disciplinary thinking are required, as new value co-creation and co-destruction processes may not fall into existing paradigms, disciplinary silos, or mindsets. The continuous advances of ICTs and, more importantly, the creative use of ICTs by tourism actors for co-creating value will demand more than ever new mindsets to research and understand the *transformative* role of ICTs in value creation and their impact on the performance of tourism firms and the entire tourism ecosystem (see also: Gretzel et al. 2015a).

Critical Discussion

The insights gleaned from the literature on the strategic use of ICTs in tourism reviewed and synthesized in this chapter indicate the following research gaps and needs.

Firstly, in terms of the general significance of studies on the strategic use of ICTs in tourism, the broader tourism literature does not sufficiently debate the strategic role of ICTs but only emphasizes this role occasionally and superficially. For example, Tribe's (2010) textbook *Strategy for Tourism* devotes only two and a half pages to tourism organizations' technological environment (Tribe 2010, 78–80) and refers exclusively to Buhalis and Law (2008). Likewise, Crouch and Ritchie's (1999) framework for destination competitiveness vaguely refers to management information systems by stating that the "information component of destination management pertains to the [. . .] effective use of information systems that provide

managers with the information required for understanding visitor needs and for effective product development" (ibid 1999, 149).

Secondly, the majority of past tourism studies on the strategic use and impact of ICTs engage with relatively advanced concepts to operationalize and measure organizational performance. Examples are ranging from improved quality of relationships with stakeholders and suppliers (Sigala et al. 2004; Fuchs et al. 2010a,b) to reduced information overload (Yuan et al. 2006), reduced customer alienation and security issues (Buhalis and Licata 2002), as well as e-network cohesion and trust-building through tourism stakeholders' strategic engagement with ICTs (Braun 2004).

Thirdly, the majority of ICT-related strategy work in tourism is grounded in the structural-functionalist-positivist (SFP) research tradition (Joullié 2020). Following this paradigm, theories are proposed and used to predict the behavior of a phenomenon which is assumed to be inherently "determined"; thus, the phenomenon can be described by sufficiently stable patterns, what ultimately allows for control. Notably, modern sciences base their legitimacy (Joullié 2020, 2) on this instrumental quality, described by Lyotard (1984) as *performativity*. Thus, to acquire the status of an acknowledged scientific discipline, management and strategy researchers (not only in tourism) propose theories as "testable propositions capable of describing organisational phenomena with the aim to predict the occurrence and progress of comparable ones" (Joullié 2020, 2). In fact, strategy researchers study managers' behavior and technology use as well as strategic consequences in the hope of identifying *regular* relationships between them. Once identified, such "patterns" are codified as theories or formalized as "expectations that identical consequences will follow, should the same managerial behaviour be repeated" (ibid 2020, 2).

According to the SFP tradition, organizations and their characteristics – hierarchies, technologies, employees, processes, suppliers, customers, and inputs and outputs – are "nothing but structures that embody causally effective functions on other structures, irrespective of the intentional state of the individuals that animate them" (Joullié 2020, 8). Thus, individuals do not exist as autonomous human beings but as mere structural components and substructures of the socio-institutional phenomenon under study. In addition, the functional behavior of these structures is amenable to objective observations that in turn ensure the value neutrality of the resulting strategy theories (ibid 2020, 9). Importantly, this paradigmatic view ignores any explicit *value* judgments (e.g., ethics) by focusing solely on the *facts*, defined as intersubjective sense data from observations assumed to exist as bijective relations to objectivized (e.g., organizational) phenomena, from which theories can be inductively inferred and compared to new observations by means of prediction and experiment (ibid 2020, 8; Ghoshal 2005; Putnam and Walsh 2014). However, while strategy research rests on the paradigmatic assumptions and objectives of the natural sciences, the idea that managers can identify and develop appropriate strategies based on a formal body of theoretical knowledge seems highly unrealistic (Joullié 2020, 6).

Thus, the more pluralistic epistemology of the knowledge-based theory of strategy initially seems capable of moving beyond the positivist-monist conventions of

contemporary strategy research, offering theories less about "objectified entities 'out there,' rather than sets of contextualized heuristics guiding managers' intervention in their organizations as quasi-autonomous social systems" far away from any state of equilibrium (Spender 1998, 233; Reihlen and Ringerg 2013). Examples of the strategic use of ICTs playing a significant role in assisting tourism managers in promoting knowledge creation and corporate learning include the studies by Gretzel and Fesenmaier (2001), Sigala (2003a,b, 2018), Sigala et al. (2004), Yuan et al. (2006), Salwani et al. (2009), Fuchs et al. (2010a,b, 2013, 2014a), and Höpken et al. (2011, 2015). However, these strategy researchers – knowingly or not – accepted a structuralist paradigm by assuming the existence of stable and superordinate arrangements of organizational reality (though buried in human consciousness, attitudes, and capabilities), which they attempted to discover and codify (Joullié 2020, 10). In fact, these studies seem to accept these underpinning ordering and stable features of organizational reality through which prediction and control of organizational phenomena are possible, because without it, the *performativity* of the research could not be justified (ibid 2020, 11). It seems that tourism scholars find it difficult to disentangle the dominant structuralist paradigm of management research and education as the latter frames and shapes their way of thinking and researching (Pearce and Huang 2012).

That said, strategy scholars not only in tourism apparently suffer from a "natural sciences envy" (Bygrave 2007, 25) that has led to a "managerial bias" (Joullié 2020, 11) in seeing the ultimate objective of strategic management as providing the means and tools (i.e., theories and frameworks of organizational success) for managers to exercise executive control and organizational regulations to achieve maximum organizational performance (Ghoshal 2005; Ezzamel and Willmott 2010). Therefore, postmodern strategy scientists (i.e., post-structuralists) distance themselves from this paradigm because they are suspicious of management science as a predefined instrument of social control and oppression (Cornelius and Laurie 2003; Gibson-Graham 2014). Postmodern strategy scientists deny societies' (and organizations') neutral and stable existence by rejecting the idea that institutions and related symbols have fixed meanings derived from permanent entities (Joullié 2020; Vaara 2010). Rather, they "analyse these components of social experience as repressive processes silencing other institutions, symbols, and texts, while promoting the agendas of their incumbents" (Joullié 2020, 12). Certainly, such a critical stance is of merit (ibid 2020, 12). However, due to its anti-epistemological posture and the assumed absence of stable, causally effective social structures, there is not much room left to develop explanations of organizational phenomena that are predictive and performative (ibid 2020, 13). Indeed, through a post-structuralist view, explanations of organizational events seem impossible as they are driven by the choices of individuals whose behavior is inherently unpredictable, especially if the idea of humans' free will is accepted. This implies, however, that causal and performative theories of strategy have to assume a certain degree of (e.g., psychological) determinism (ibid 2020, 14). Nevertheless, even structuralists argue that strategic and organizational decisions are contingent on phenomena over which managers have little or no control, such as general socioeconomic conditions,

competitors' offerings, legal constraints, or stakeholders' expectations. However, "can then be such a thing as strategic choice and decision?" (ibid 2020, 11). Managerial free will, irrespective of whether it exists, is then of negligible consequence (ibid 2020, 13).

Strategy researchers in tourism reflect too little on the assumed psychological determinism of theories modeling human agency, leaving little room for concepts like corporate social responsibility and business ethics (Dierksmeier and Pirson 2010; Sigala 2018; Gössling and Hall 2019; Higgins-Desbiolles 2020; Gretzel et al. 2020). Rather, the dominant contemporary structuralist paradigm applied to study organizational reality is "obfuscated behind a cloud of ambiguities, tautologies, circular reasoning and imprecise language" (Joullié 2020, 14). For example, in current strategy work, the frequently stressed concept of "authority" (e.g., of managers, leaders, CEOs, shareholders, etc.) is typically undefined. While the *Merriam-Webster Dictionary* defines authority as the "power to influence or command thought, opinion, or behavior," strategy authors would make the often detrimental implications of their theories more apparent if they clarified the meaning of authority by using a less ambiguous word (ibid 2020, 15). In fact, etymologically, the notion of strategy traces back to the Ancient Greek word *stratēgos*, which combines *stratos* (army) and *ago* (leading) to refer to a military commander (Ghemawat 2001). Hence, in its original sense, the term points to the art of leading military troops, including such skills as laying siege, deceitfulness, tactics, and so on (Freedman 2015). Only since the second half of the twentieth century has strategy become an umbrella term to describe how a business competes, what its goals should be, and what policies and resource combinations are needed (Chandler 1962; Porter 1980). Nevertheless, its original meaning still echoes in the art of combining means (i.e., resources and humans) to win a market battle, often outlined as the ultimate end.

Moreover, imprecise language in strategy research is found in tentative statements describing findings, such as "X may cause Y" and "X potentially triggers Y" (Joullié 2020, 17). This vague language implies that *Y* does not necessarily follow from *X* and that something else – or nothing at all – could follow (ibid 2020, 17). Thus, despite promises to identify and codify theory, strategy scientists have been incapable of doing so (Joullié 2018). Strategy researchers' circular reasoning becomes evident when they identify "competitive advantages" and "valuable resources" *exclusively* within successful organizations, although these concepts cannot fully explain organizations' performance. Nevertheless, Porter's theories on ICTs' role in sustaining competitive advantage (Porter 2001; Porter and Heppelmann 2014) suggest that competitive advantages or valuable resources produce organizational success. However, "assuming that valuable resources produce organisational success amounts to implying that organisations are successful because they are successful" (Joullié 2018, 16). While this performative proposition is true, it is trivial and does not state a theory but rather a tautology (ibid 2020, 16).

A final aspect neglected by strategy authors – in tourism and other fields – is the assumed determinism of stressed motivation theories (Joullié 2020, 15). Following the functionalist language associated with the structuralist paradigm, motivation is

defined as "the set of *forces* that *causes* people to engage in one behavior rather than some alternative behavior" (Griffin and Moorhead 2012, 90). Accordingly, motivated people, such as employees or (coproducing) customers, entrepreneurs, managers, and business leaders, do not act but react. They are "inescapably" caused to behave as they do (Joullié 2020). However, in ordinary language, motivation has a very different connotation and refers to the reason (e.g., ethical principles) one acts in certain ways. This more realist and practical understanding of the term makes room for real choice and free will. If motivation is a reason for action (as opposed to a cause for reaction), then one can always *creatively* change one's behavior (and related mindsets) by changing one's motivation (Joullié 2020, 16; Fuchs and Baggio 2017; Stirling 2020; Brodbeck 2011a,b; Fuchs et al. 2021).

Indeed, strategy models proposed in the domain of e-tourism provide inadequate solutions for dealing with broader societal and ecological problems. Only a few scholars in the (e)-tourism field (Hall 2010; Sheldon and Daniele 2017; Sigala 2018; Gössling and Hall 2019; Higgins-Desbiolles 2020) and else (Ghoshal 2005; Dierksmeier and Pirson 2010; Pearce and Huang 2012; Joullié 2020) have shown that management and strategy studies currently face a serious crisis of theory that has led to an existential crisis of its legitimacy (Joullié 2020, 18). A transformative (Gretzel et al. 2020; Sigala 2020b) and less theory- and discipline-focused (Sigala 2018) strategy scholarship in e-tourism should, thus, emerge and substitute the outdated tradition of structuralist strategy research. While organizations are made of people instituted to provide meaning to people, strategy research in tourism needs to be more strongly oriented around a truly social reality shaped by the manifold stakeholders' *values* and *motives*.

Like our ancient philosophical ancestors, who never studied issues of strategic thinking and leadership independently of community values and principles related to democracy and citizenship (i.e., the *studia humanitatis*; Joullié 2020, 19), strategy scholars in tourism should more strongly document how and based on which (i.e., ethical) values, business leaders in tourism make sense of their human experiences and interactions when making strategic decisions related to ICTs (ibid 2020, 19). Indeed, the study and practice of strategic management in tourism is, primarily, a *linguistic* activity (Webb and Schlemmer 2008; Ross and Chiasson 2011), therefore requiring speaking clearly and convincingly about matters of ethical and ecological relevance related to the sociocultural phenomena of travel, tourism, and hospitality (Joullié 2020, 19; Ardelt et al. 2020). However, this "endeavour is impossible in the obscurity of imprecise language and in the absence of moral and aesthetic references" of contemporary strategy research and practice (Joullié 2020, 19).

Nevertheless, strategy defined as an inter-discursive phenomenon recalls Habermas' (1984) theory of communicative action differentiating between two types of language use, namely, *communicative* and *strategic reasoning*. Anthropologically, the former is the original speaking mode of pre-patriarchal societies and is oriented toward mutual conflict resolution through compromise and harmonization of plans of action (Smith 2014; Göttner-Abendroth 2013, 2017). Conversely, the latter is purposive-utilitarian by nature and thus inherently instrumental, often manipulative, and therefore less socially and morally desirable (Schaefer et al. 2013; Fuchs 2019).

Indeed, concepts of both every day and scientific language constantly emerge from intersubjective creative processes embedded into the social system of habits and customs of thought and experience. As such, words and language-based concepts are creatively related to each other by being socially corrected through only *negative* differentiation. Indeed, the failure of analytical philosophy indicates that concepts of the world cannot be *positively* defined exactly because self-identical and everlasting things do not exist (Wittgenstein 1984). Nevertheless, social reality can "function" through linguistic signs only if the meaning of beings is sufficiently clarified, shared, and believed. However, language used in such a *dualistic* way to express existential propositions of a seemingly stable world risks confusing notions and concepts like strategy, technology, or money and the (self-)recognizing and acting ego as *durable* entities (Brodbeck 2011a; Putnam and Walsh 2014). Indeed, the continuous construction and use of language is less driven by objective facts, but by people's *motives* grounded in beliefs and ethical principles and values. Philosopher and mathematician Kurt Gödel (1930) showed that any system of logic can be formulated only *after* the meaning of "beings" has been sufficiently clarified ontologically, because a logical system's existential quantifier can never be assumed to presuppose any definite meaning (ibid 1930). This is also the reason mathematical models, which are typical in a structuralist approach to strategy research, cannot adequately represent human endeavors.

Conclusion and Research Outlook

When it comes to sketching future strategy research in the e-tourism field, the mastery of a communicative language in Habermas' (1984) sense would support the use of ethically grounded reasoning that focuses less on performativity (Lyotard 1984). This would encourage critical thinking to assessing *implicit* ethics, typically camouflaged by strategy theories' and ICTs' assumed "value neutrality" (Brodbeck 2011b; Allen 2016; Joullié 2020). Only a handful of tourism scholars, such as Sigala (2018, 2020b), Gretzel et al. (2020) and Gössling (2021), have provided valuable frameworks showing how, in a post-pandemic world, the ontological and axiological assumptions of theories for understanding and motivating the strategic use of ICTs in tourism can be critically assessed to bring about humanist alternatives to the current dominant structuralist science paradigm, which has likely degenerated as a mere profit-technology. Rather than trying to predict organizational phenomena, strategy scholars in the field of e-tourism should aim to understand these phenomena and help tourism firms to reshape as well as reset social practices to promote common well-being (Sigala 2020a). There is an increased need for tourism strategy researchers to inspire *change* and betterment through transformative research (Gretzel et al. 2020). Instead of searching for causes, they should explore and clarify reasons – especially those leading to executive choices and managerial actions – by considering objectives, situational constraints, ethical considerations, and material contingencies (Reyes et al. 2017). More concretely, future work on the strategic use of ICTs in tourism should be directed toward making predominantly

micro and small-sized organizational realities value- and virtue-driven, e.g., through local community and family-oriented entrepreneurs (Long and Mathews 2011; Smith 2014; Vasquez 2018). Following digital entrepreneurship (Zaheer et al. 2019; Neirotti and Raguseo 2017), e-tourism literature so far has brought out only a few examples that highlight ICTs' capacity to secure micro and small-sized tourism firms' survival by strengthening entrepreneurs' transformative values that favor corporate social responsibility (Mbatha 2013). Regrettably, e-tourism scholars recently even complained about "the lone digital tourism entrepreneur" (Alford and Jones 2020), described by difficulties in creating realistic expectations from technology use and using technologies directly applicable to existing micro- and small-scale grown business models. However, following positive organizational scholarship (Cameron and Quinn 2011), tourism organizations should not be studied from such a deficiency perspective but rather from the perspective of abundance by identifying reasons (not causes) explaining positive deviance and unusually favorable outcomes like collaboration, human well-being, vitality, and meaningfulness. Instead of competitively outperforming other tourism firms through the use of ICTs, the focus of transformative strategy research and practice should shift toward organizational members' loyalty, compassion, honesty, respect, and forgiveness. Research should also focus on the improvement of social relationships and interactions characterized by trustworthiness, resilience, wisdom, humility, and the levels of positive energy to foster socioeconomic flourishing (Cameron et al. 2003; Werthner 2019; Ardelt et al. 2020). In short, transformative e-tourism strategy research should help industry professionals understand not only *how* to act but also *why* to act by helping them to define actions favoring authentic purposes of socio-ethical being and behaviour.

In this regard, it is imperative to note that Nordin and Hjalager (2017) contrasted two modes of innovation in tourism organizations: science, technology, and innovation and doing, using, and interaction. In the former, typical for large organizations, the innovation project is strategically chosen, technology-driven, and led by scientific staff. In the latter, typical for micro and small-sized tourism firms, innovations emerge as spontaneous responses to opportunities and constraints driven by human concerns and are led by experience-driven teams in flexible and benevolently creative networks, thereby holding responsible and transformative potential (Fuchs et al. 2021). Indeed, the contradictions and paradoxes of current dominant types of organizational culture, such as hierarchies (i.e., oriented toward control and driven by the value of efficiency) and markets (i.e., oriented toward competition and driven by the values of market share and profitability), need to be surpassed (Cameron and Quinn 2011). This change can happen in organizations oriented toward collaboration, trust, and community building that are driven by values based on transformative vision, communicative reasoning, *benevolent* creativity, and agility. Strategy scholars in the e-tourism domain should therefore integrate theories of nonmarket strategy research (Mellahi et al. 2016), like stakeholder and social institutional theory, theories of social transformation and contracting, as well as social and lifestyle entrepreneurship (Sheldon and Daniele 2017; Fuchs et al. 2021). Important research questions should comprise the following: why and

through which ICT-related strategies can tourism entrepreneurs support sharing economies (Gössling and Hall 2019), slow tourism (Laven et al. 2019), regional circular economies, and degrowth (Hall 2010; Higgins-Desbiolles et al. 2019)? What are managers' *normative* assumptions behind concepts of organizational strategy and performance? How do value-laden processes, like democracy, government, citizenship, place identity, peace, etc., affect managers' strategy building and decision-making (Shepherd 2021)? How can ICT use be aligned with United Nations' Sustainable Development Goals? (Ali and Frew 2014; Werthner 2019; Gössling and Hall 2019). It is crucial for future strategy research to understand technology not as an inevitable outcome of a determinist evolution (Allen 2016) but rather as a "historically and culturally shaped meaning relation of man to his tools" (Samerski 2018, 1639). However, because of the continuous equipping of humans with "productive technological tools," the relation between people and their instruments has inverted and technology more and more forces people to behave like machines (Illich 1975). While ICTs and humans should not be seen as separate entities, future studies should increasingly emphasize the socio-technical nature of ICTs, applications, and their uses (Gretzel et al. 2020, 193). Indeed, ICT adoption, usage, and impacts are inseparable from the way humans see, perceive, use, and embed ICTs into their daily social and professional lives.

With regard to ICTs, it is also imperative to grasp the subtle meaning behind the concepts of data, information, and knowledge. Firstly, data is derived from the Latin *datum*, denoting something given. When related to information, this term suggests the possibility to always have more knowledge about something. However, information traces back to the Latin *informare*, which means "to give form to" (Mirowski and Nik-Khah 2017). In the Cartesian worldview, information came to define truth not only in scientific disciplines, such as classical physics, but also in modern economics and management sciences, thereby, however, replacing the *conscious* aspect of knowledge. More precisely, neoclassical economists like Friedrich v. von Hayek (1967) appropriated the arguments from Shannon's information theory (1949) and cybernetics "to eliminate the ability of human subjects to know much of anything, arguing against intervention into markets because of the ignorance of economic agents" (Bollmer 2018, 170). However, Shannon's use of information only quantifies the probability that a specific bit, byte, or word would come after another. Engineers can then calculate the minimum requirements for the accurate transmission of a message to be understood. Notably, Shannon's information has nothing to do with *meaning* and instead transcends the inherently open and creative structure of language to describe anything modeled into a sequential pattern that could have a form (Bollmer 2018, 170). Although Shannon's mathematical theory of communication clearly states that "semantic aspects of communication are irrelevant to the engineering problem" (ibid 1949, 31), the concept of information was inappropriately applied to disciplines like economics, management, and even philosophy, removing previously central aspects of humans' conscious interpretation and sense making. Ironically, the turn to information in economics reframed questions of truth as best solved by "the greatest information processor known to humankind – namely, *The Market*" (Mirowski and Nik-Khah

2017, 7). However, if the market becomes that which determines "truth," then what role do economists (and strategists, software developers, policy makers, etc.) play? How do they define their value in terms of shaping and creating policy (Bollmer 2018, 170)? The ironic answer is by creating markets! "If markets, indeed, validate truth, then the cadre that gets to construct the markets gets the final say on the nature of truth" (Mirowski and Nik-Khah 2017, 7–8). The invisible hand is then unmasked as a visible fist that governs the world and invalidates democracy by disempowering citizens in the face of the market (Skidelski 2020).

This highlights the challenge of transformative e-tourism research beyond COVID-19 (Gretzel et al. 2020). Instead of perpetuating the money fixation typical of neoliberal growth societies and related patriarchal systems through manipulative information technologies and strategy frameworks (Drnevich and Croson 2013), the future focus should be on ICTs that support community-oriented forms of tourism production, thereby strengthening consensus-seeking, engagement, participation, and transparency (Hall 2010; Eisler 2013; Higgins-Desbiolles et al. 2019). In this way, the current anthropocentric view and industrialized style of tourism production should be overcome (Gössling and Hall 2019), and the manifold cultural forms of hospitality should again become more visible and vivid. In a truly smart tourism context, ICTs dissolve traditional market concepts and roles. Smart technologies are supposed to secure the seamless interoperability of all stakeholders, thereby creating a new type of "intelligence to tourism ecosystems" that makes them "sensitive and adaptive to stakeholders' human needs" (Buhalis 2020). Open source and open access technologies as well as community-related business models supporting the creation and protection of digital and physical *commons* will play a crucial role in this transformative process (Tavakoli et al. 2017; Sigala 2018).

As mentioned, future research on the strategic use of ICTs in tourism has to focus on the micro-foundations of the strategy process. By renouncing the value neutrality associated with the structural-functionalist-positivist science paradigm, social, emotional, and reflective forms of thinking related to the strategy process should be understood, criticized, and transformed (Gretzel et al. 2020). By developing a value-based socio-cognitive theory of strategizing within the e-tourism field, the typical authoritative figure standing behind strategy building can undergo a learning process and realize that people have agency, value-based motives, and dignity (Allen 2016; Weaver 2021). As actor Charlie Chaplin said, "You need power only when you want to do something harmful – otherwise love is enough to get everything done"; a society which overcomes authoritative principles would stop primitive accumulation (Von Werlhof 2013; Smith 2014). By fostering social relationships, the person behind the managers, technology developers, and final users can empathize with others and transcend the functionalist and transactional assumptions of modern science brought to modern life (Göttner-Abendroth 2013, 2017).

In the same way, future studies on the ICT Productivity Paradox in tourism should aim to replace the concept of "human resources." First, literature has shown that downsizing the pool of employees by replacing humans through less costly types of capital, such as automation and robots, does not yield the expected performance improvements (Kengatharan 2018). Rather, the significance

of social, organizational, and moral capital most strongly and positively affects firm performance in terms of sustainable outcome improvements (Bengtsson et al. 2018). Thus, in tourism and hospitality – where personal encounters are irreplaceable – the mitigation of an overshooting of efficiency on the cost of employees adds social meaning to the use of transformative ICTs. Second, network analysis in tourism has shown that network effects occur due to creative social interactions between collaborating actors (Fuchs and Baggio 2017). Interestingly, however, these positive effects disappear if the focus remains on efficiency. The social network falls apart as soon as network members realize they are being instrumentalized for competitive, i.e., socio-ethically inferior, purposes (Clement et al. 2018).

A final but equally important field of future research regards the phenomenon of ICT-driven customer value co-creation. As Sigala (2018) highlighted, the dynamic and continuous advancements of ICTs will increasingly demand new mindsets to understand the transformative role of ICTs for value co-creation and their impact on the performance and legitimacy of tourism firms and the entire tourism ecosystem. In the past, the focus has been on ICT-driven enhancements of *hedonic* tourism experiences, such as through high-touch technologies fostering one-to-one engagement and empowering the customer. However, future research must study how ICTs can enhance *eudemonic* experience with consideration for ethical values, transcendent motives, and inner transformation (Martínez-Cañas et al. 2016; Sheldon 2020) through human-centered design and ICTs that enhance mindfulness (Stankov et al. 2020; Stankov and Gretzel 2020). Ultimately, an ethical-value-driven co-creation paradigm strives for responsible travel behavior (Gössling 2021). This paradigm comprises customer-driven co-development of sustainable tourism offers through open innovation concepts and platforms fostering proactive (off- and online) engagement with local tourism stakeholders, other visitors, and non-tourism organizations (Giesler and Veresiu 2014). Such open strategy and innovation approaches involve a large number of responsible stakeholders using ICTs to share opinions and experiences during all travel stages and in real time (Tavakoli et al. 2017). For example, little is known about how technologies could be used to reinforce the self-propagation of travellers' wisdom gained from online feedback to interact with other travellers to transform their guest behavior toward responsible consumption patterns, like minimizing their ecological footprint, consuming locally produced food, and favoring tourism suppliers that treat their employees most fairly.

Indeed, the often overused buzzword "strategic corporate social responsibility (CSR)" (Porter and Kramer 2011) can become a truly ethical concept only if it goes beyond the win-win dogma of current management science to build a conversation with and exchange between companies, customers, and society at large (Ghoshal 2005; Reyes et al. 2017; Joullié 2020). Strategic decisions should no longer be made just from the perspective of management and shareholders' interests but should be embedded in a dialogue between all concerned stakeholders beyond the boundaries of market and profitability logics. Strategic CSR should be viewed and practiced for corporate existence and industry practice and as a contribution to society, as opposed to being seen as the next corporate catchword or a marketing tool. In other

words, strategy research has a responsibility in not only assisting major industry leaders and shareholders to form a plan to implement a better future but also finding a reason and purpose – the core motivation and value – to exist and act.

Our global economic market system has channeled humans' thoughts, desires, wishes, and needs into a single major goal with a high level of abstraction and emptiness: *more money* (Brodbeck 2011a,b, 198). While this formal goal is often translated through nebulous notions like "modernity," "progress," and the "future," this normalized but irrational desire for more is not driven by any laws of nature. Rather, the growth dogma is propagated as the abstract objective of a neoliberal economic system anchored in manifold ego processes (from individuals' careerism over companies' profit maximization to states and blocs' political and military conflicts). Consequently, humans confront each other competitively like strangers, engaging in disastrous behaviors (Brodbeck 2011b, 199). Strategy research in and beyond tourism has degenerated into a profit-technology that functionalizes humans' knowledge and creativity as input to improve very particular 'market' results. However, these results do not represent those of a democratic majority. Rather, by using illusory economic performance measures, market-based competition is biased in deciding the pecuniary ethical quality of strategic knowledge (ibid 2011b, 207). By doing so, both sciences and technologies stopped being "neutral" (Allen 2016). However, *benevolent* creativity allows humans to use their awareness for their own cognizance (*gnosis*) and mental self-shaping to realize that there is neither a metaphysical (e.g., neo-Darwinian) nor biological (e.g., "the selfish gene") reason condemning humans to a particular destiny (Brodbeck 2011b, 210; Fuchs et al. 2021). On the basis of this insight, strategy scholars, ICT developers, and final users like travellers and tourism entrepreneurs can change their motivation from being competitively aligned to a world which confuses growth with human flourishing toward an empathic and convivial mode of practicing the art of travelling and hospitality (Brodbeck 2011b, 205; Gretzel et al. 2020).

Cross-References

- ▸ Business Intelligence in Tourism
- ▸ Digital Ecosystems, Complexity, and Tourism Networks
- ▸ E-Business Models in Tourism
- ▸ Management and Leadership for Digital Transformation in Tourism
- ▸ Revenue Management and E-Tourism: The Past, Present, and Future
- ▸ Service Management in the E-Tourism Era
- ▸ Sharing and Platform Economy in Tourism: An Ecosystem Review of Actors and Future Research Agenda
- ▸ Smart Tourists and Intelligent Behavior
- ▸ The Voice of Major E-Tourism Players: An Expedia Group Perspective
- ▸ Value Co-Creation in Dynamic Networks and E-Tourism

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