

PROJECT REPORT

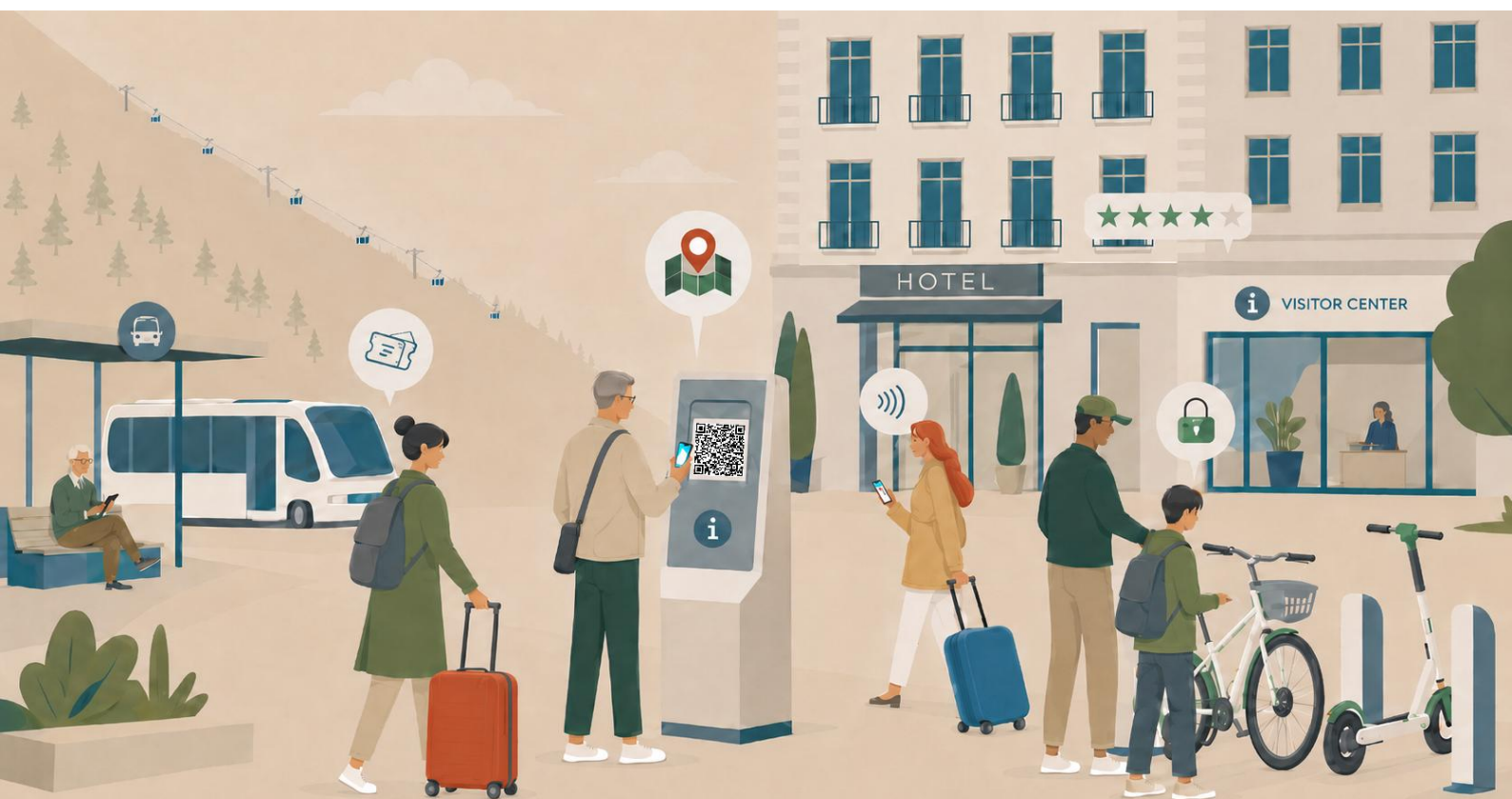
Digitally Supported Services and Business Models in Tourism

INNOSUISSE FLAGSHIP – RESILIENT TOURISM (RESto)

Subproject on the design of digitally supported services,
business processes and business models

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IMP-HSG, St. Gallen, 2026



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Note

In the **first part**, this report provides an overview of the existing body of academic knowledge regarding innovation in service design, business processes and business models in travel, tourism, and hospitality. It is based on an international *literature review* (2023) and thus rather theoretical. This provides the basis for subsequent empirical and conceptual work on the topic of this project. In the **second part**, this report includes an *empirical overview* (2024) of concepts such as business processes, business models, and business ecosystems, with a spotlight on the Swiss tourism sector. In the **third part**, the project report includes *conceptual work* (2025) on digitally supported services and business models in tourism and hospitality in Switzerland. It provides an overview of the project's outcomes and refers to further output of the different work packages (WP).

Part I	Chapters 2–5	Theoretical	Literature Review	WP1 (and WP2)	2022–2023
Part II	Chapters 6–9	Empirical	Practice Review	WP2 (and WP3)	2023–2024
Part III	Chapter 10	Conceptual	Project Review	WP3 and WP4	2024–2026

An overview of all publications resulting from this project can be found on *Alexandria* (repository): <https://alexandria.unisg.ch/entities/funding/cb55b11e-c4ab-42da-b52f-165848568ed0>

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<https://www.resilienttourism.ch/de/flagship-project>

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List of abbreviations

3D	Three Dimensional
5G	Fifth-Generation Technology for Cellular Networks
Abbr.	Abbreviation
AI	Artificial Intelligence
API	Application Programming Interface
AR	Augmented Reality
ATM	Automated Teller Machine
BI	Business Intelligence
B&B	Bed and Breakfast
CDM	Collaborative Decision Making
cf.	confer (compare)
CHF	Swiss Franc
CMS	Content Management System
COVID-19	Coronavirus Disease 2019
CRM	Customer Relationship Management
CRS	Computer Reservation System
DAM	Digital Asset Management
DMO	Destination Management Organization
DMS	Destination Management System
e	Electronic
e.g.	exempli gratia (for example)
et al.	et alii (and others)
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EHL	Hospitality Business School (Lausanne)
ERP	Enterprise Resource Planning
etc.	et cetera (and so on)
ETL	Extract, Transform, Load
EU	European Union

F&B	Food and Beverages
FHGR	University of Applied Sciences of the Grisons
FIFO	First-in-First-out
FIN	Financial
GDS	Global Distribution System
GIS	Geographic Information System
GOI	Gross Operating Income
GOP	Gross Operating Profit
GPS	Global Positioning System
h	hour
HES-SO (VS)	University of Applied Sciences and Arts of Western Switzerland (Valais)
HR	Human Resources
HRM	Human Resources Management
HSG	University of St. Gallen
HSLU	Lucerne University of Applied Sciences and Arts
ICT	Information and Communications Technology
IMP	Institute for Systemic Management and Public Governance
IOIS	Interorganizational Information System
IoT	Internet of Things
IT	Information Technology
JCI	Journal Citation Indicator
JIT	Just-In-Time
KPI	Key Performance Indicator
LLC	Limited Liability Company
LLM	Large Language Model
m ²	Square Meter
MDM	Master Data Management
MF-VAR	Mixes-Frequency Vector Autoregression

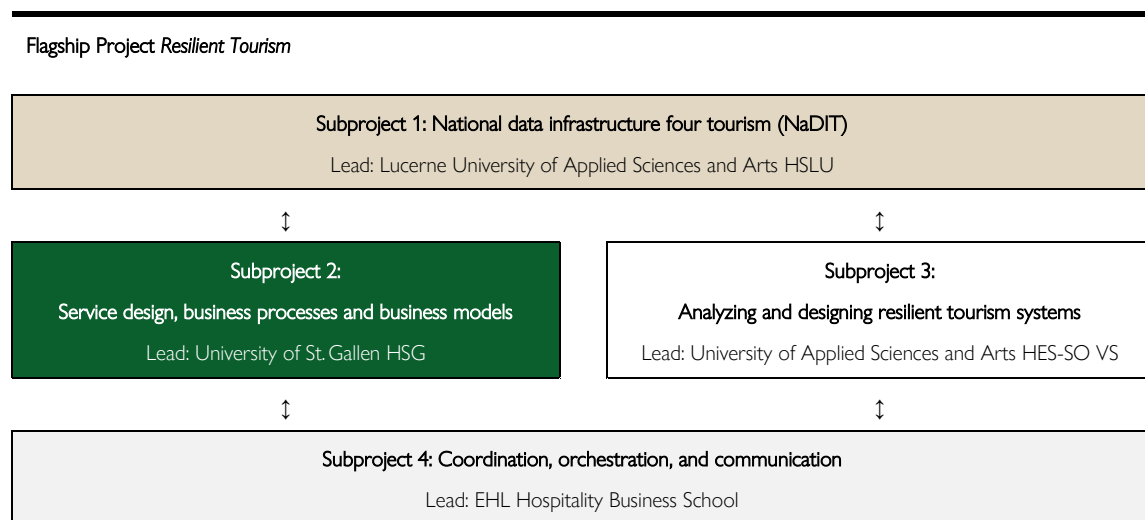
MIDAS	Mixed Data Sampling
ML	Machine Learning
MR	Mixed Reality
NaDIT	National Data Infrastructure for Tourism
NFC	Near-Field Communication
No.	Number
OECD	Organisation for Economic Co-operation and Development
OTA	Online Travel Agency
ÖV	Öffentlicher Verkehr (Public Transport)
PDF	Portable Document Format
PIM	Product Information Management
PMS	Property Management System
POI	Point of Interest
POS	Point of Sale
PR	Public Relations
QR	Quick Response Code
RAISA	Robots, Artificial Intelligence, Service Automation
RDK	Regional Tourism Alliance
ResTo	Resilient Tourism (Innosuisse Flagship Project)
RevPAR	Revenue per Available Room
RFID	Radio Frequency Identification
SBB	Schweizerische Bundesbahnen (Swiss Federal Railways)
SBS	Seilbahnen Schweiz (Association of Swiss Ropeways)
SOB	Schweizerische Südostbahn (South-Eastern Railway)
sec.	Second
SEO	Search Engine Optimization
SJR	Scimago Journal Rank
SME	Small and Medium Enterprises

SP	Subproject
SQL	Structured Query Language
ST	Schweiz Tourismus
STD	Smart Tourism Destination
S&M	Sales and Marketing
TA	Travel Agency
T&H	Tourism and Hospitality
TMC	Travel Management Company
TMS	Travel Management System
TO	Travel Operator
TTH	Travel, Tourism, Hospitality
UGC	User-Generated Content
USA	United States of America
VR	Virtual Reality
vs.	versus
WBE	Web Booking Engine
WP	Work Package
XML	Extensible Markup Language

1 Introduction

This report is part of the Innosuisse flagship project *Resilient Tourism* (ResTo). The project aims at making the tourism sector more resilient in times of crises. The flagship does so by developing data infrastructures, business models, and tools for sustainable digital transformation, while ensuring cross-fertilization between theory and practice. The report at hand represents the second subproject on service design, business processes and business models, which is led by the University of St. Gallen (HSG).

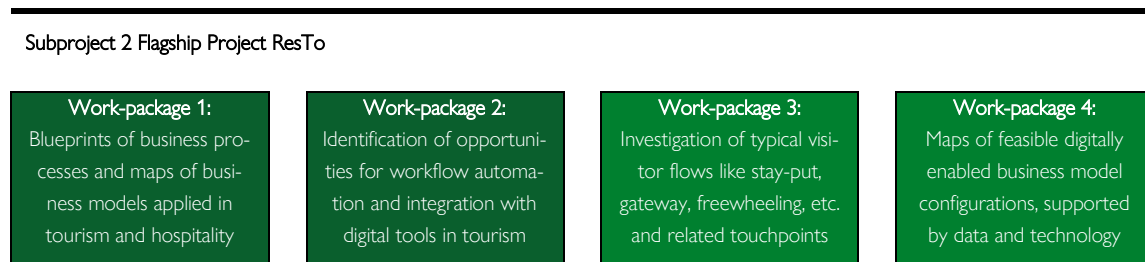
Figure 1: Structure of the Innosuisse Flagship Project Resilient Tourism (ResTo)



The *second subproject* of the flagship Resilient Tourism is based on the position that many services in travel and tourism are low in productivity and profitability. Moreover, created value is often insufficiently captured or lost to intermediaries. This subproject aims to identify possibilities and solutions to make businesses in tourism and hospitality more efficient and effective. It is expected that digital tools and integrations, both within and across companies, provide valuable benefits. The subproject is therefore closely related to the first subproject, which is working on a national data infrastructure for tourism (NaDIT). While the Lucerne University of Applied Sciences and Arts (HSLU) is leading the creation of a data infrastructure and possible use cases, the University of St. Gallen is working on data-based service designs and visitor processes.

To ensure practical relevance, the project builds on a large consortium of industry partners. These partners contribute and validate content in close collaboration with the academic leads. Before adopting a design-approach and developing service blueprints as well as business model maps, this report presents an overview of the existing literature in the field. It provides the academic and theoretical foundation for the subsequent, more practice-oriented work. After compiling academic literature on digitization in tourism and hospitality in *work-package 1*, the project aims at mapping the practical potential of digitization in *work-package 2*. This work then creates the basis for the subsequent modules. As part of *work-package 3*, the digital tracking of tourist visitor flows and touchpoints is investigated. Building on this, generic and specific business models with digital integration are designed in *work-package 4*.

Figure 2: Work packages of the second subproject of the flagship



The **first part** of this report is based on a comprehensive literature review from *work-package 1*. This academic review focuses on the topics of Smart Tourism and Tourism 4.0 in the sense of technology-based process innovations and data-driven productivity increases. The review provides a wide range of topical clusters surrounding hardware, software, solutions, services, features, capabilities, forms of collaboration, business concepts, economic effects, and issues in the field of technology-enabled tourism and hospitality. After this introduction, the first part of the report introduces the (2) *Literature review methodology*. It then presents the (3) *Literature analysis* based on the coded sources by providing an overview of both the authors in the field and the main clusters of keywords and key topics. Afterwards, relevant (4) *Literature excerpts* such as maps and frameworks are presented and structured along a system and a process perspective. The first part then ends with the (5) *Literature review conclusion*.

The **second part** of this report is adding to the first with a contrary approach from *work-package 2*. It focuses on actual business models and business processes in practice, that are enabled by digitization. This empirical collection of tools and cases can be seen as a complementary methodology to the theory-based literature review of the first work-package. Other than theoretically conceptualizing potential use cases based on technology-induced trends and data-based opportunities, this approach emphasizes practical implementations. The collection of cases is based on explorative work and partner input from academia and practice. It includes a broad range of digitally supported business processes and business models in the tourism and hospitality domain. After introducing the (6) *Practice review methodology* and some essential concepts, this report presents a (7) *Practice collection* of tools and applications. Furthermore, it includes specific (8) *Practice excerpts* and ends with the (9) *Practice review conclusion*.

The **third part** of this report builds on parts one and two while relating to *work-packages 3 and 4* of this project. It provides ground for design-based approaches to new business models and business processes, with an emphasis on Swiss tourism and hospitality. This conceptual part of the report presents novel ideas, which have been examined and tested during the project. As most of these modules have been developed in close collaboration with partners from academia and practice as part of the third and fourth work-package, this report only includes a (10) *Synthesis and outlook* regarding possible implementations. For a detailed view of the broad variety of ideas, ranging from the measurement of visitor patterns with the help of a tracking app to the integration of transportation in hotel packages and energy business models for alpine ropeway operators, a look at the respective documents is recommended. A detailed list of (implementable) outputs is available in the *Repository* (see Appendix; partly available in German only).

2 Literature review methodology

The brief methodological section of this report first explains the procedure (2.1) of the literature review. Secondly, it provides a short descriptive overview (2.2) of the resulting sample of sources (journal articles and books or book chapters).

2.1 Procedure

The following literature review is based on a keyword search with HSG Swisscovery meta search. This service covers not only all library collections from Swiss universities, but also most relevant online databases such as Scopus, Jstor, Web of Science, and many more. These are all licensed by the University of St.Gallen and therefore provide full-text access to most of the recent academic literature. Table 1 contains all searched keywords in the topical field of this subproject.

Table 1: Keyword search via Swisscovery meta search engine

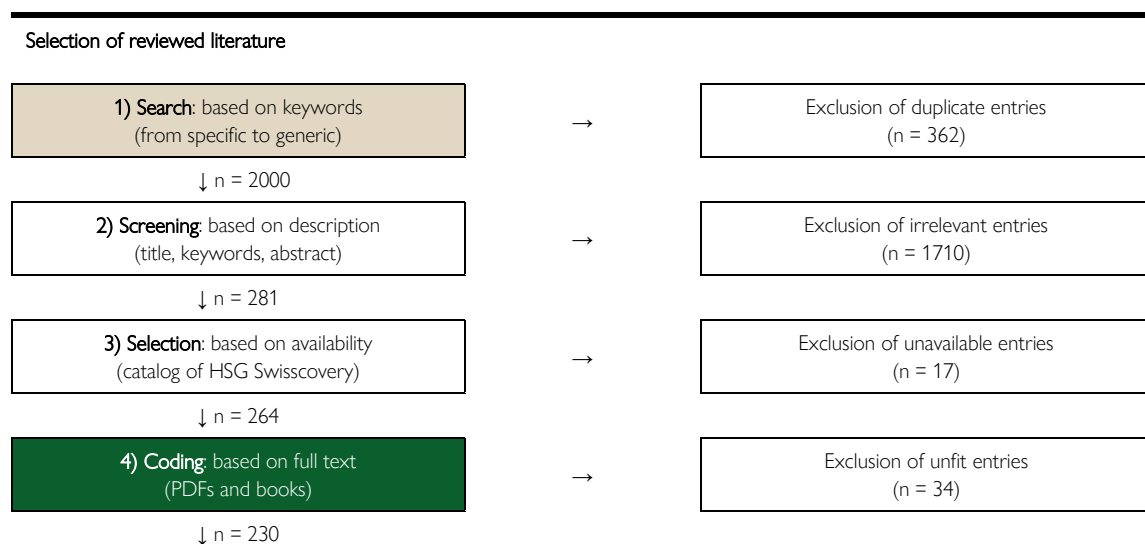
Keyword search, sorted by topic, from more specific to rather generic (no exact matching necessary)		No. of retrieved entries
1]	productivity AND hospitality OR hotel AND restaurant AND tourism	0 100 100 100
2]	process innovation OR design to cost AND hospitality OR hotel AND restaurant AND tourism	0 200 100 100
3]	data-driven AND tourism AND service design AND business process AND business model	100 100 100 100
4]	smart tourism AND service design AND business process AND business model	200 100 100 100
5]	tourism 4.0 AND process AND ecosystem AND value creation	100 100 100 100

The keyword search was performed in a hypothesis-driven manner, starting with more specific and ending with rather generic terms in the field. As introduced, low *productivity* [1] is expected to be at the origin of many issues in tourism and hospitality. Therefore, *process innovation* [2] and other design interventions might be necessary. In the age of digitization, *data-driven* [3] service designs and business models are becoming essential in tourism and transport, too. Making the industry more digital and sustainable is the core idea of *smart tourism* [4]. This conceptualization is related to the term of *tourism 4.0* [5], which is inspired by the highly digitized industry 4.0.

The keyword search with the meta service considers all relevant entries per source, including title, abstract and keyword descriptions. There is no exact matching necessary: the engine considers, e.g., both “process innovation” as well as “process” and “innovation”. Results in the Swisscovery meta search are presented by relevance – similar to a search engine like Google. The search results have been validated with Web of Science and Google Scholar queries. Due to the topicality of the project, the search included a broad array of sources, ranging from peer reviewed scientific articles to more practice-oriented handbooks.

The number of retrieved entries per query (Table 1) has been extended until the results have appeared too irrelevant, which was usually the case after 100 or 200 entries. After excluding duplicates (1), the identified literature (n = 2000) has been screened based on titles, keywords, and abstracts (2). This led to a reduced set of 281 sources, which have then been downloaded in full text, if available (3). The resulting list of sources (n = 264) has then been coded based on the full text (4). This led to the exclusion of 34 more entries and a final set of 230 sources (see Figure 3).

Figure 3: Selection procedure of the literature review



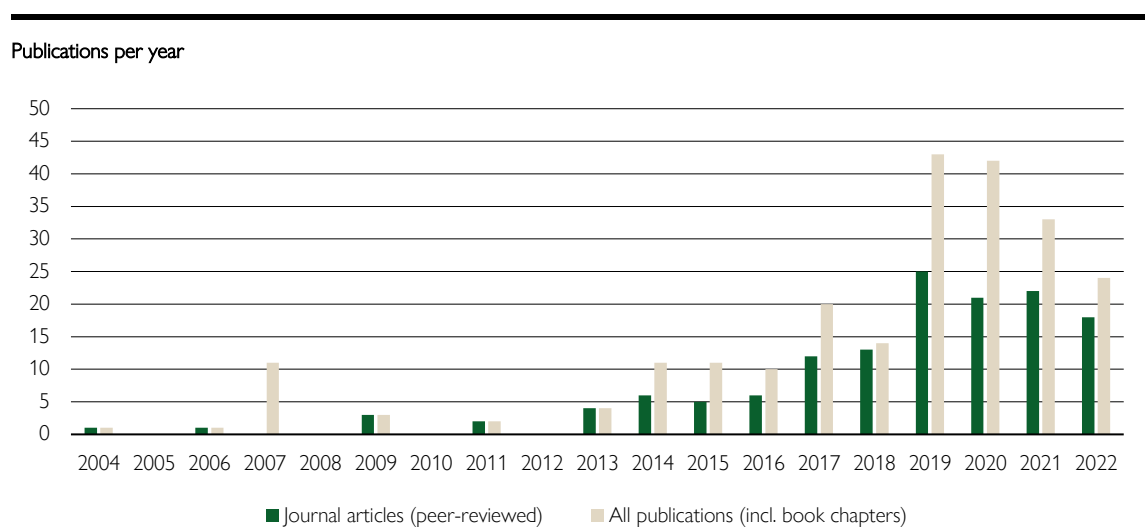
Entries have been classified as irrelevant when they were of pure promotional or rather educational content. Moreover, (very) low quality and (very) old age led to the exclusion of certain results. However, since this review is laying the groundwork for subsequent practice-oriented work, requirements regarding academic quality of writing have been weighted lower than inspirational potential for specific applications.

Regarding two main themes of this review (cf. Table 1), certain (dominant) streams of literature have been excluded from the coded results or identified as unfit for addressing the topic at hand: Much of the academic literature on *productivity* (in tourism and beyond) is focused on econometric analyses of factor productivity. While many of these studies confirm relatively low productivity rates in the tourism sector on a very abstract macro-level of analysis, they do not provide any practical insights into possible improvements of business processes. Furthermore, most literature on *process innovation* (in tourism and hospitality) is looking into managerial practices of innovation, without discussing actual innovation content such as redesigned business processes.

2.2 Sample

The descriptive analysis of the selected sample shows that most of the relevant literature was published in the last decade, with a peak in 2019. However, the final numbers for 2022 might be slightly higher, as the review was concluded during the fourth quarter of 2022. While most of the analyzed literature qualifies as peer-reviewed, there are several non-reviewed articles and book chapters, which have been included for their inspirational potential (cf. Figure 4).

Figure 4: Number of publications per year



During the last decade, several handbooks have been published in the wider field of this project. Relevant chapters from these books have been included as distinct entries in the literature review. This explains certain peaks of annual publication activity in the selection (e.g., for 2007). Table 2 contains all the books from which several chapters or articles have been included.

Table 2: Books with more than one selected chapter/article in the literature review

Books (Anthologies / Collections / Proceedings)	Year	Selected
The Emerald Handbook of ICT in Tourism and Hospitality	2020	14
Productivity in Tourism – Fundamentals and Concepts for Achieving Growth and Competitiveness	2007	10
Information and Communication Technologies in Tourism	2021	8
Big Data and Innovation in Tourism, Travel, and Hospitality	2019	6
Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality	2019	6
Analytics in Smart Tourism Design	2017	6
Smart Tourism as a Driver for Culture and Sustainability	2019	5
Information and Communication Technologies in Tourism	2015	5
Managing Consumer Services	2014	5
Exploring Service Science	2020	4
Open Tourism	2016	4
Technology Application in Tourism in Asia	2022	4

The selected peer-reviewed articles have been published in a wide range of academic journals. Table 3 contains all journals from which more than one article has been included in this analysis. To allow for qualitative classification, certain impact factors are provided. The *h-index* provides the number of articles (*h*) that have been cited at least *h* times each. The *SCImago Journal Rank (SJR)* weights citations depending on the importance of the source. The higher the factor, the more prestigious the journal is. The *Journal Citation Indicator (JCI)* by Clarivate provides a factor that includes several parameters such as document type and year of publication. The higher the factor, the higher the impact, with 1.0 representing the world average in a specific field.

Table 3: Journals with more than one selected article in the literature review

Journals	Selected	H-Index	SJR 2021	JCI 2021
International Journal of Contemporary Hospitality Management	20	100	2.29	1.93
Journal of Hospitality and Tourism Technology	9	34	1.21	0.95
Tourism Review	8	38	1.48	1.58
Sustainability	8	109	0.66	0.65
Current Issues in Tourism	4	82	1.84	1.76
Electronic Markets	4	41	1.03	1.23
Journal of Service Management	4	69	2.85	2.53
Journal of Destination Marketing & Management	3	50	1.75	1.84
The Service Industries Journal	3	70	1.80	1.83
Technological Forecasting and Social Change	3	134	2.34	2.40
Information & Management	3	170	2.56	2.50
Journal of Tourism Futures	3	21	0.81	1.14
Journal of Travel Research	3	145	3.29	2.37
Tourism Recreation Research	2	50	0.88	1.01
Tourism Management Perspectives	2	54	1.76	1.87
Tourism Management	2	216	3.38	3.02
International Journal of Hospitality Management	2	136	2.51	2.55
Tourism Planning & Development	2	36	0.84	0.83
Journal of Sustainable Tourism	2	114	2.48	1.78
Journal of Hospitality and Tourism Management	2	45	1.61	1.72
Information Technology & Tourism	2	23	1.04	1.30
International Journal of Tourism Cities	2	16	0.71	0.80

The most dominant publication in the review is the high-impact *International Journal of Contemporary Hospitality Management* by Emerald. Furthermore, important periodicals such as *Tourism Review* and the *Journal of Service Management* are comprised frequently. However, as explained, less prestigious but equally topical outlets such as the *Journal of Hospitality and Tourism Technology* and the *Journal of Tourism Futures* have been included several times, too. While the academic rigor and quality of writing might be lower in some of these papers, their practical relevance for this project can be equally high.

3 Literature analysis

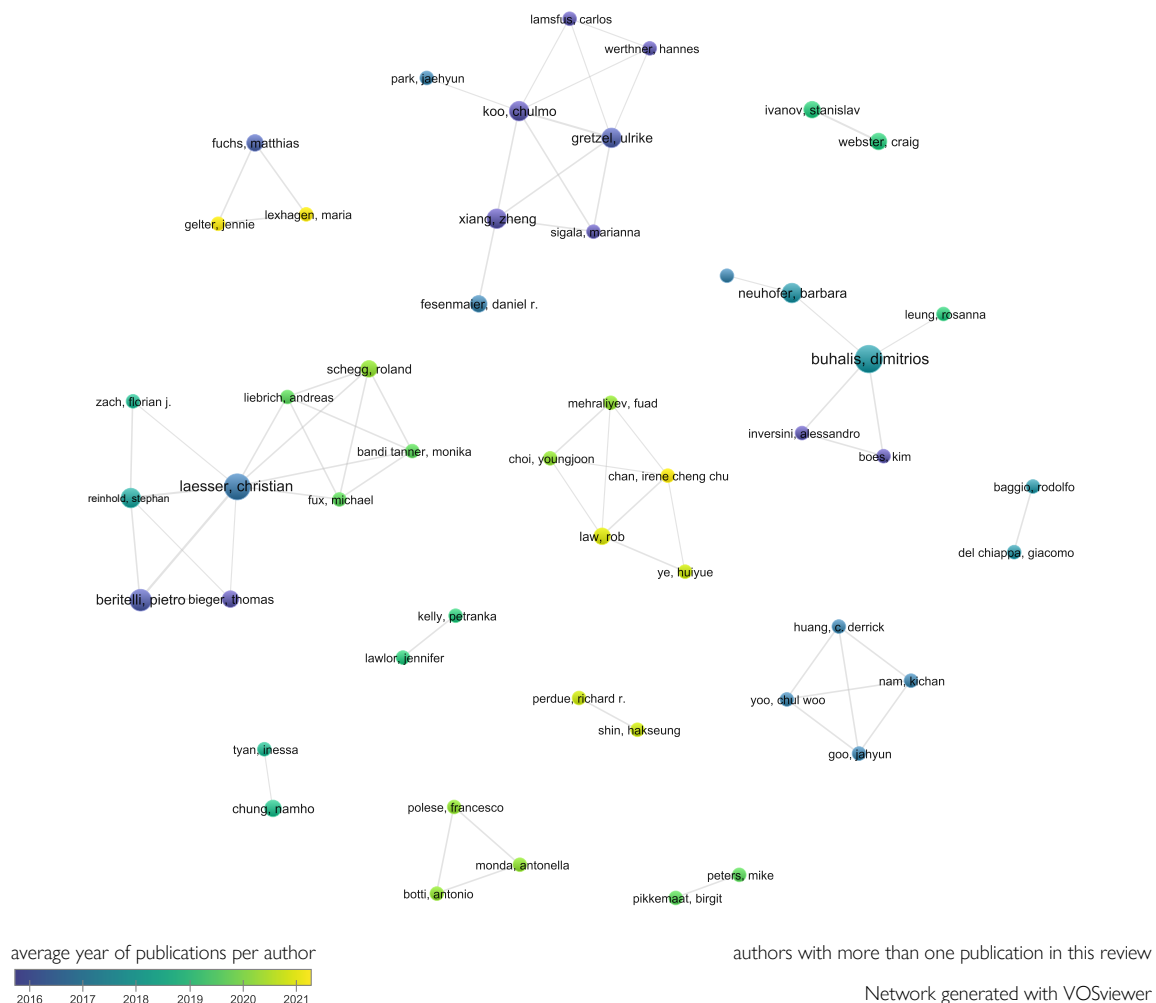
The bibliometric analysis is split into two main sections. First, it provides an overview of the relevant authors in the field (3.1). Secondly, the coded keywords are analyzed in detail. The coding of the 230 documents resulted in 1937 keywords out of which 180 appear more than twice (3.2). These are discussed in clusters (3.3) and aggregated in topics (3.4).

3.1 Authors

The 230 publications in the sample have been (co-)authored by 559 researchers. However, only 50 of these authors were involved in more than one of the included publications. This subsample of authors is included in a network analysis of co-authorships (Figure 5). The data is visualized with the help of the VOSviewer software. It exhibits several clusters of authorship but at the same time shows that there are many independent “communities” in the analyzed field.

Figure 5: Network of co-authorships

Co-authorship within selected literature

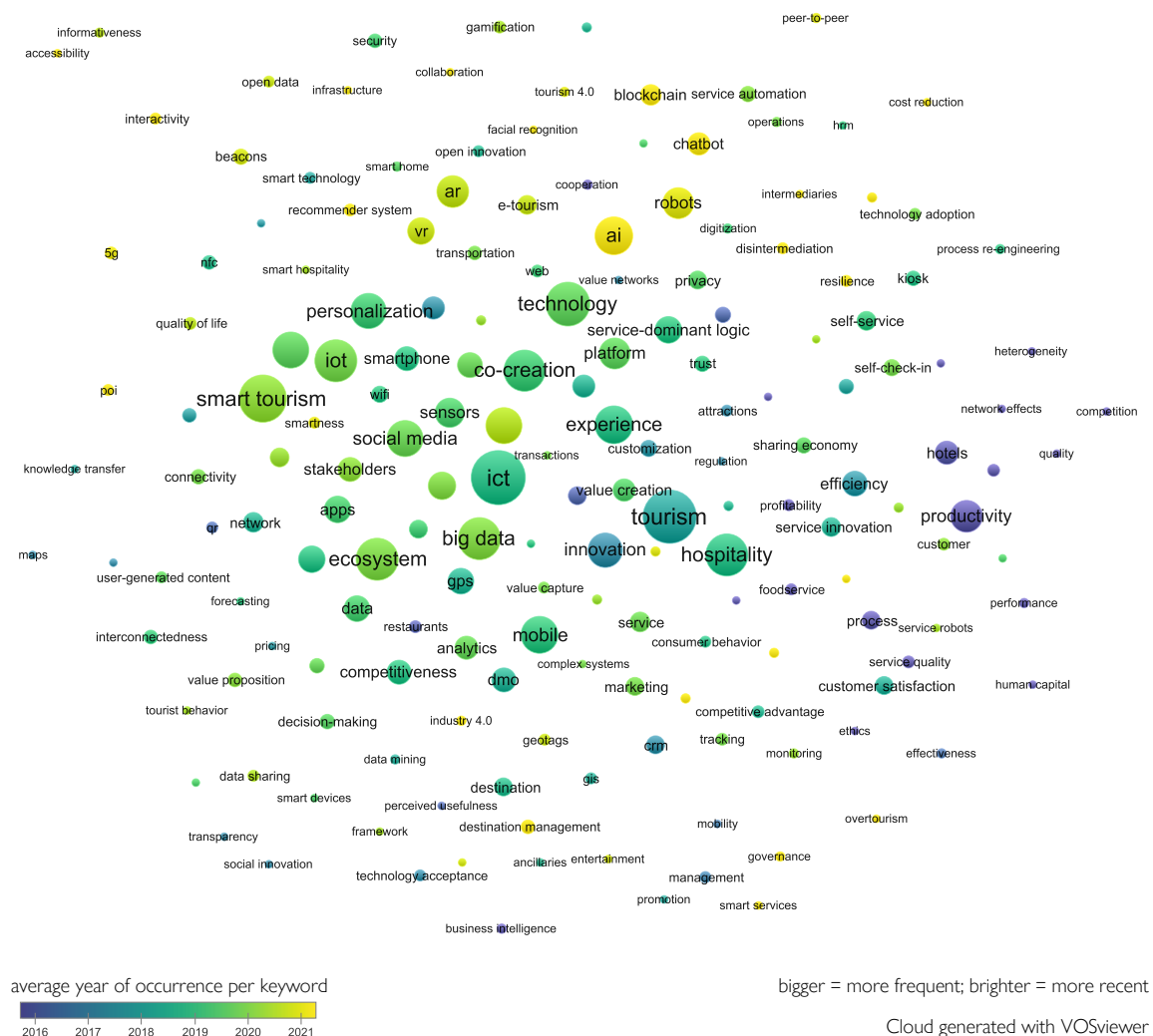


There are different explanations for the distinct clusters of authorship. First, there are some geographic groups (e.g., the “Swiss group” on the left, surrounding Laesser et al.). Secondly, due to the breadth of the analysis, there are various thematic subgroups (e.g., the “smart tourism group” of Buhalis et al.). Thirdly, there is also a dimension of time: Certain authors and themes have a longer history while others are more topical (see coloring in Figure 5, but also in Figure 6).

3.2 Keywords

All sources have been screened and coded based on keywords. The codes go beyond the typical five to seven keywords which are provided in the abstract section of most journal publications. Instead, the coding is aimed at covering key themes and reflecting the storyline of the paper or chapter. All 180 keywords with more than three appearances among the 230 publications are shown in the word cloud of Figure 6. Bigger circles represent more frequent terms while lighter circles reflect more recent concepts. The visualization is based on VOSviewer.

Figure 6: Cloud of 180 keywords from literature review



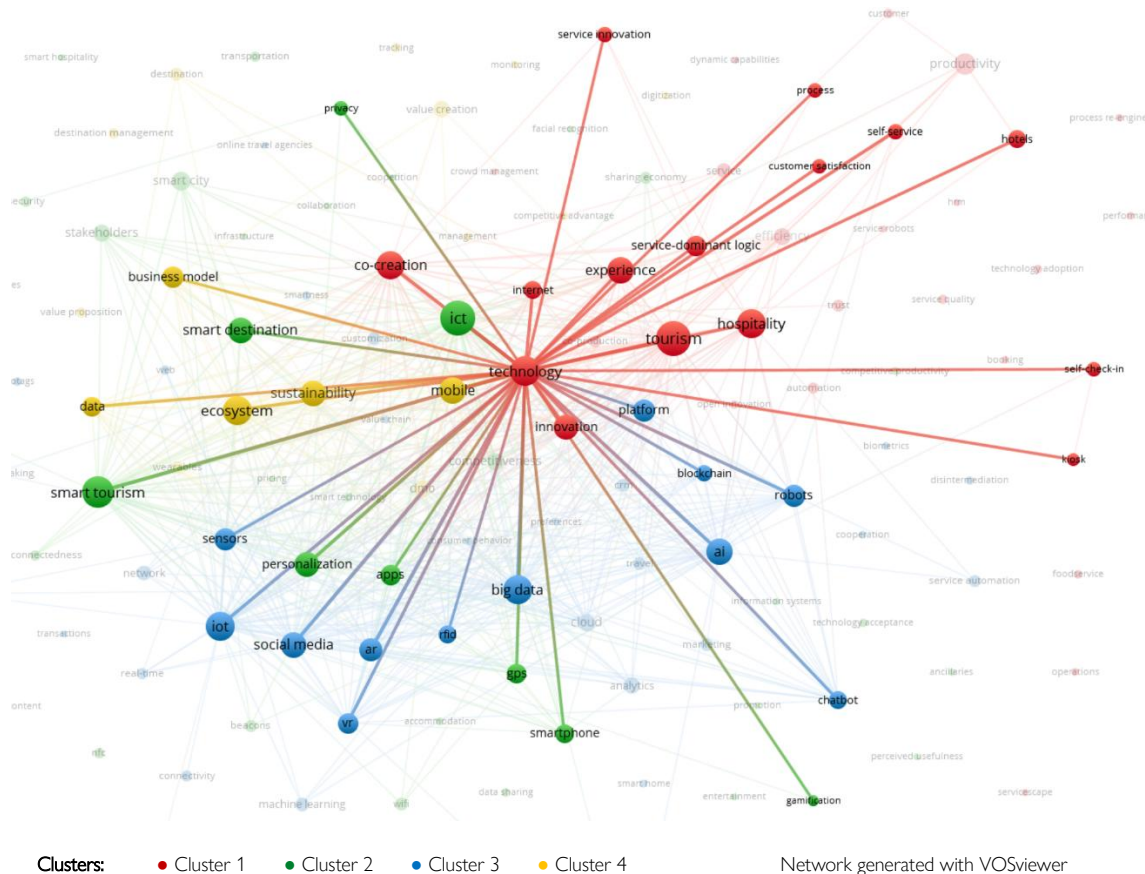
3.3 Clusters

After presenting a brief overview of the field of literature, the identified keywords are sorted into themes and discussed in more detail here. It is no surprise that keywords such as *tourism*, *hospitality*, as well as *smart tourism* are dominant as they were included in most of the search queries (see Table 1). The relatively even distribution of terms in the word cloud with rather similar distances between a lot of keywords indicates that there are no dominant and clearly distinguishable clusters. Nevertheless, a cluster analysis has been performed with the help of VOSviewer software to identify and discuss the 180 terms in groups of 40 to 50 terms (see following subsections).

Interestingly, at the core of the word cloud (Figure 6), there is the keyword *technology*, alongside *mobile*, and *ICT*. Furthermore, there are various specific technology-related terms such as *big data*, *AI*, or *IoT*, which are located further outside. The reason for the centrality of technology in the reviewed literature becomes obvious when zooming into the most related terms: Figure 7 highlights all keywords that appear at least five times alongside technology in the coded sources. It shows that technology is evenly co-occurring with various clusters (different colors). This again emphasizes the fact that there is a high interrelatedness across clusters. Thus, technology, despite belonging predominantly to the first cluster (red), is also closely related to themes in all the other clusters (green, blue, yellow).

Figure 7: Keywords with five or more co-occurrences with technology

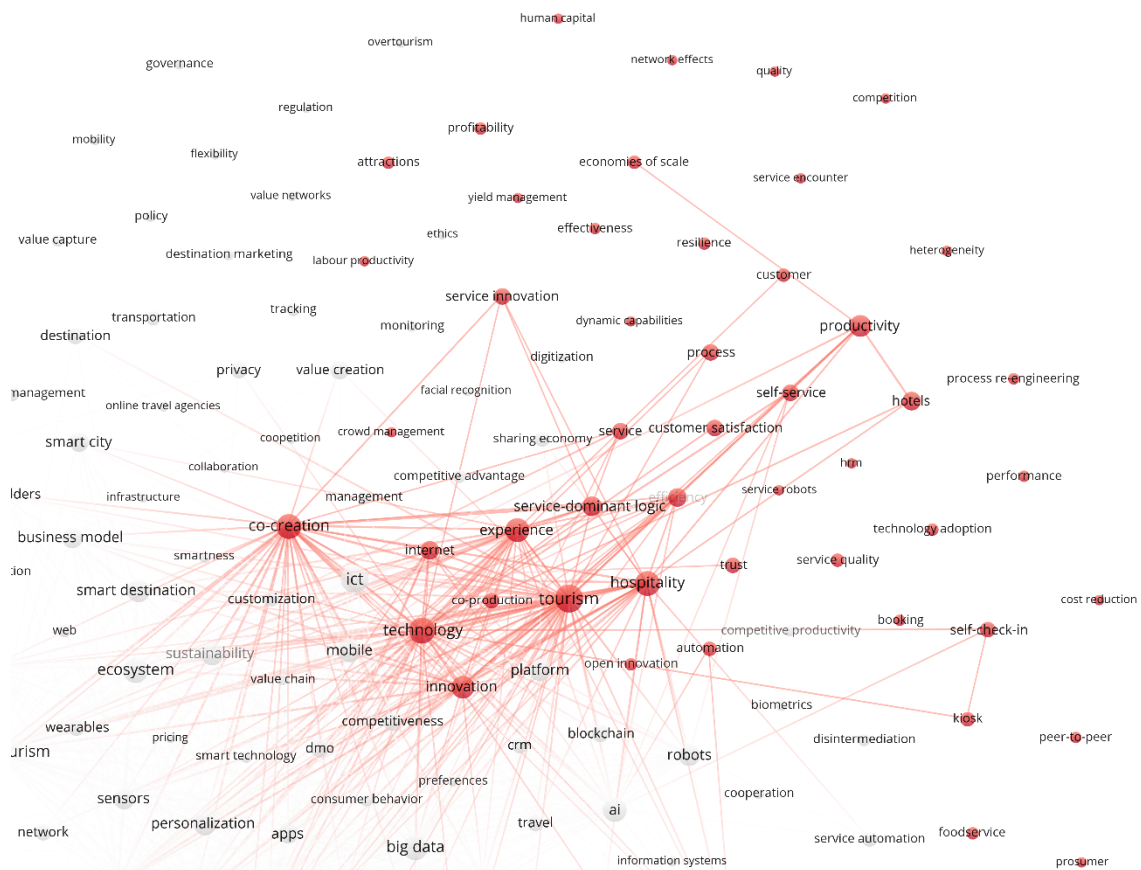
Exemplary keyword co-occurrence of technology which is strongly related to all clusters



3.3.1 Productively co-created experiences

The first cluster (red) evolves around rather generic themes of this literature review such as technology, tourism, and hospitality (see Figure 8). However, there are also some distinct keywords surrounding the issue of productivity and the redesign of services and experiences. The cluster is therefore named “Productively co-created experiences”. It contains **51 keywords**. Figure 8 visualizes their interrelatedness by highlighting combinations with five or more co-occurrences with red lines. In the subsequent paragraphs, the keywords of the cluster are discussed by relating them in a meaningful way.

Figure 8: Cluster 1 of keyword co-occurrences



Occurrences: from ● tourism (68) to ● network effects (3)

Co-occurrences: red line if ≥ 5

Cluster generated with VOSviewer

Both **tourism** and **hospitality** are phenomena that come into existence through **co-production** of tourists and providers of touristic **services**. From a theoretical perspective, a **service-dominant logic** prevails in this industry. Tourist **experiences** are **co-creations** of guests and various stakeholders and their environments, which include both man-made and natural **attractions**. According to this view, tourists are both consumers and producers, so-called **prosumers**. Interactions between **customers** and suppliers such as **hotels** or **foodservice** providers are often based on **trust**, which is formed and strengthened through **service encounters**.

Due to the **heterogeneity** of activities and the high level of interpersonal interactions, **labor productivity** in tourism is, on average, lower than in other sectors. However, appropriate (company-level) definitions of **productivity** are still contested in the tourism domain. Due to the above-mentioned properties of services, productivity is a multi-dimensional construct which can be measured both on the supply-side (**performance**) and the demand-side (**customer satisfaction**). There are concerns that increased productivity on the supply-side means lower productivity – and thus lower **service quality** – on the customer side. It is therefore important to define terms carefully and not confuse productivity with utilization and **profitability** of assets.

Nevertheless, due to fierce international **competition** in travel and tourism, there is a constant need for **cost reduction** – without compromising on **quality**. Service providers must therefore develop **dynamic capabilities** to increase both **efficiency** (doing the things right) and **effectiveness** (doing the right things) at the same time. It is crucial to achieve **resilience** by both optimizing **operations** and increasing **innovation**. The required **service innovation** could be achieved through older (e.g., **process re-engineering**) and newer approaches (e.g., **open innovation**). Like in most industries, **technology** can be expected to serve as an enabler. However, **technology adoption** is lagging in some areas of the tourism sector.

Thanks to **network effects** and **economies of scale**, the **internet** led to fast and widespread adoption of online **booking**, including **peer-to-peer** accommodation and services. Based on price elasticities and refined algorithms, such platforms allow for optimized allocation of resources and capacities through **yield management**, which also facilitates **crowd management**. However, many elements of the **servicescape** in tourism have not been transformed yet. While **self-check-in** with **self-service kiosks** is becoming the norm in the airline industry, this is not yet the case in hotels and restaurants. Nevertheless, since human resources management (**HRM**) is struggling to find and retain the required **human capital**, the reconfiguration and **automation** of certain **processes** (e.g., with **service robots**), might become accepted in hotels and restaurants, too.

3.3.2 Smartly personalized applications

The second cluster (green) evolves around the concept of smartness, which finds widespread use these days (see Figure 9): There are smart devices, services, people, and cities today. This smartness usually involves a rather ICT-centric view of intelligence that is expected to facilitate more personal solutions. The cluster is therefore named “Smartly personalized applications”. It contains **48 keywords**, which are related in a meaningful way in the subsequent paragraphs. Frequent keyword co-occurrences of five or more are indicated with green lines in Figure 9.

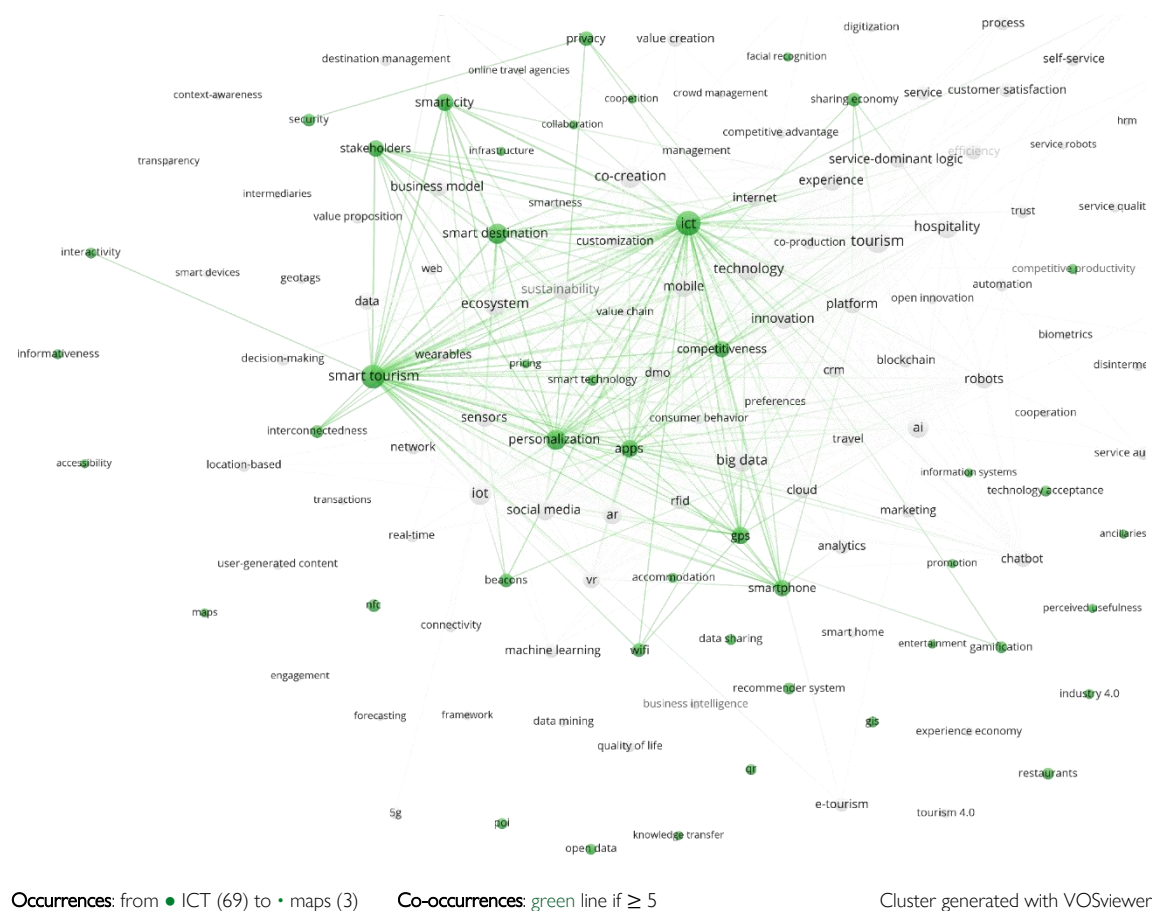
Information and communications technology (**ICT**) facilitates the development of solutions with a high degree of **personalization**. The **interconnectedness** of people and things through mobile networks such as **wifi** opens vast opportunities for the deployment of **apps** and other **smart technologies**. However, the concept of **smart tourism** is not limited to **smartphone** applications for tourists but goes far beyond the micro level. On the meso level, in line with the idea of **industry 4.0**, there is the notion of **smart hospitality**, which is based on digitized customer processes. On the macro level, similar to the concept of the **smart city**, there is the idea of **smart destinations**. Based on an extensive digital **infrastructure**, thanks to **open data** and **data sharing**, these destinations facilitate the **competitiveness** of various tourism **stakeholders**.

The **competitive productivity** is not based on fierce competition, but on **collaboration** and **coopetition** of various players – including participants in the **sharing economy**. Mapping **tourist behavior** on a destination level allows for **information systems** as well as personalized **recommender systems** that integrate **transport**, **accommodation**, **restaurants**, and **ancillaries**. This opens new opportunities for bundling and **pricing** of products and services on a destination-level.

Thanks to mobile devices with built-in **GPS**, location-based services can be provided easily. Based on geographic information system (**GIS**) with up-to-date content, tourists can locate themselves on **maps** and find nearby points of interest (**POI**) including status info. Furthermore, thanks to **NFC** sensors that read **beacons** as well as high-quality cameras that read **QR** codes, relevant information can be provided or collected conveniently. Live info on **accessibility**, but also **promotion**, **entertainment**, or location-based **gamification** is possible.

However, all these opportunities for digital **interactivity** depend on **technology acceptance** – of both tourists and providers of products and services. For potential users, **informativeness** and **perceived usefulness** are key. However, features like the monitoring of movements for personalization or **facial recognition** for convenient identification can also cause **privacy** concerns. Therefore, **security** of applications and data must be a priority.

Figure 9: Cluster 2 of keyword co-occurrences

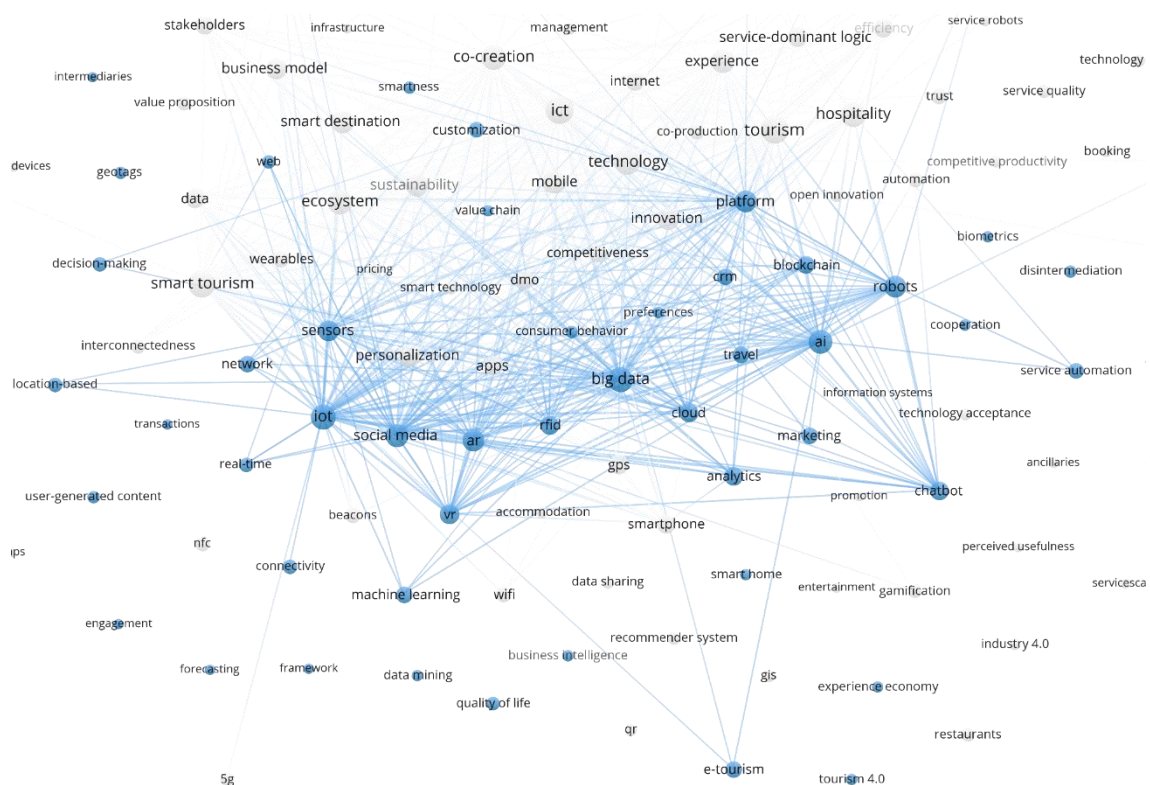


3.3.3 Networked platform solutions

The third cluster (blue) is closely related to the second one but emphasizing the role of technology platforms and networks (see Figure 10). It evolves around various network-based solutions for more digital travel and tourism platforms. The cluster is therefore named “Networked platform solutions”. It contains **48 keywords**, which are visualized with a blue dot in Figure 10 and discussed in the subsequent paragraphs. Keyword co-occurrences of five or more across publications are highlighted with blue lines.

Figure 10: Cluster 3 of keyword co-occurrences

Networked platform solutions



Occurrences: from ● big data (45) to ● intermediaries (3)

Co-occurrences: blue line if ≥ 5

Cluster generated with VOSviewer

As discussed before, **smartness** is a key characteristic of contemporary solutions for the **travel** sector. What started with simple **web** technologies, **e-tourism**, and **online travel agencies** is evolving into ever more data-based **cooperation** between various stakeholders in the era of **tourism 4.0**. So-called **big data** provides opportunities for **data mining** and **analytics** to improve **business intelligence** and **decision making**, e.g., thanks to improved **forecasting** models. Relevant data can be harvested from “internet of things” (**IoT**) and **sensor** networks, which can also include radio-frequency identification (**RFID**) and **geotags**. However, much of the available and relevant data in tourism and hospitality is based on **user-generated content** (**UGC**) from **social media**. Opinions and recommendations on review **platforms** can for example serve as indicators for customer **engagement** and satisfaction.

Data on **consumer behavior** and **preferences** (and possibly even **biometrics** for easy access and identification, e.g., with **smart home** applications in hotels) does not just improve **CRM** and facilitate personalized **marketing**. It opens opportunities for **service automation** and applications like **chatbots** (based on LLM). Based on ubiquitous **connectivity**, both **real-time** and **location-based** information can be provided in any language. Thanks to **AI** and **machine learning**, interactions with (both virtual and physical) **robots** appear increasingly natural. Augmented (AR) or fully virtual (VR) realities open new dimensions for tourism destinations in today's **experience economy**.

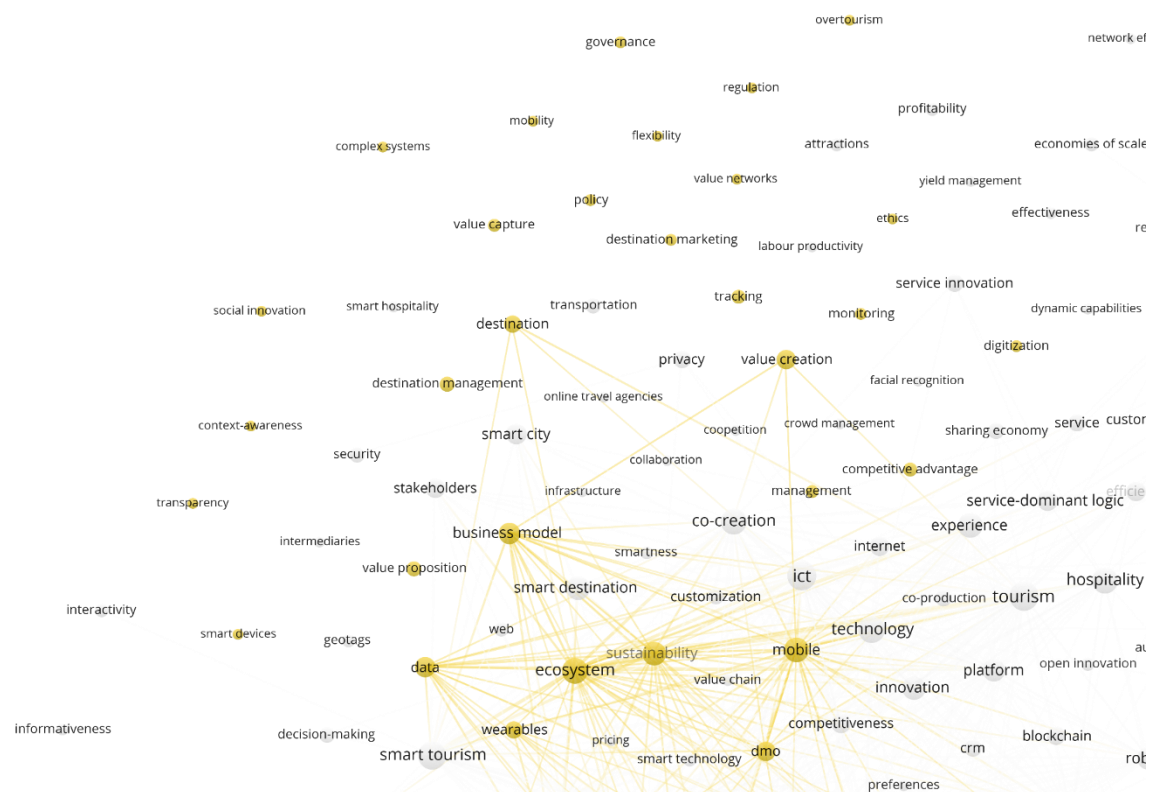
Networked **frameworks** allow for high degrees of **customization** along the entire **value chain** of tourism and transport. On one hand, (de-)centralized **cloud** platforms can provide interfaces for various **intermediaries**, thereby simplifying **interactions** and improving quality of life through services such as single sign-on for various services. On the other hand, distributed **blockchain** networks can lead to full disintermediation by providing transparency and traceability.

3.3.4 Data-based business ecosystems

The fourth cluster (yellow) evolves around the main topic of tourism business models and destination ecosystems (see Figure 11). As most of these concepts are highly data-driven, the cluster is called "Data-based business ecosystems". Figure 11 contains all **33 keywords** of this cluster, which are marked with a yellow dot. All keywords with five or more co-occurrences are connected by yellow lines.

Figure 11: Cluster 4 of keyword co-occurrences

Data-based destination ecosystems



Occurrences: from ● ecosystem (46) to ● regulation (3)

Co-occurrences: yellow line if ≥ 5

Cluster generated with VOSviewer

Ongoing datafication impacts **competitive advantage** across industries. Incumbent businesses are threatened by new **business models** that rely heavily on data. Novel **value propositions**, new ways of **value creation**, and innovative forms of **value capture** are required. Value is increasingly created across firm boundaries, spanning large **value networks** and business **ecosystems**. These **complex systems** can encompass entire **destinations** and require adequate **management** and **governance**. These requirements go beyond typical **destination management** and **destination marketing** of destination management organizations (DMO).

Today, visitors and all kinds of stakeholders are equipped with **mobile** devices and **wearables** that are connected via fast networks (5G). These **smart devices** provide opportunities for the request and provision of **smart services**. Thanks to **context-awareness** and **tracking** capabilities of these tools, detailed **monitoring** (of, e.g., the flow of people within destinations) is possible. This increased **transparency** allows for **social innovation** and improved **sustainability** across destinations. Issues such as increasing **mobility** and **overtourism** can be approached in systemic ways. **Digitization** increases **flexibility** of supply and demand but requires new **policies** and **regulations** to ensure business **ethics**.

3.4 Topics

After discussing the four (algorithm-based) clusters of co-occurrences, the keywords are presented in thematic lists, which have been sorted manually. In an iterative process, *ten topics* with **18 keywords** each have been identified. These sorted themes can serve as source of inspiration for conceptual work on process maps, service designs, business processes, and business models (which will be conducted in the next stage of this project; see, e.g., section 10.1).

As much of the (expected) innovation is based on technology, *hardware* (1) as well as appropriate *software* (2) to handle all the data is important. The combination of hard- and software allows for novel *solutions* (3) regarding *services* (4) in travel and tourism. These are usually based on certain *key features* (5) and help building new *capabilities* (6). Oftentimes, these abilities are based on new forms of *collaboration* (7) and interaction between stakeholders. Specific *concepts* (8) and phenomena are dominant in the reviewed literature on tourism and hospitality. These are closely related to certain *economics* (9) and *issues* (10) in the tourism industry and beyond.

Not all the 180 keywords are unambiguous. Some of them could be allocated to several topics. Crowd management can for example not just be seen as a capability of tourism organizations but also as a solution to certain problems (such as overtourism) or as a service (as part of a business model). However, in the following subsections, keywords have been sorted by primary association, and with the goal to create balanced lists of topics (see also Table 4 and Table 5).

3.4.1 Hardware

Innovation in travel and tourism is based on **technology** that is intelligent and connected. Based on various **networks** such as 5G, **wifi**, and **NFC**, various **sensors** and **smart devices** communicate over the internet (**IoT**). With the help of **mobile** technology such as **smartphones** and **wearables**, people and things can receive signals from **GPS**, **geotags**, **beacons** and **RFID**. Thanks to advances in **ICT** and extensive digital **infrastructure**, applications of **smart technology** are abundant.

3.4.2 Software

To fully utilize hardware, it is important to have software that can handle **data** efficiently. Based on powerful software, tiny cameras and sensors can read **QR** codes and **biometrics** today. Thanks to the **internet**, vast amounts of **social media** and **open data** are available like, e.g., **POI** and **GIS** data. Furthermore, a lot of data is stored on **cloud** servers or distributed **blockchains**. Thanks to **AI** and **machine learning**, **big data** provides opportunities for sophisticated **information systems** and **business intelligence** applications. Furthermore, new experiences such as **AR** and **VR** can be provided via **web**.

3.4.3 Solutions

The combination of soft- and hardware allows for **platform** solutions such as **smart home**, **smart hospitality**, and **smart tourism**. These **frameworks** do not just include **apps** with digital solutions for **HRM**, **CRM**, **maps**, and **kiosks**. Instead, they provide **automation** and **robots** in various areas of tourism and hospitality, thereby facilitating the provision of **smart services**. Solutions for **service automation** include **recommender systems**, **chatbots**, **yield management**, as well as physical **service robots** in hotels and restaurants.

3.4.4 Services

Novel solutions address all **service** elements in the tourism and **hospitality** value chain including **mobility**, **accommodation**, **foodservice**, **entertainment**, and more. They combine features from **online travel agencies** (OTA) with elements from **destination marketing** and **destination management** (DMO) to create seamless guest **experiences** with consistent **service quality**. This comprises services across the entire travel value chain and comprises **booking**, **transportation**, **hotels**, **restaurants**, **ancillaries**, and **attractions**.

3.4.5 Features

Several key features characterize the **smartness** of services. This includes **interconnectedness**, **accessibility**, **flexibility**, **interactivity**, and **personalization**. Thanks to **digitization** and **connectivity**, the provision of services is highly **customized** – and in some instances characterized by **disintermediation** and **gamification**. For certain **location-based** and **context-aware** services (like, e.g., easy access without ticketing), **tracking** and **facial recognition** might be necessary. However, to ensure the adoption of digitized services, aspects like **perceived usefulness**, **informativeness**, and **quality** must be high.

3.4.6 Capabilities

Digitization affects all processes ranging from general **management** to **operations** and **marketing**. It both requires and provides new capabilities regarding **monitoring**, **data mining**, **analytics**, **decision making**, **crowd management**, **pricing**, **promotion**, and **forecasting** to fully capitalize on digitization. As **service innovation** and **process re-engineering** is taking place across organizational boundaries, **data sharing**, **knowledge transfer**, and **open innovation** are key strategies. Pursuing both continuous improvements and radical innovation requires **dynamic capabilities** and organizational ambidexterity.

Table 4: Keywords in alphabetical order by topic (I)

Hardware	Software	Solutions	Services	Features
5g	ai	apps	accommodation	accessibility
beacons	ar	automation	ancillaries	connectivity
geotags	big data	chatbot	attractions	context-awareness
gps	biometrics	crm	booking	customization
ict	blockchain	framework	destination management	digitization
infrastructure	business intelligence	hrm	destination marketing	disintermediation
iot	cloud	kiosk	dmo	facial recognition
mobile	data	maps	entertainment	flexibility
network	gis	platform	experience	gamification
nfc	information systems	recommender system	foodservice	informativeness
rfd	internet	robots	hospitality	interactivity
sensors	machine learning	service automation	hotels	interconnectedness
smart devices	open data	service robots	mobility	location-based
smart technology	poi	smart home	online travel agencies	perceived usefulness
smartphone	qr	smart hospitality	restaurants	personalization
technology	social media	smart services	service	quality
wearables	vr	smart tourism	service quality	smartness
wifi	web	yield management	transportation	tracking

3.4.7 Collaboration

As customer **processes** are increasingly embedded in entire **ecosystems**, many **stakeholders** need to be involved to evolve and innovate. Services are characterized by **co-creation** and **co-production** which requires the **engagement** of **customers** who can often be described as **prosumers**. **Competition** is partially replaced by **collaboration** and **cooperation**, a status sometimes referred to as **coopetition**. At the same time, digitization enables **real-time** information and **peer-to-peer** exchange. This facilitates **sharing economy** approaches as well as the **self-service** applications. **Intermediaries** are sometimes replaced by tools such as automatic **self-check-in**.

3.4.8 Concepts

The literature review on current phenomena in **travel** and **tourism** provides a range of dominant concepts from theory and practice that are relevant for tourist **destinations**. There are industry-specific conceptualizations such as **e-tourism**, **tourism 4.0**, and **smart destinations**, which are inspired by the ideas of **industry 4.0** and **smart cities**. On a more general level, concepts such as the **business model**, the **servicescape**, the **service encounter**, and the **service-dominant logic** are discussed. In today's **experience economy**, **user-generated content** reflects **preferences** and **customer satisfaction** and can help understand **consumer behavior** or specific **tourist behavior**.

Table 5: Keywords in alphabetical order by topic (II)

Capabilities	Collaboration	Concepts	Economics	Issues
analytics	co-creation	business model	competitive advantage	complex systems
crowd management	collaboration	consumer behavior	competitive productivity	ethics
data mining	competition	customer satisfaction	competitiveness	governance
data sharing	cooperation	destination	cost reduction	heterogeneity
decision-making	coopetition	e-tourism	economies of scale	labor productivity
dynamic capabilities	co-production	experience economy	effectiveness	overtourism
forecasting	customer	industry 4.0	efficiency	policy
innovation	ecosystem	preferences	human capital	privacy
knowledge transfer	engagement	service encounter	network effects	quality of life
management	intermediaries	service-dominant logic	performance	regulation
marketing	peer-to-peer	servicescape	productivity	resilience
monitoring	process	smart city	profitability	security
open innovation	prosumer	smart destination	transactions	social innovation
operations	real-time	tourism	value capture	sustainability
pricing	self-check-in	tourism 4.0	value chain	technology acceptance
process re-engineering	self-service	tourist behavior	value creation	technology adoption
promotion	sharing economy	travel	value networks	transparency
service innovation	stakeholders	user-generated content	value proposition	trust

3.4.9 Economics

Due to intense competition in the sector, **competitiveness** is a key topic in tourism literature. **Competitive advantage** can be achieved through a series of economic measures such as **cost reduction** through increasing **economies of scale** and scope or **network effects**. **Competitive productivity** can be achieved through improved **effectiveness** and/or **efficiency** of **transactions** and deployed resources such as scarce **human capital**. For optimal **performance**, **productivity**, and **profitability**, all elements of a business model must be aligned, including **value proposition**, **value capture** and **value creation** (throughout entire **value chains** or **value networks**).

3.4.10 Issues

Many of the above-mentioned solutions and capabilities aim at improving or mitigating issues in the **complex system** of travel and tourism with digital solutions and **social innovation**. They aim at improving **quality of life** for tourists and locals, tackling **overtourism**, ensuring **sustainability** and **resilience** of the sector. The **heterogeneity** of the industry provides challenges for **policy**, **regulation**, and **governance**. Most of the conceivable approaches to solving issues such as lagging **labor productivity** require **technology acceptance** and **adoption**, which can be challenging. Key issues such as **ethics**, **privacy**, **security**, and **transparency** must be accounted for to create **trust**.

4 Literature excerpts

After providing an overview of the 180 most frequent keywords and sorting them into topics, some relevant excerpts from the 230 reviewed sources are presented in the following subchapters. These extracts are sorted into system-based and process-based views and approaches. The system perspective (4.1) includes rather high-level conceptual frameworks regarding smart tourism, ecosystems, and technology. The process perspective (4.2) includes excerpts on innovation and competitiveness while being more specific by providing excerpts of detailed business models, service blueprints, and customer processes. The chapter is concluded (4.3) by a selection of identified, readily available solutions regarding digitally supported service designs, customer processes and business models.

As mentioned earlier, this review includes both peer-reviewed articles as well as more practice-oriented publications. The consideration of grey literature is important as academic journals do not (yet) reflect the full discussion from industry and trade (Cao et al., 2022). Even though some of these non-reviewed publications are of moderate quality, they sometimes provide relevant content. Much of this is included in the following subsections in the form of aggregate frameworks and figures from the reviewed literature. Since most of the ideas are presented in their original, visual form, the excerpts are relatively heterogeneous in layout, size, and level of detail. Some of the figures contain abbreviations, which can all be found in the *List of abbreviations* of this report. Based on their sorting into various subsections, many of the excerpted figures are self-explanatory. Most of them are therefore left uncommented – except for the provided captions.

4.1 System view

The excerpts from the literature review that provide a system perspective on the topic are structured as follows. In the first subsection, various conceptualizations of smart tourism and smart destinations are presented (4.1.1). The second subsection provides an overview of the tourism ecosystem and various subsystems and networks (4.1.2). This is then complemented by a presentation of system-wide applications of technology (4.1.3) as well as important attributes and factors for their adoption (4.1.4).

4.1.1 Smart tourism destinations

The idea of smart tourism is a fuzzy concept but used in theory and practice (Gretzel, Sigala, et al., 2015, p. 180). In a political initiative to make tourism smart, the European Union decomposes the concept into aspects such as accessibility, sustainability, digitalization, cultural heritage, and creativity (Sotiriadis, 2022). Smart tourism is related to the (equally fuzzy) concept of tourism 4.0, which is mostly technology-oriented (like industry 4.0). However, smart tourism is not just about efficiency, but also about effectiveness, sustainability, and socio-environmental aspects of tourism (Pencarelli, 2019, p. 461). The following figures provide various systemic conceptualizations of smart tourism destinations, their development, as well as smart tourist experiences and concepts of the smart tourist (see Figure 12 to Figure 20).

Figure 12: Smart tourism model based on socio-technical system theory (Lim et al., 2017, p. 5)

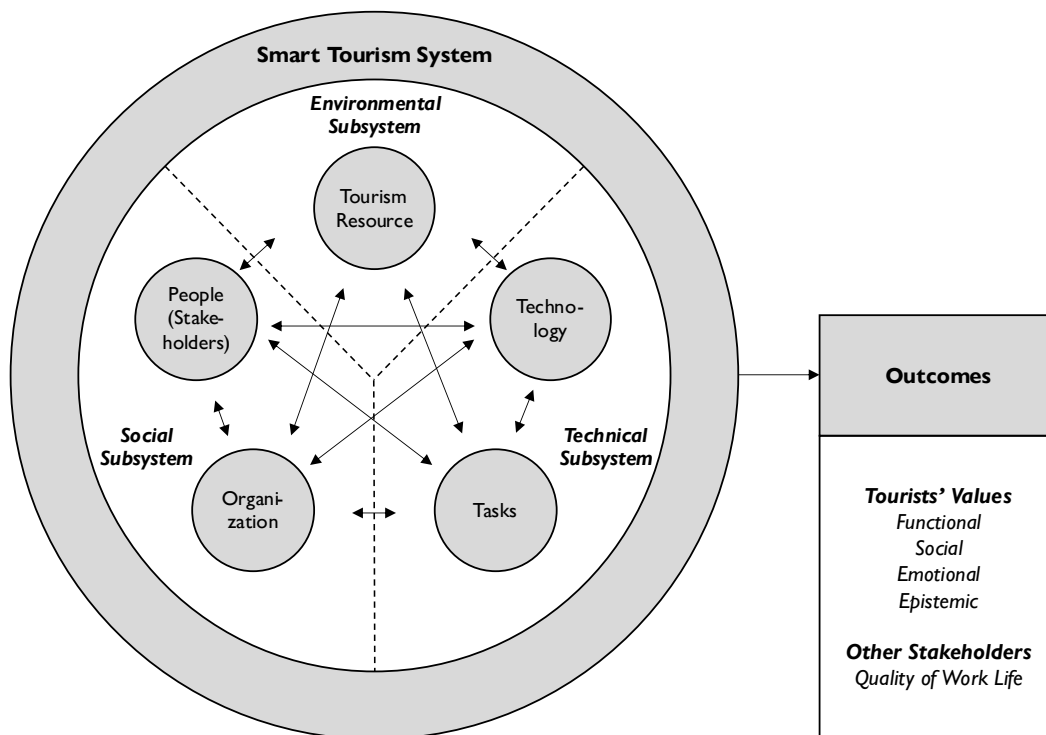


Figure 13: Resilient smart tourism destination (Coca-Stefaniak, 2019, p. 516)

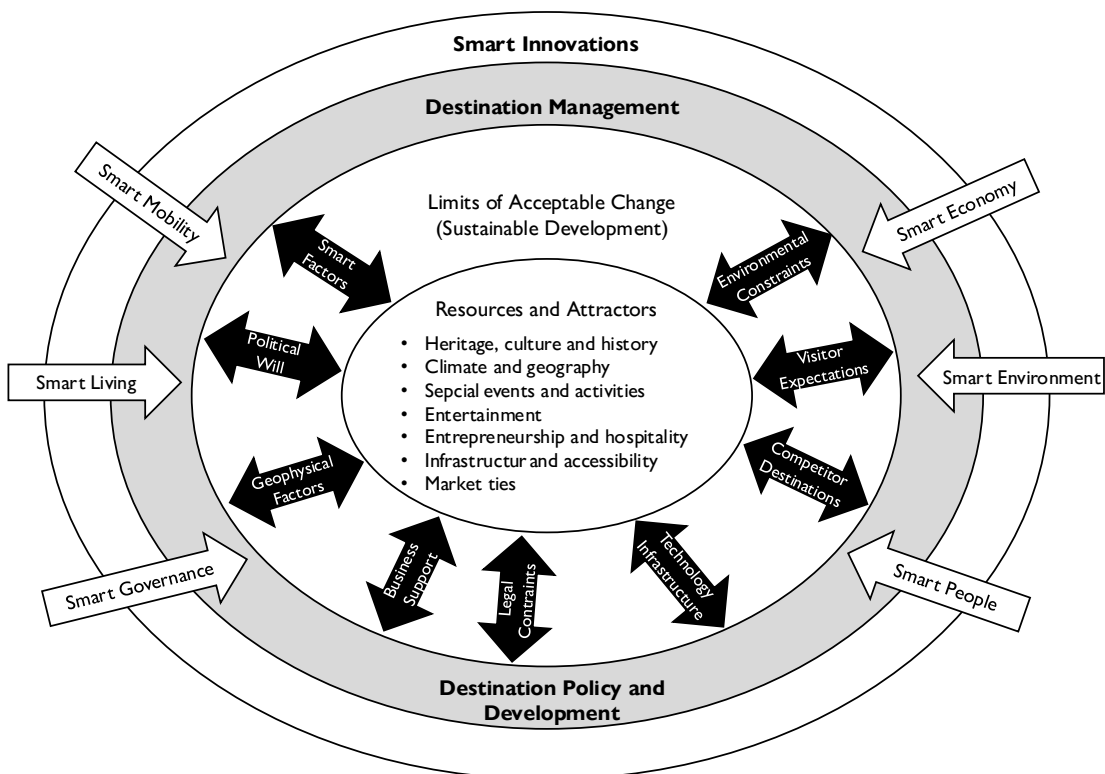


Figure 14: Model of sustainable smart tourism destinations (Shafiee et al., 2019, p. 297)

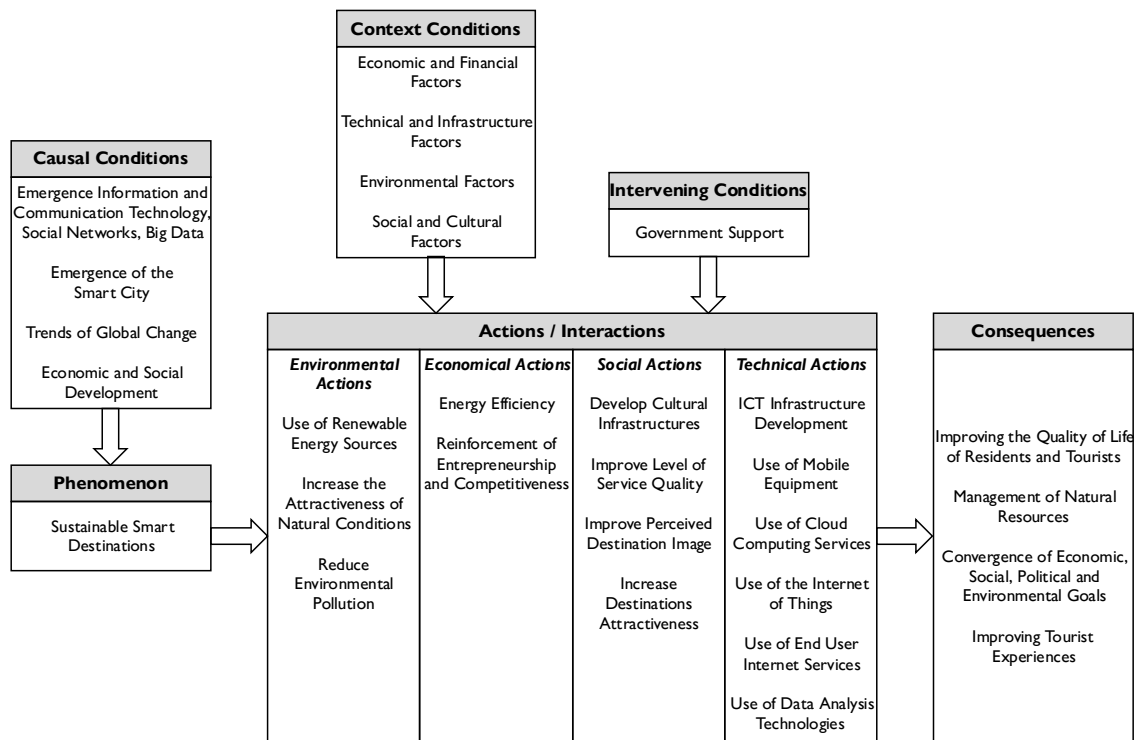


Figure 15: Model of smart tourism destination development (Cavalheiro et al., 2019, p. 251)

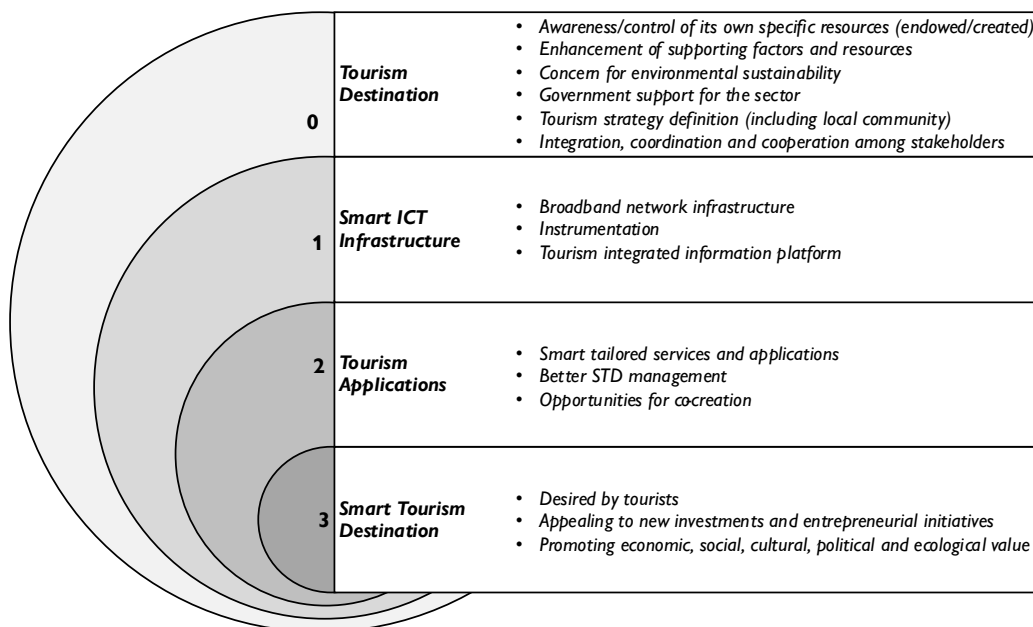


Figure 16: Smart tourism destination framework (Boes et al., 2016, p. 119)

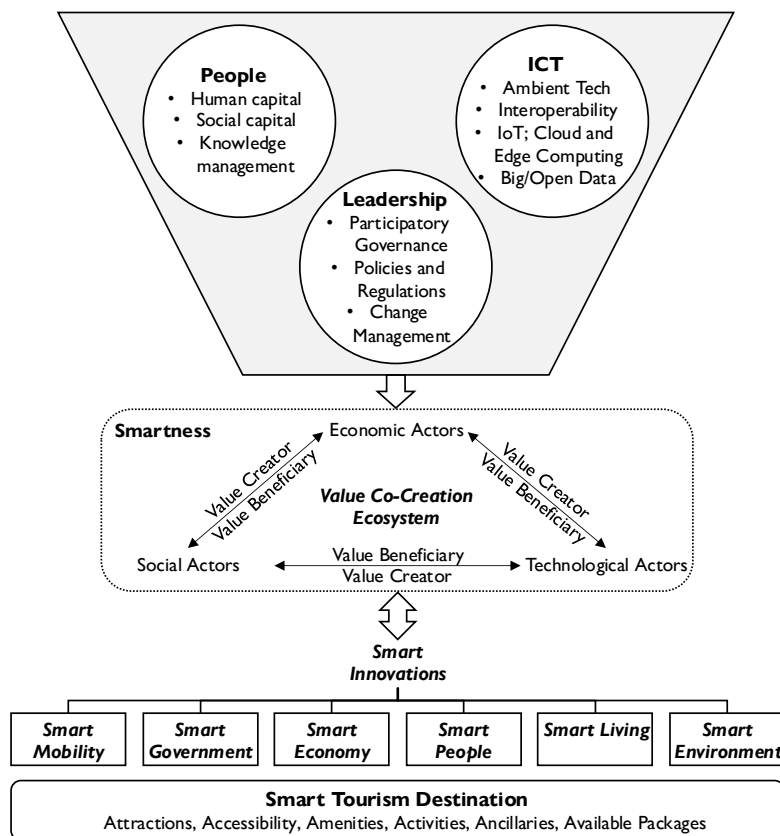


Figure 17: Smart tourism architecture (Koo et al., 2017, p. 684)

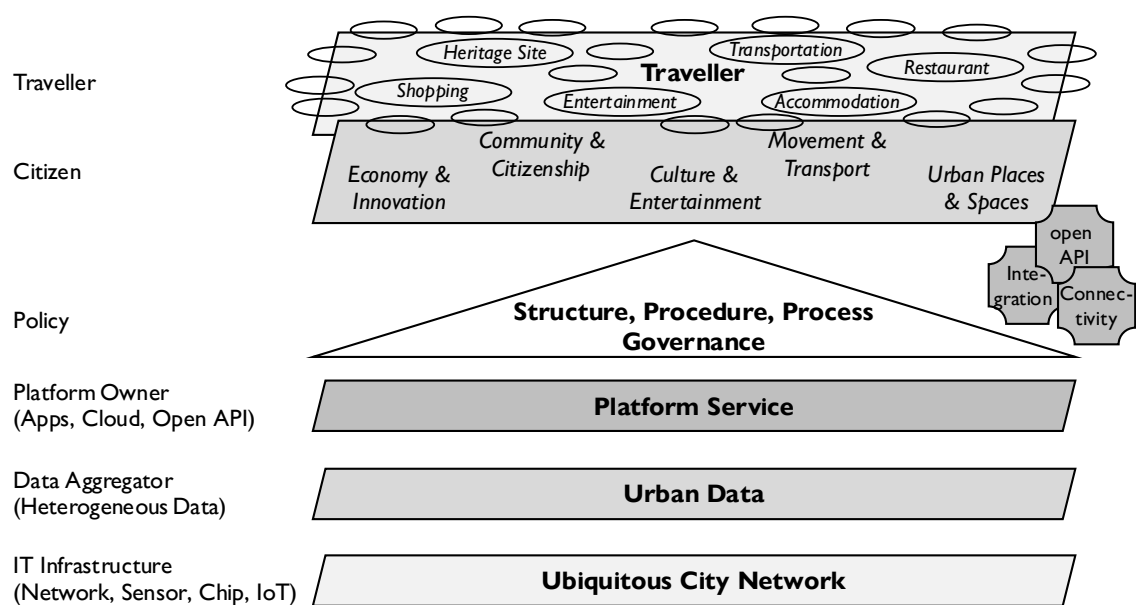


Figure 18: Smart tourist in smart destination framework (Femenia-Serra et al., 2018, p. 119)

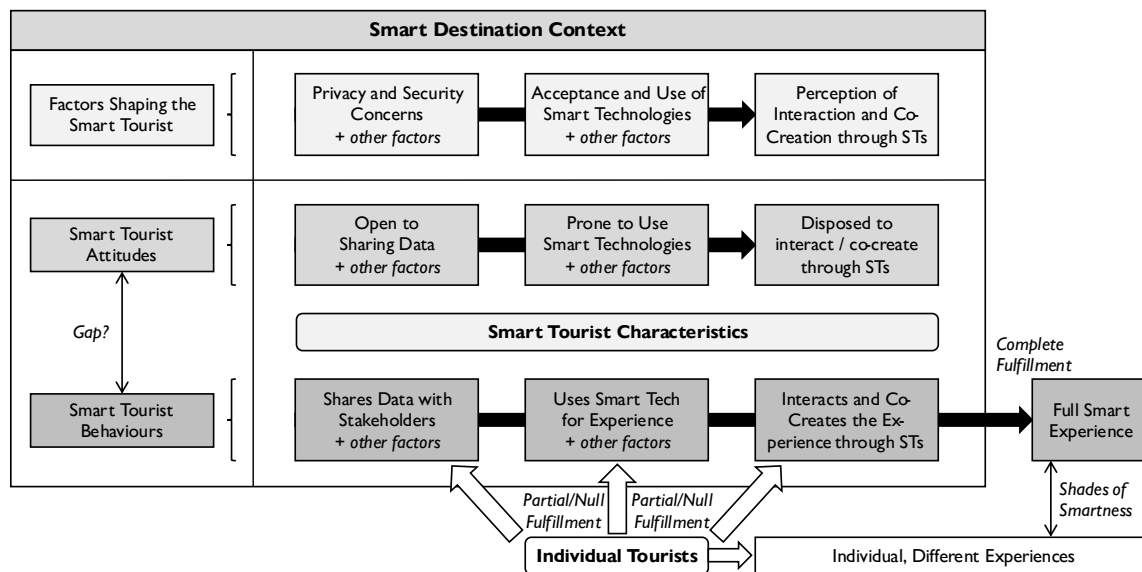


Figure 19: People-process-technology framework of smart tourism (Chen et al., 2021, p. 9)

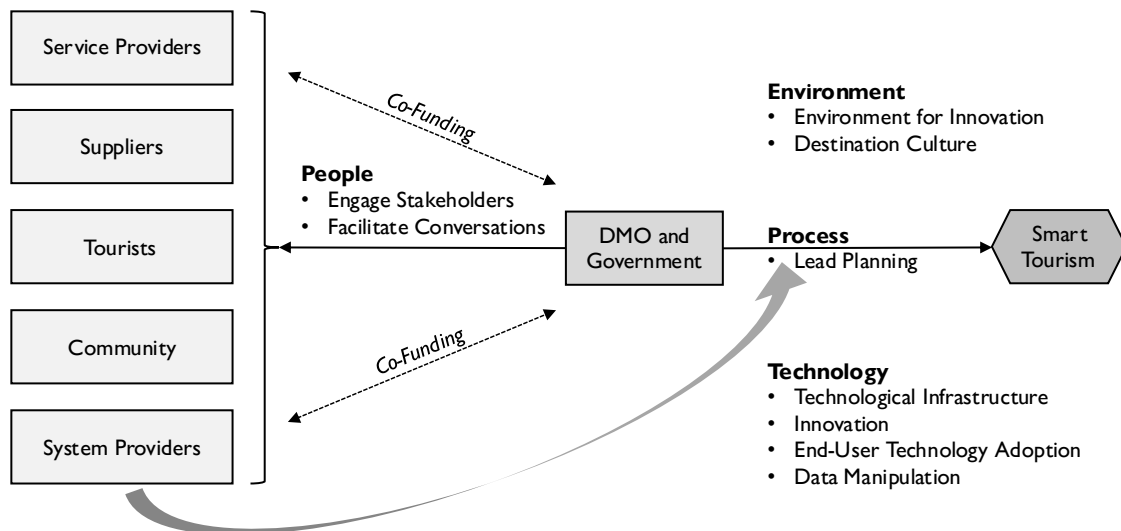


Figure 20: Smart tourism with IT-enabled capabilities (Arenas et al., 2019, p. 158)



4.1.2 Tourism ecosystems and networks

In some articles, smart destinations and smart tourism are conceptualized as ecosystems, which (again) constitutes a rather fuzzy term which has found widespread adoption across many fields. However, the tourism sector has some distinct characteristics which might indeed be best described by the idea of an ecosystem. In tourism destinations, a wide range of stakeholders interact in many ways to create a tourism experience. The subsequent collection of conceptual frameworks starts with high-level ecosystems (Figure 21) and ends with sector-specific systems such as hospitality, mobility, food and beverages, and cruises (Figure 30). In the following figure, Gretzel et al. (2015, p. 561) include touristic consumers (TC), resident consumers (RC), tourism suppliers (TS), and other industry suppliers (OS), along with destination management organizations (DMO), government, media, and various intermediaries to illustrate a smart tourism ecosystem.

Figure 21: Smart tourism ecosystem (Gretzel, Werthner, et al., 2015, p. 561) (TC/RC: Touristic/Resident Consumer; OS: Other Suppliers)

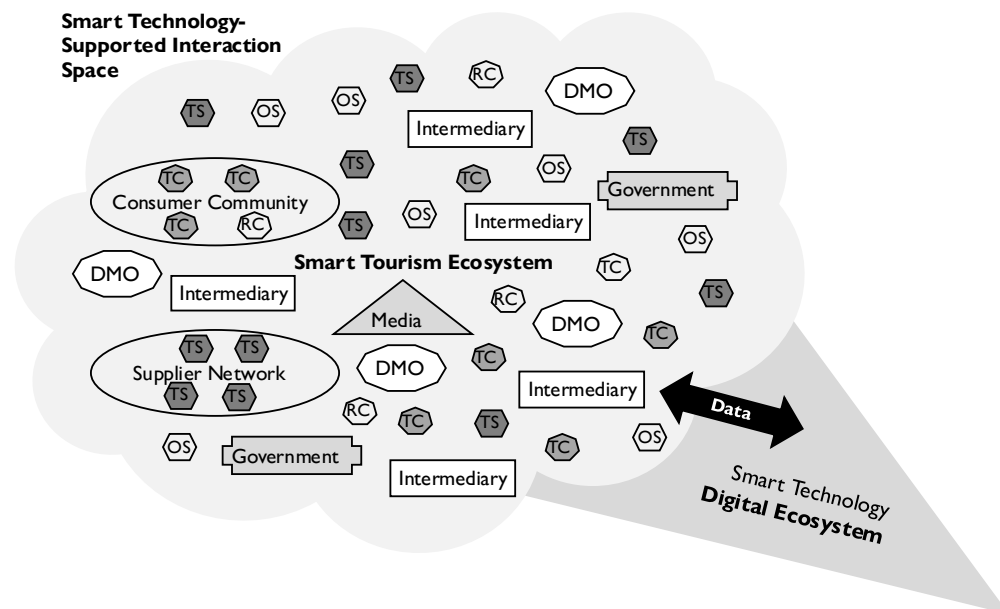


Figure 22: Smart industrial tourism business ecosystem (Concetta Perfetto, 2016, p. 255)

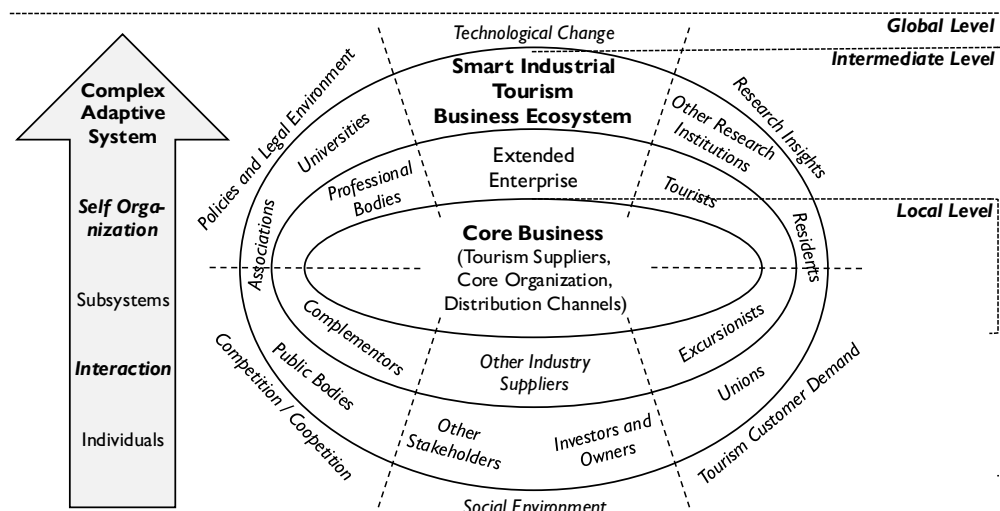


Figure 23: Smart service ecosystem in tourism (Polese et al., 2018, p. 12)

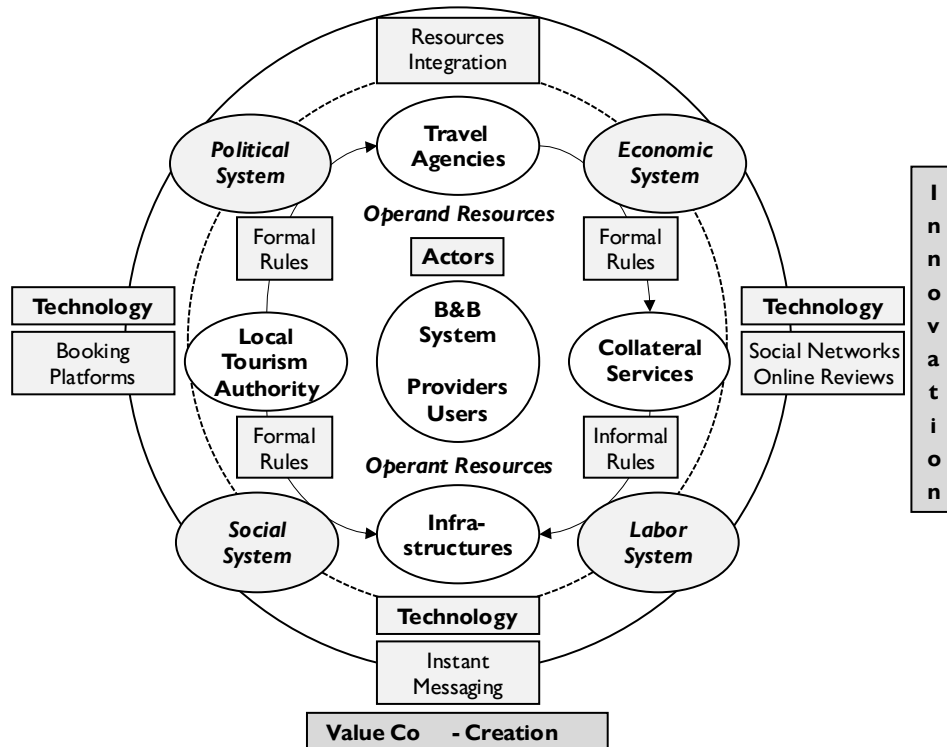


Figure 24: Smart tourism ecosystem; see source for full model (Sedarati et al., 2022, p. 304)

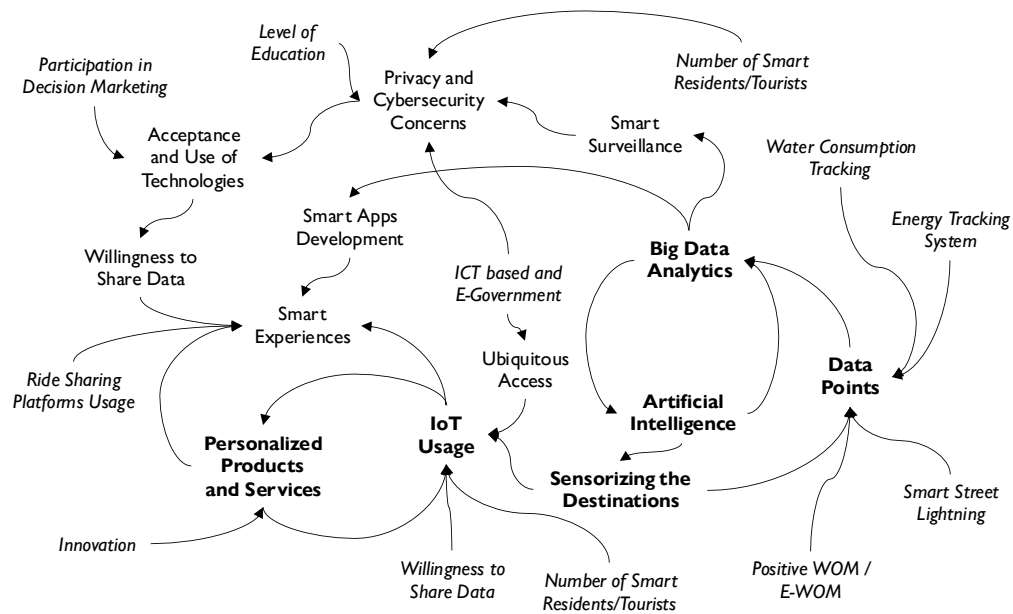


Figure 25: Generic value network of tourism as 'e3-value model' (Schaffer et al., 2021, p. 359)

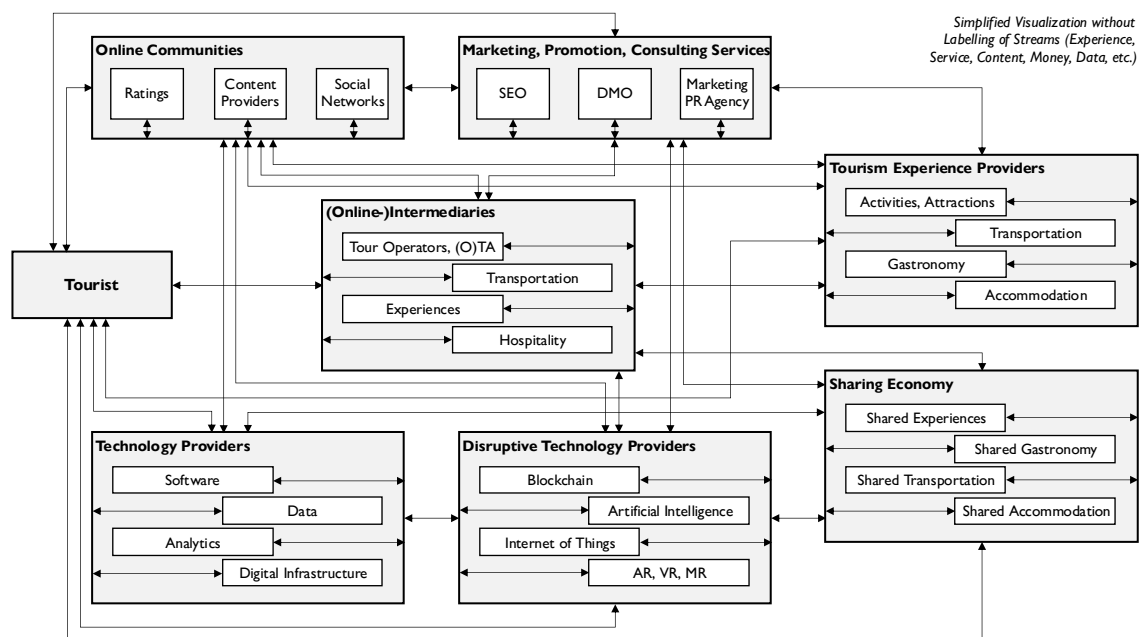


Figure 26: Key members in the hospitality ecosystem (Buhalis & Leung, 2018, p. 42)

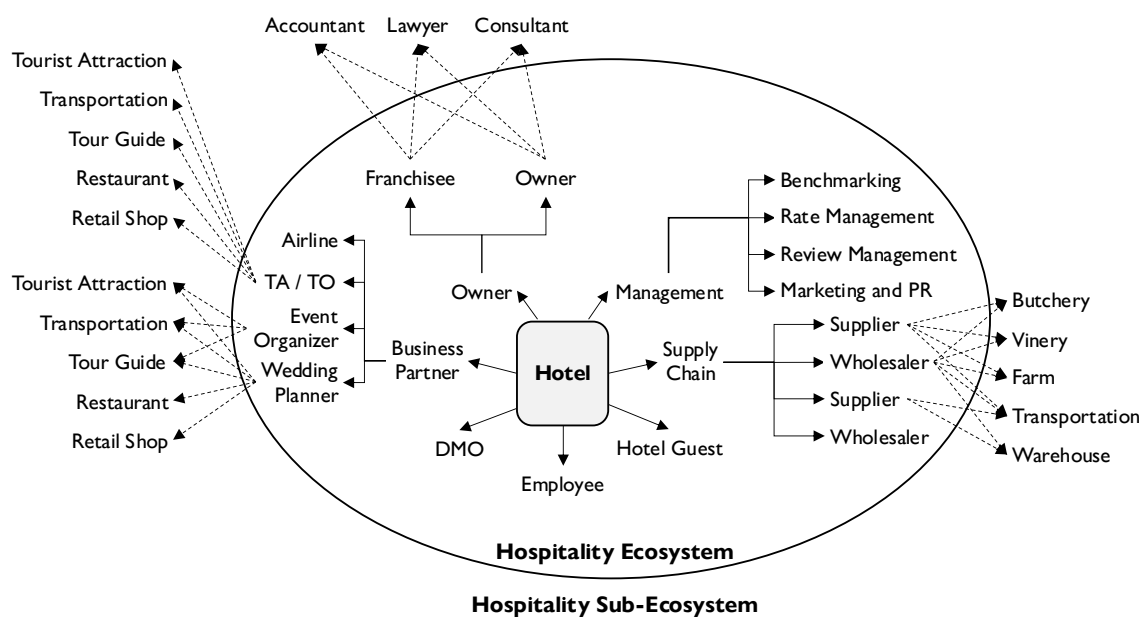


Figure 27: Ecosystem of hospitality (Philipp et al., 2022, p. 14)

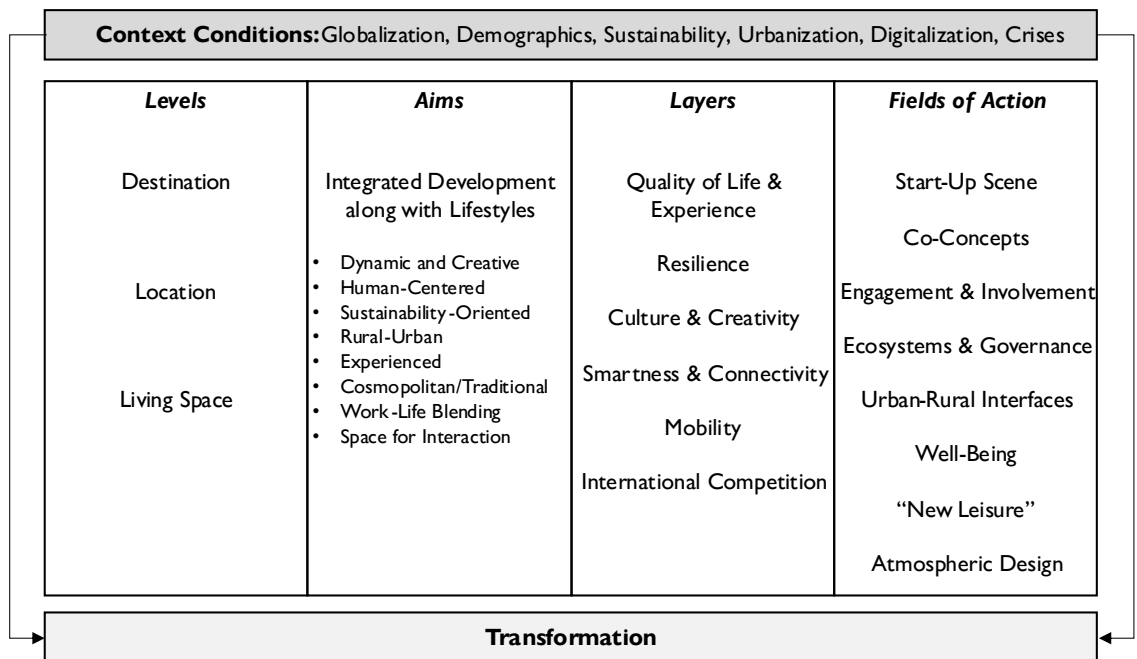


Figure 28: Mobility ecosystem with IT-enabled value formation (Schulz et al., 2021, p. 11)

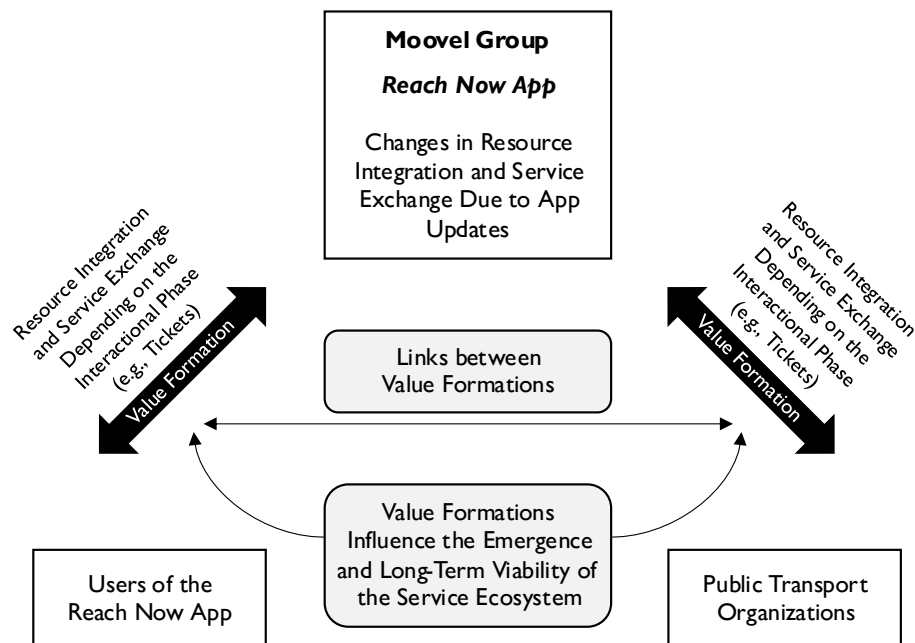


Figure 29: Smart food and beverage network (Leung & Loo, 2020, p. 62)

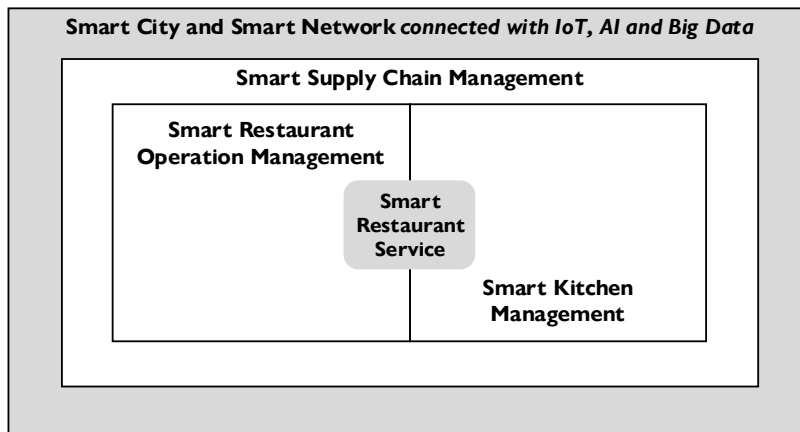
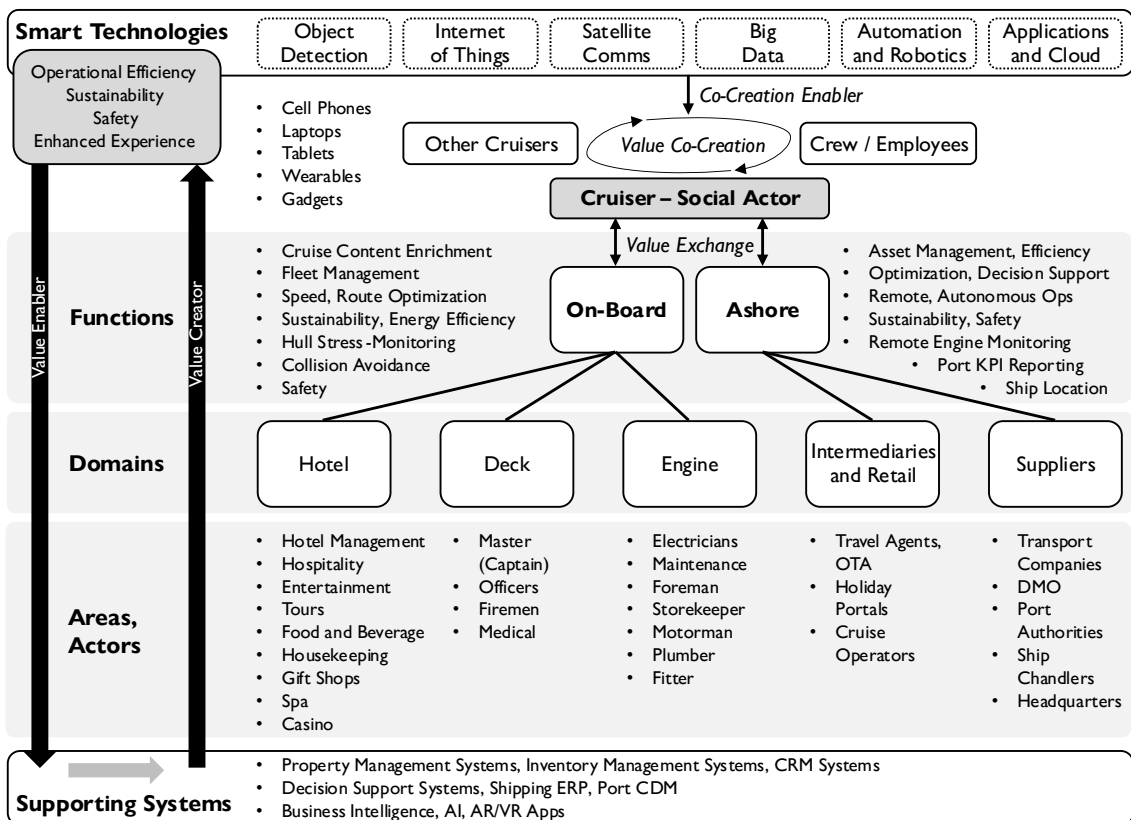


Figure 30: Smart cruise ecosystem framework (Buhalis et al., 2022, p. 640)



4.1.3 Technological systems

When looking at conceptualizations of smart destinations and tourism ecosystems, technology apparently plays a major role. Many sources expect that technological solutions allow for seamless integration of various stakeholders, devices, and sources of data, which could help make tourism smarter, more sustainable, resilient, and productive. This subsection provides a selection of such technological systems and applications for tourism and hospitality. It starts with a high-level concept of technology-enabled collaboration (Figure 31), presents a range of frameworks on robots, AI, and service automation (RAISA) in tourism information systems, and ends with data-based but rather conceptual solutions such as personalized recommender systems (Figure 46). While these excerpts remain abstract, actually available solutions are presented in section 4.3.

Figure 31: Technology-enabled collaboration in tourism (Mollah & Sebata, 2022, p. 44)

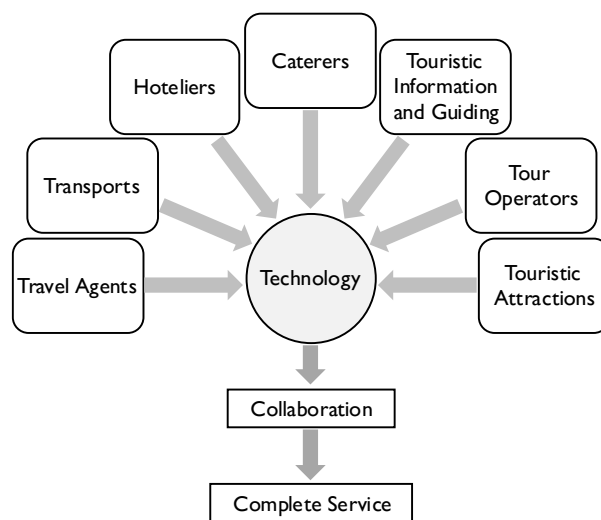


Figure 32: Robots, AI, and service automation in tourism (Ivanov & Webster, 2019a, p. 22)

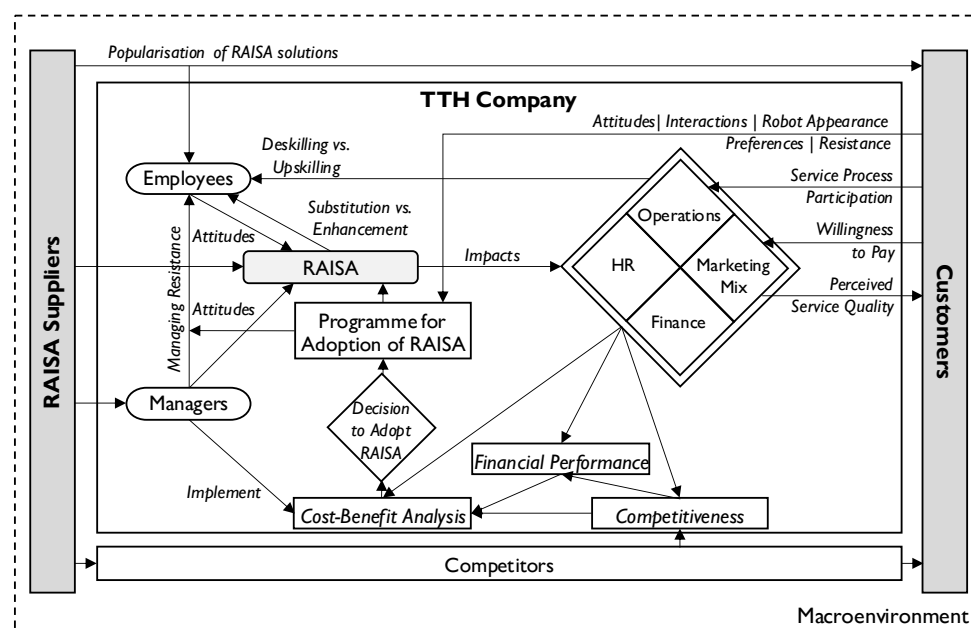


Figure 33: Layers of IoT for destination management (Arsovski & Arsovski, 2019, p. 993)

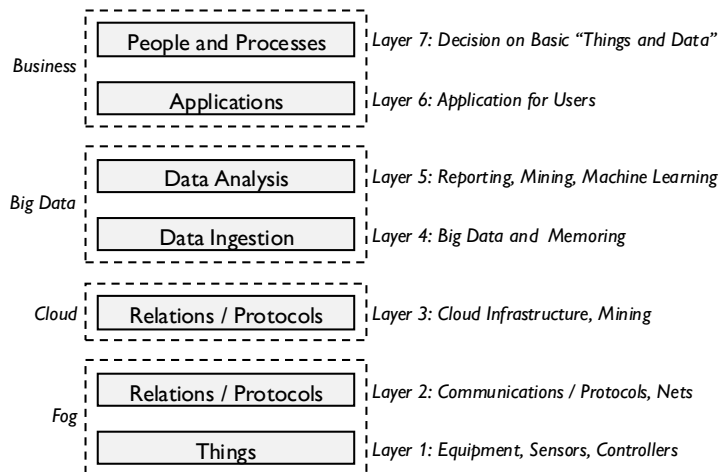


Figure 34: Ambient intelligence for tourism (Buhalis, 2019, p. 269)

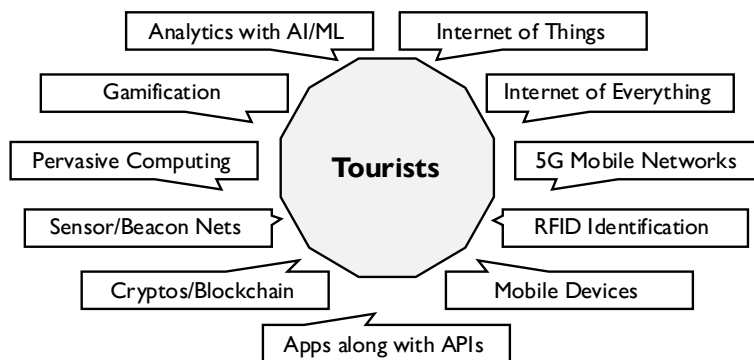


Figure 35: AI methods and applications in tourism (Doborjeh et al., 2021, p. 1161)

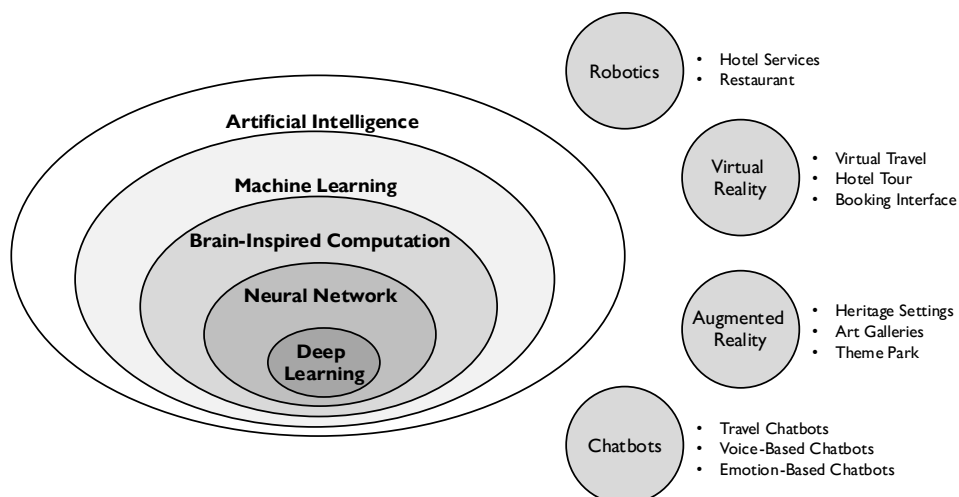


Figure 36: Business intelligence platform for tourism analysis (Bustamante et al., 2020, p. 8)

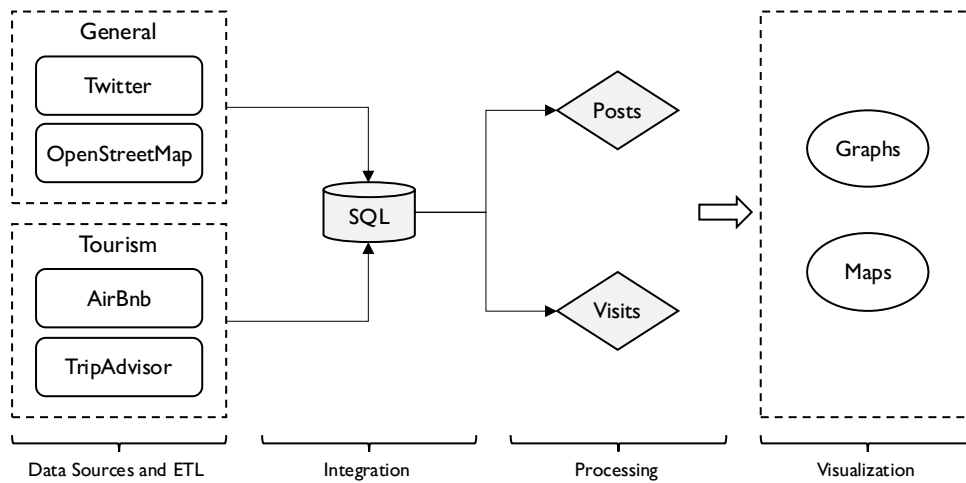


Figure 37: Tourism forecasting with big data (Song & Liu, 2017, p. 25)

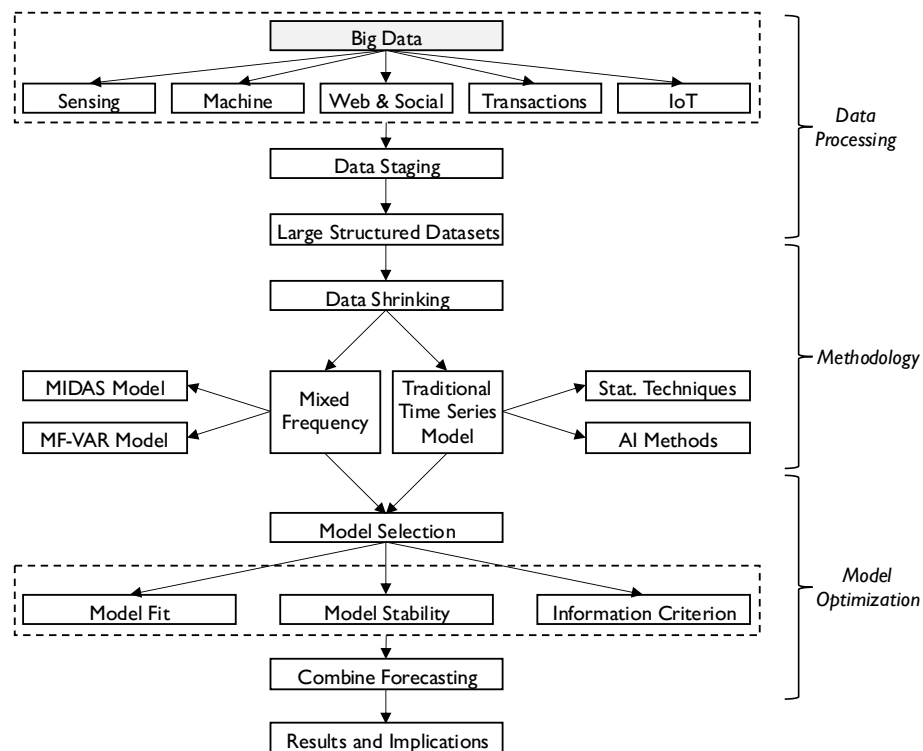


Figure 38: Framework of a tourism analytics hub (Stylos & Zwiendelaar, 2019, p. 175)

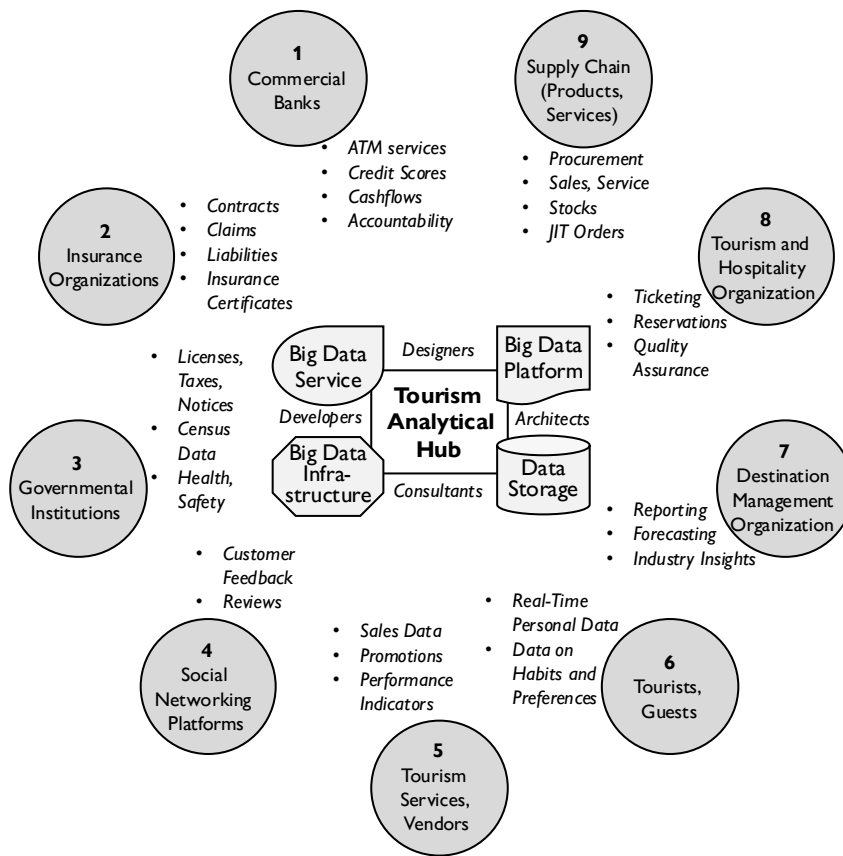


Figure 39: Smart technology for personalized tourism (Neuhofer et al., 2015, p. 251)

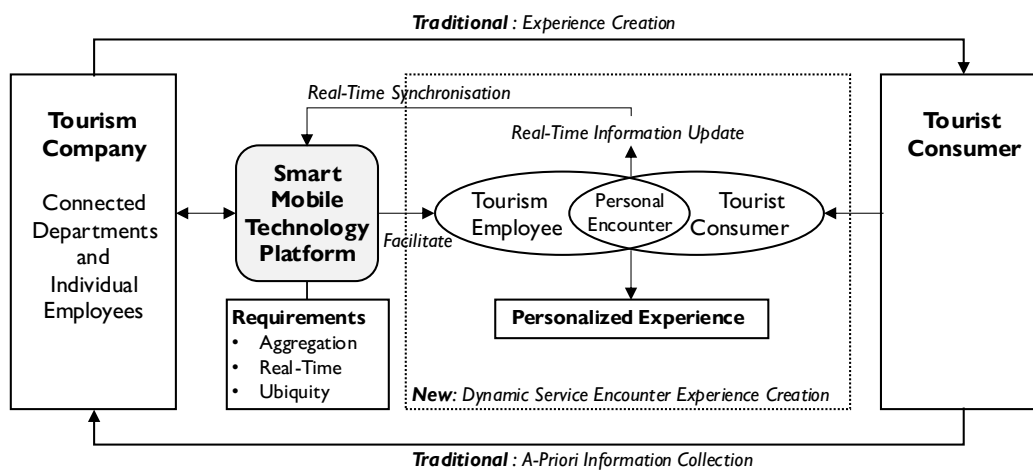


Figure 40: Data flow in a smart hospitality network (Buhalis & Leung, 2018, p. 47)

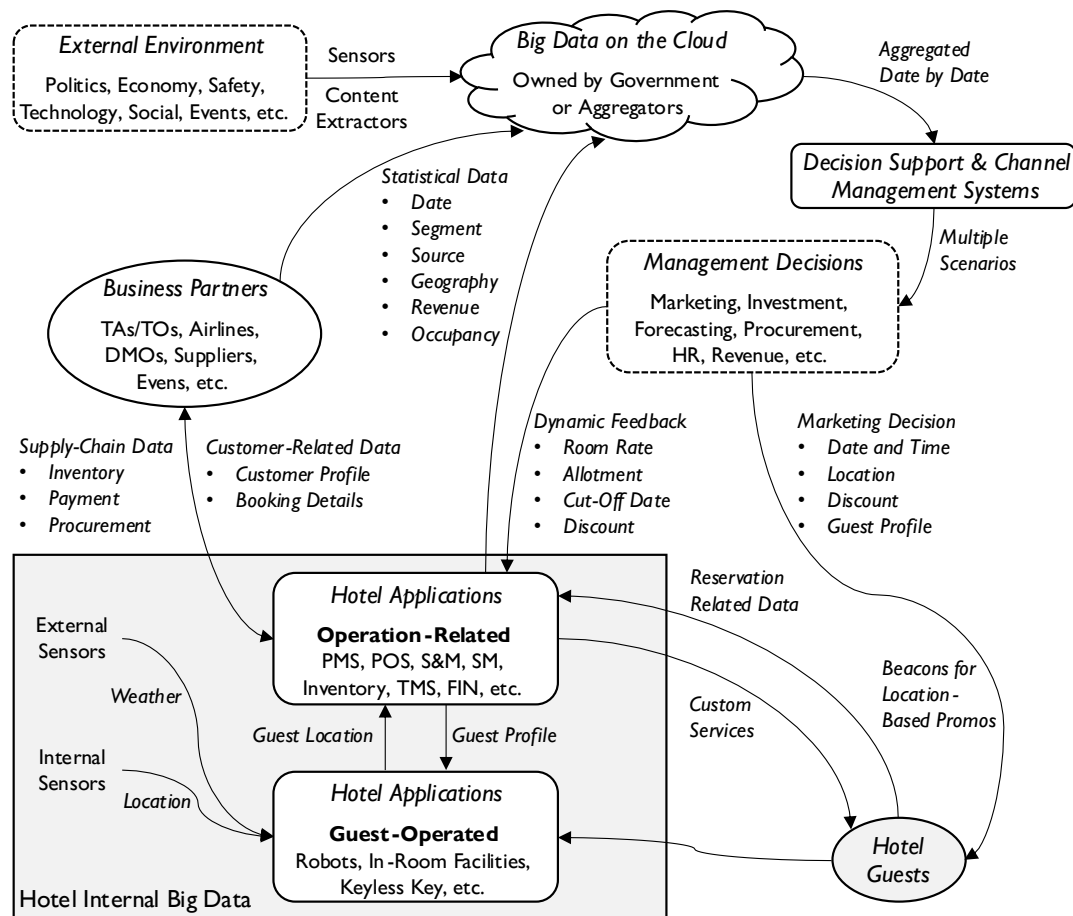


Figure 41: Opportunities for AI in tourism and hospitality (Doborjeh et al., 2021, p. 1167)

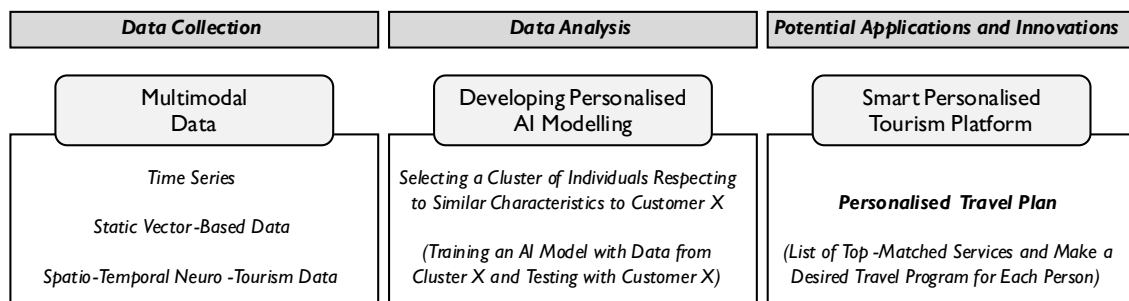


Figure 42: Interorganizational information system (IOIS) with KPIs (Louillet et al., 2021, p. 343)

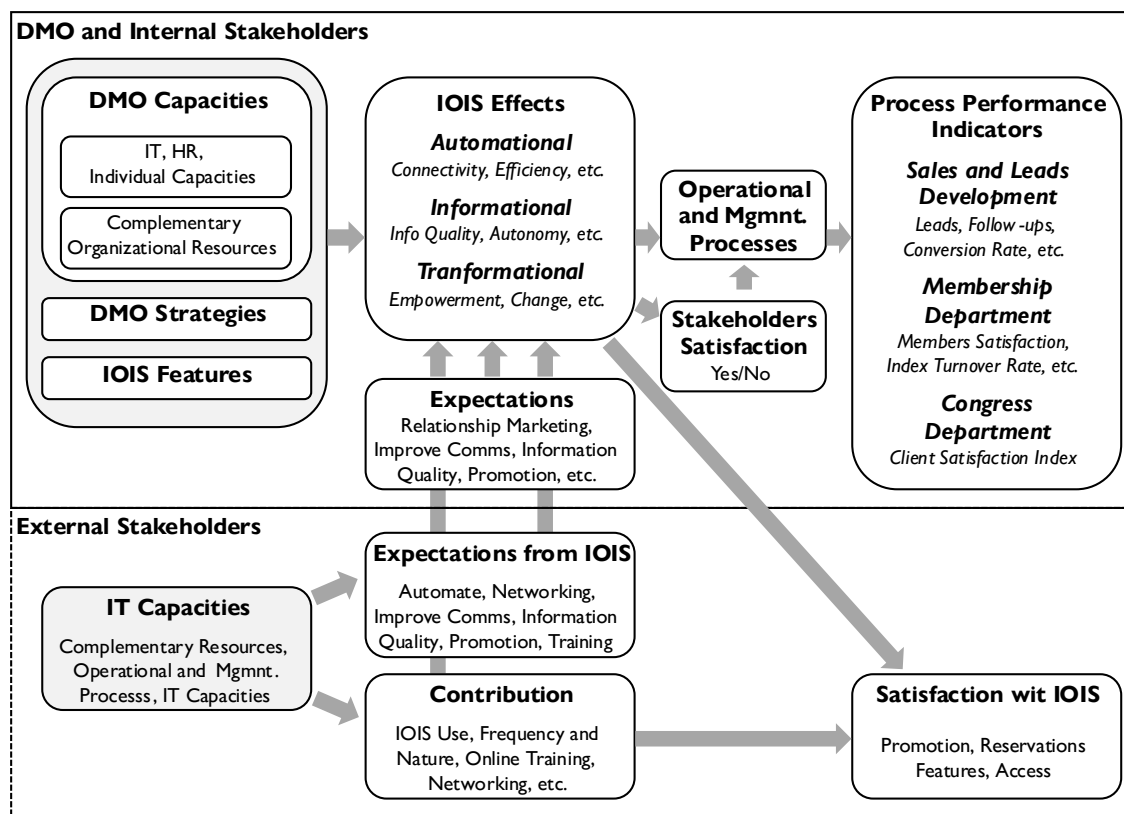


Figure 43: Framework of smart tourism application based on big data (Jia et al., 2022, p. 5)

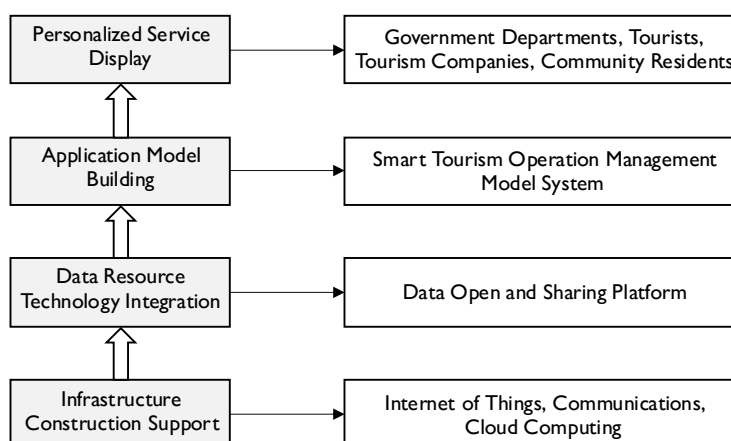


Figure 44: Quantified travelers in smart destinations (Choe & Fesenmaier, 2017, p. 72)

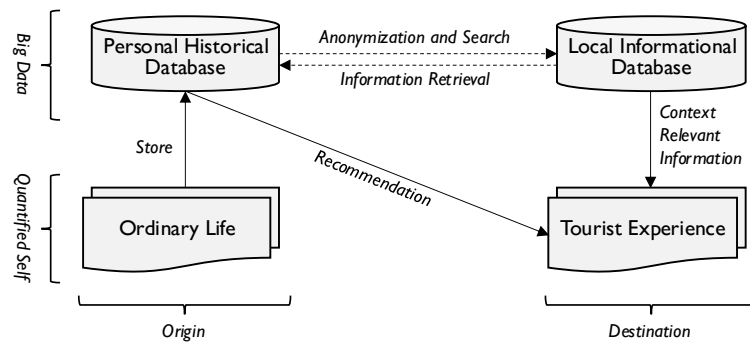


Figure 45: Data-based individual recommender system (Cuomo et al., 2022, p. 4)

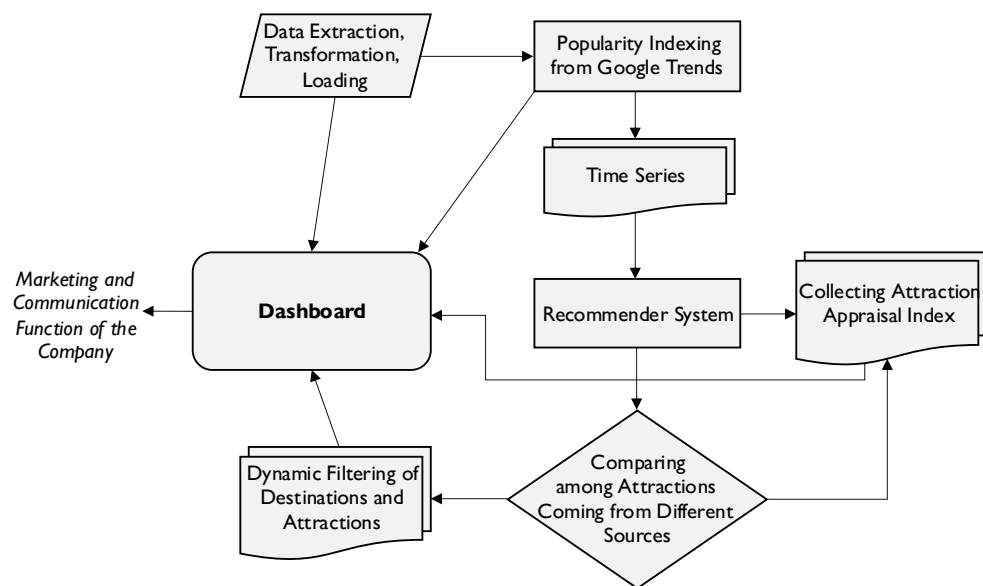
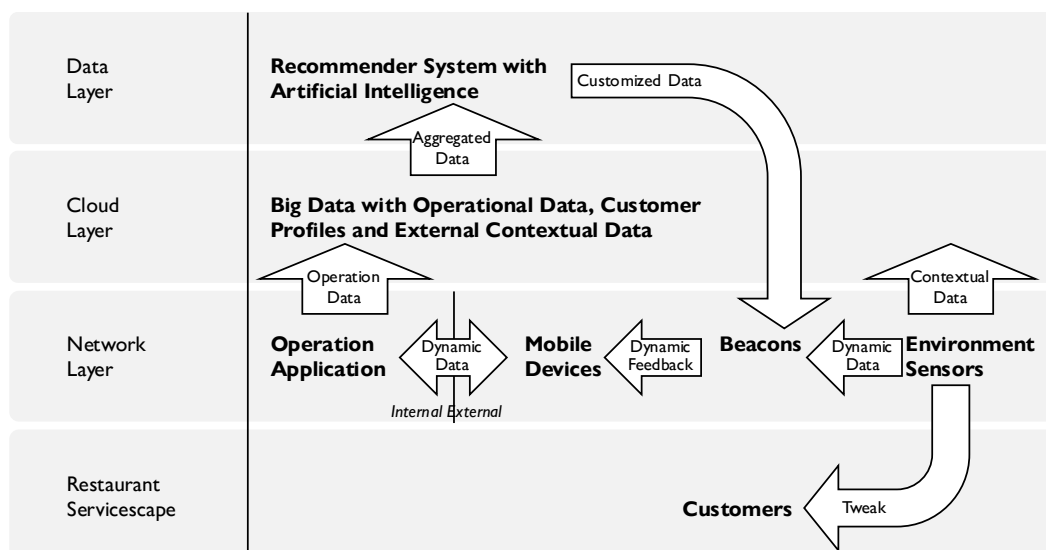


Figure 46: Restaurant servicescape with recommender system (Leung & Loo, 2020, p. 52)



4.1.4 Technology attributes and adoption

While technology seems key to make the provision of tourism services smart and sustainable, it is less clear whether customers will adopt it as expected. Therefore, a considerable amount of research in the field of smart tourism is based on theories such as technology acceptance, perceived value, service-dominant logic, and motivation theory (Ye et al., 2020, p. 9). Many researchers focus on the investigation of relevant attributes for customer satisfaction or customer adoption of tourism technologies such as apps and robots. The last part of this subsection starts with a series of comparable research frameworks on smart tourism attributes and technology adoption (Figure 47 to Figure 56) and is then concluded by a collection of typical utility components of smart tourism apps (Table 6 and Table 7).

Figure 47: Smart tourism technology framework (Goo et al., 2022, p. 13)

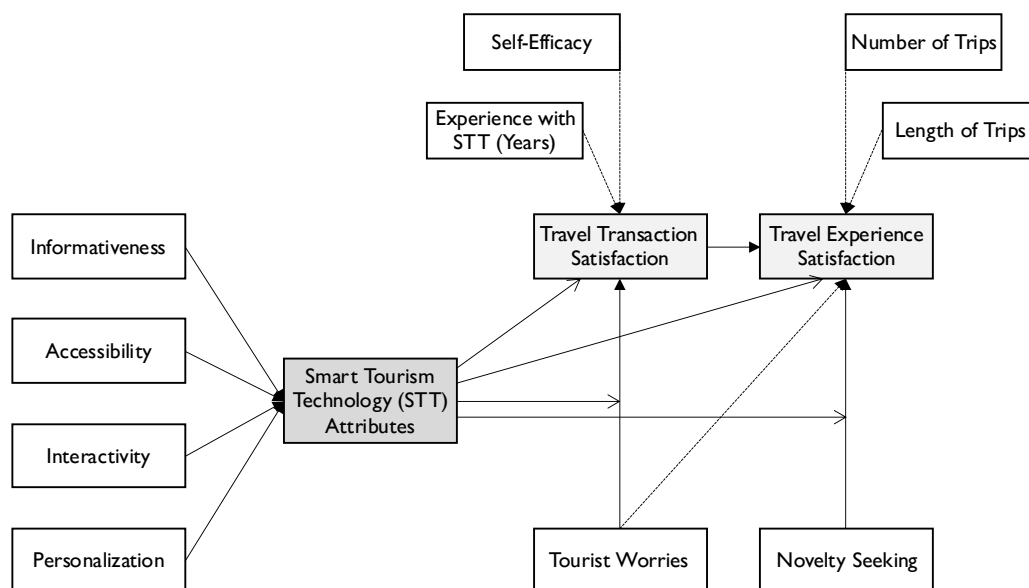


Figure 48: Smart tourism technology framework (Huang et al., 2017, p. 766)

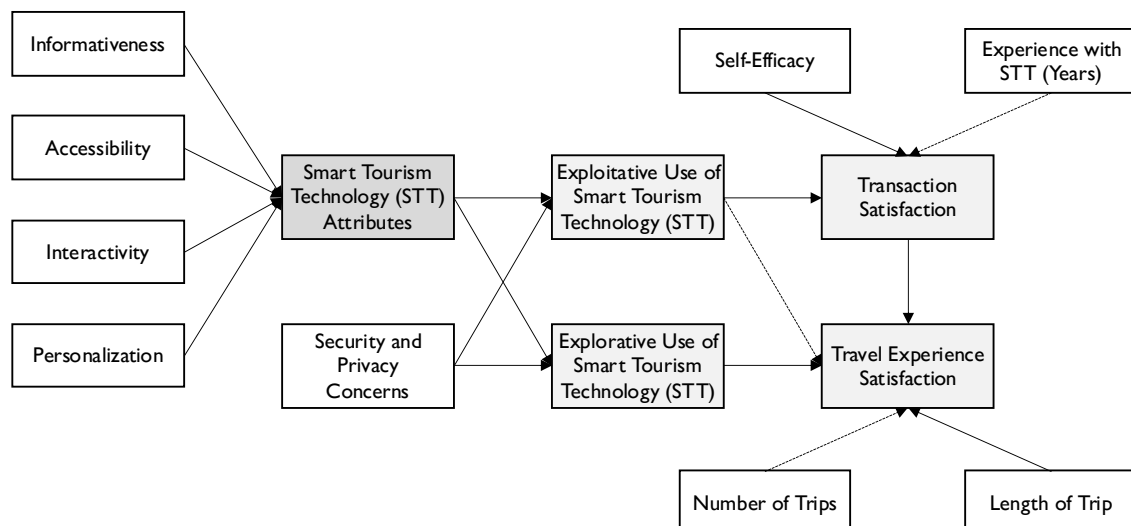


Figure 49: Impact of smart tourism technology on experience (Jeong & Shin, 2019, p. 1468)

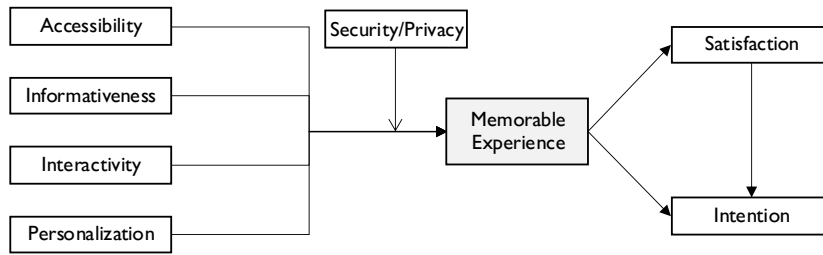


Figure 50: Smart tourism technology framework (Yoo et al., 2017)

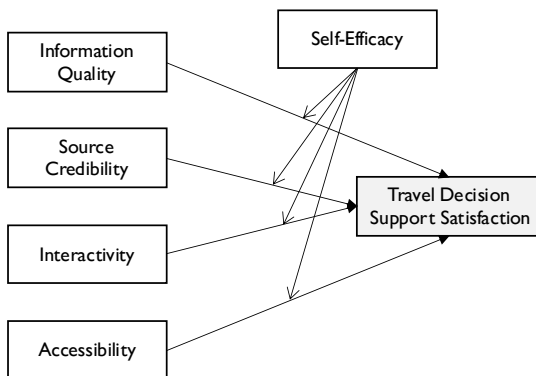


Figure 51: Value propositions and their impact on service experience (Li et al., 2021, p. 297)

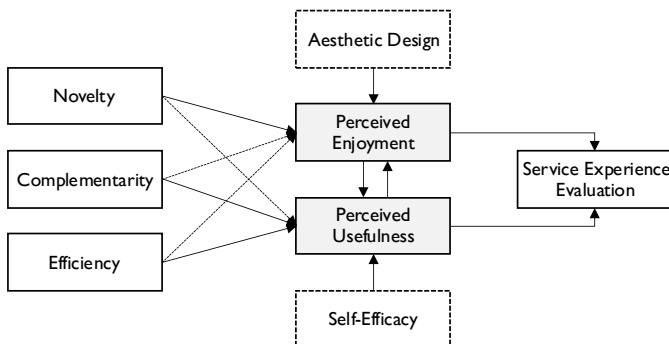


Figure 52: Mobile applications in tourism framework (Tan et al., 2017, p. 563)

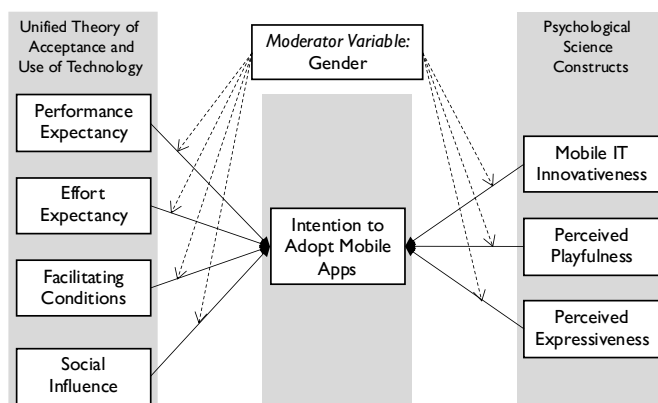


Figure 53: Service robot acceptance model (Wirtz et al., 2018, p. 916)

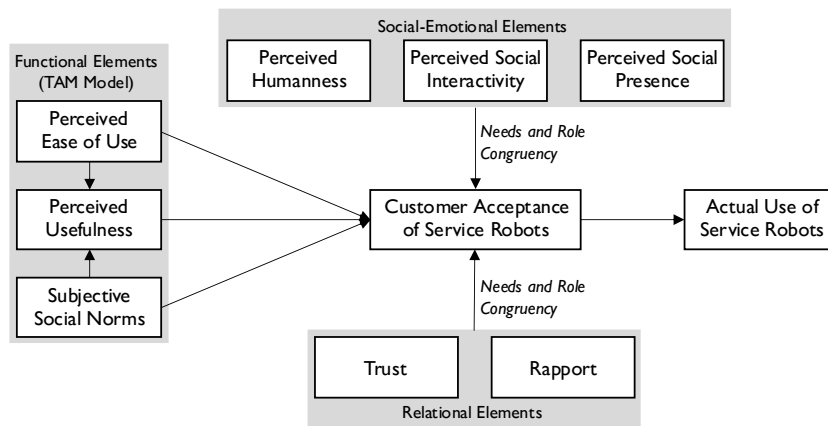


Figure 54: Conceptual model of self-service-technology adoption (Kelly et al., 2019, p. 64)

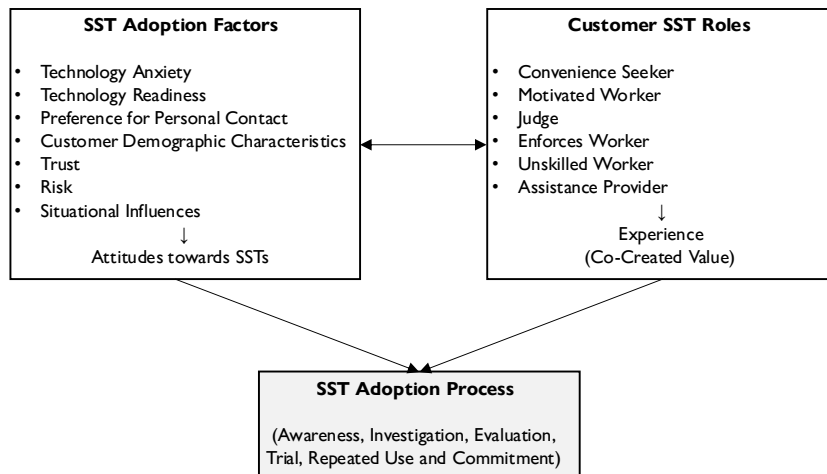


Figure 55: Value-centric validation of robotic service involvement (Wu et al., 2021, p. 801)

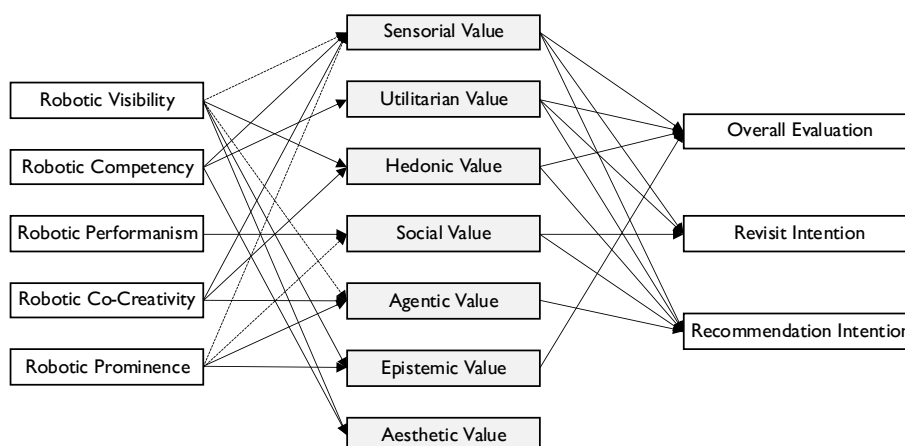


Figure 56: Conceptual model of smart service experiences (Kabadayi et al., 2019, p. 329)

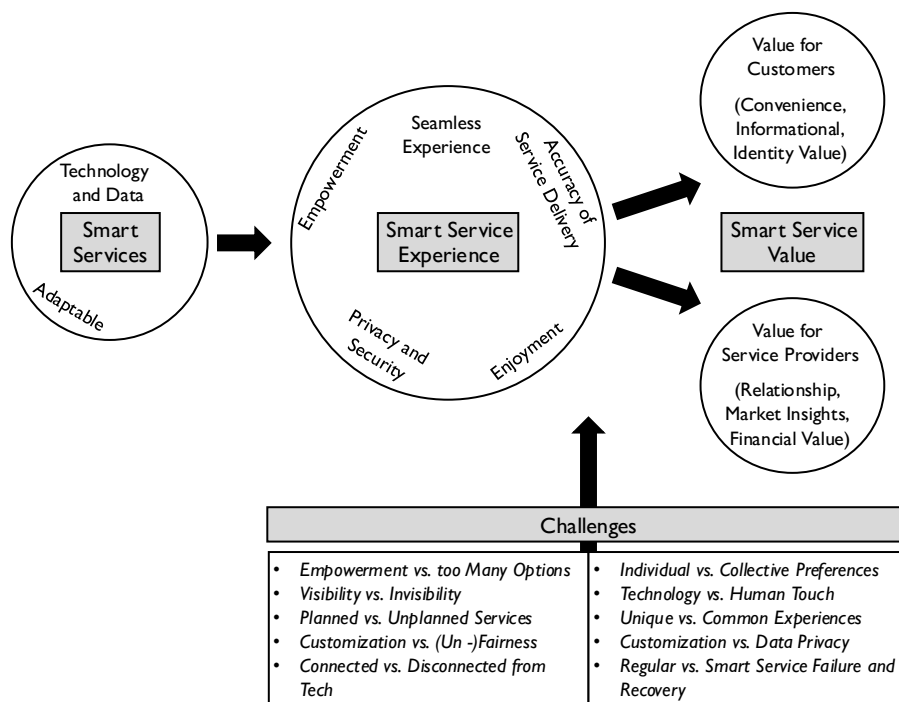
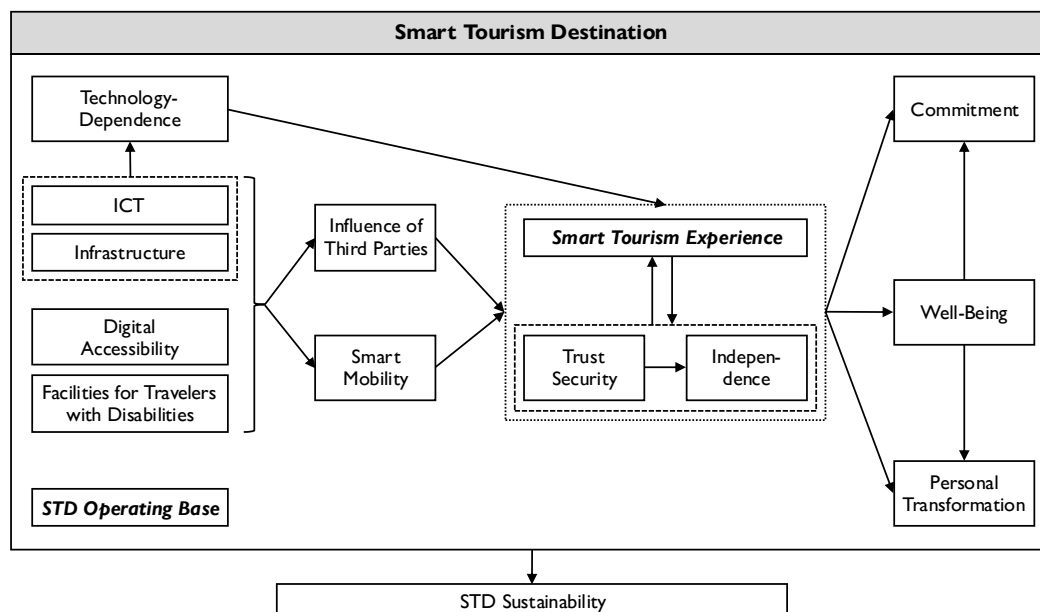


Figure 57: Formation of smart tourism experiences (Corrêa & Gosling, 2020, p. 424)



The adoption of robots, self-service apps, and smart service experiences can be challenging. Wirtz et al. (2018, p. 919) suggest replacing emotionally-socially simple processes with robots while combining humans and robots for tasks that are complex on both an emotional-social and cognitive-analytical dimension. It can be assumed that certain service components can be delegated more easily to digital support systems than others.

The following tables contain utility components that are already broadly applied in digital smart tourism solutions. Ammirato et al. (2021, p. 9) analyze digital business models in cultural tourism and identify a number of key components in such apps while Chung et al. (2021, p. 3) do so for catering apps.

Table 6: Selected utility components in apps for cultural tourism (Ammirato et al., 2021, p. 9)

Component	Key areas to be considered for sustainable development
Offline use	App features are available also without an internet connection
Social networking	Virtual connectedness with other tourists and cultural tourism stakeholders
Users' profile customization	Information services are tailored according to a user's preferences, profile and app use
Timesaving	The app reduces time and a user's efforts in carrying out tourism activities, e.g. skipping the queues
Reviews	Opportunities to give/read opinions, ratings, suggestions about tourism services, artworks, monuments, places, ...
Interaction with locals	Personal connectedness with people who know the place
Certificate information sources	Trustworthiness of information sources. It affects a user's assessment of the reliability of the information content
Storytelling	The app shares anecdotes, stories, tales and legends about some cultural tourism destinations
Near to me	Information is customized according to a user's position/location
Recognize the point of interest	Recognize a place, a monument, an artwork, through a photo and/or a description
Assurance	Features reducing the impact of an adverse event during the tourism experience, e.g. travel insurances, ...
Multi-language interaction	App services are available in several languages, according to a user's preferences
Itinerary proposals	The app proposes a cultural itinerary based on a user's preferences
Economic convenience	Opportunity to save money through discount, special offering, ...

Table 7: Selected utility components in apps for catering (Chung et al., 2021, p. 3)

Component	Main characteristics
Grocery delivery	Data mining; supplemental nutrition assistance
Food delivery	Smart partial least squares Expectancy confirmation model Unified theory of use and acceptance of technology Pleasure arousal dominance
Food coupons	RFID Price discrimination
Recipes	Speech processing
Food and nutrition for sports	Self-tracking
Calorie trackers	RFID Eating disorder pathology
Food waste reduction	Internet of things
Restaurant table reservations	e-CRM Revenue per available seat hour
Reviews and rating	Coding schemes
AR for restaurant exploration	Immersive technology

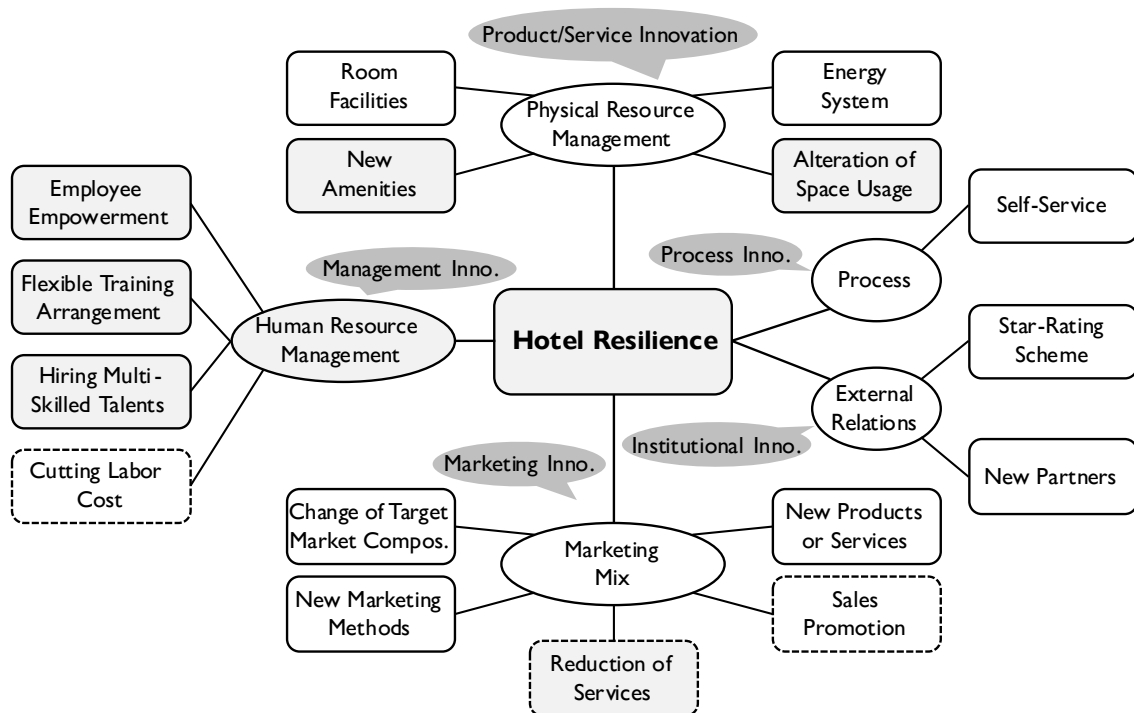
4.2 Process view

The following subsections present all excerpts from the literature review that provide a process perspective on the topic. It is structured as follows: In the first section, the innovation process is briefly addressed (4.2.1). In the second section, issues of competitiveness and productivity are shown (4.2.2). In the third section, business models and service blueprints are presented (4.2.3). In the fourth section, business and customer processes as well as facilitating technologies are gathered (4.2.4). In general, the process view is more specific than some of the highly conceptual frameworks from the system view. However, the most tangible content is presented in the subsequent subchapter, which contains some already available technological solutions (4.3).

4.2.1 Innovation, development, and transformation

The goal of innovation, development, and transformation usually is to make businesses more competitive, sustainable, and resilient. Shi et al. (2021, p. 2896) present a framework of hotel resilience through various types of innovation. However, literature on the implementation or execution of innovation processes has been excluded from this review (see also 2.1). This review is more about innovation contents than innovation processes; for an exemplary innovation process in a quick service restaurant: see Ottenbacher and Harrington (2009, p. 529). Nevertheless, there are several relevant excerpts on specific, technology-based innovation and digital transformation that are briefly presented here.

Figure 58: Hotel resilience through innovation (Shi et al., 2021, p. 2896)



Mohanty (2020, p. 267) provides a list of technology-applications that could facilitate sustainable development of tourism based on its developmental stage.

Table 8: Technology-driven sustainable development (Mohanty, 2020, p. 267)

Stage of tourism cycle	Key areas to be considered for sustainable development	Usage of technology and tools
Exploration	Accessing tourist movements, mapping potential destinations, developing destination maps, improving destination infrastructure	GIS, GPS, community mapping
Involvement	Managing tourist and local community interaction, moderate advertising, improving transportation facilities	ITS, social media marketing tools, booking portals, TISs, CI
Development	Heavy marketing, building man-made attractions, focusing on tourist satisfaction, promoting public-private partnership, accessing carrying capacity	EIA, ICT footprint measurement tool, interactive texts, issue tracking, software and discussion forums, DMS
Consolidation	Managing tourist inflow, implementing effective legislation and licensing, tax management, disseminating public information	LBS, ICT tools for good tax governance, ICT tools for legislation and licensing
Stagnation	Reducing tourist inflow, restoring environment, educating the tourists	ICT-based tools for de-marketing, EMIS, eco-labeling, carbon calculators
Decline	Designing innovative experiences, resource mapping, generating alternate livelihood opportunities	Resource mapping, virtual tourism, sustainable livelihood tools
Rejuvenation	Marketing, re-marketing of destination, re-structuring and re-branding of destination	Marketing tools for repositioning, destination re-structuring tools, ICT-based marketing tools

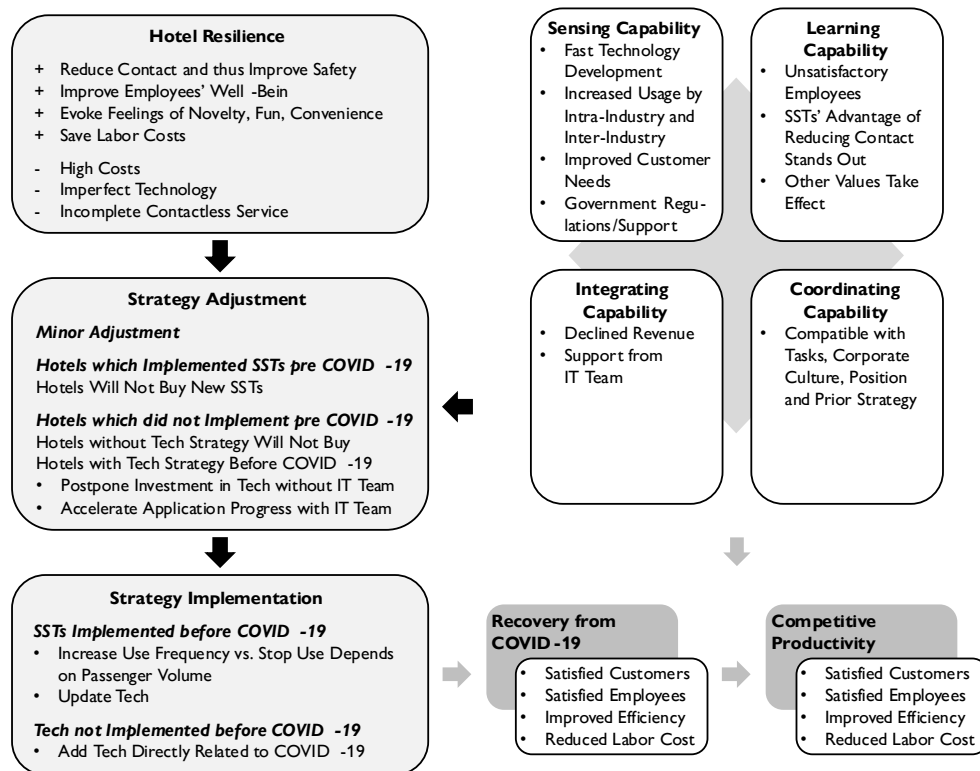
In its tourism trends and policies report, the OECD presents a list of issues that can be solved by digitally transforming the traditional business (OECD, 2020, p. 72). Implications are provided in the following table, which shows that increased competitiveness and efficiencies are key – especially for the many small and medium enterprises (SME) in the tourism and hospitality sector.

Table 9: Value creation through digital transformation in tourism (OECD, 2020, p. 72)

Issue	Traditional business	Digital business	Implications for customers	Implications for SME
Customer interaction and engagement	Face-to-face product facing selling strategies	Customer-facing tools and technologies facilitate a seamless customer journey with multiple customer touch-points and customer-led interaction	Enhanced visitor experiences through mixed face-to-face and digital interactions	Reduced transaction costs, real time engagement
Market analysis and marketing	Market projections, segmentation	Data analytics, intelligent decision-making, real-time customer data and data-sharing	Customized products, experiences; data privacy concerns	Increase products-consumer match; data security and privacy management
Business management processes	Management cycle (annual, quarterly, monthly)	Process automation, increased efficiencies, adaptive management	Price reductions, product improvements	Management efficiencies and timeliness, increased cost efficiencies
Business planning	Business projections and strategic planning	Adopt continuous improvement; rapid testing; real time feedback and decision-making		Management efficiencies and timeliness, increased cost efficiencies, production innovation
Product development	Led by product investment and financial assets	Customer-led and driven by information assets and co-creation and collaboration	Greater choice, customization, satisfaction	Increase competitiveness, cost efficiencies, reduced risk in new product development
Business models	Traditional business-as-usual, supplier and customer roles clearly defined	Collaborative, networked commerce, open architecture, multi-sided platforms blur roles of consumers-producers (prosumers).	Greater choice, seamless experiences, increased satisfaction	Management efficiencies and timeliness, increased cost efficiencies

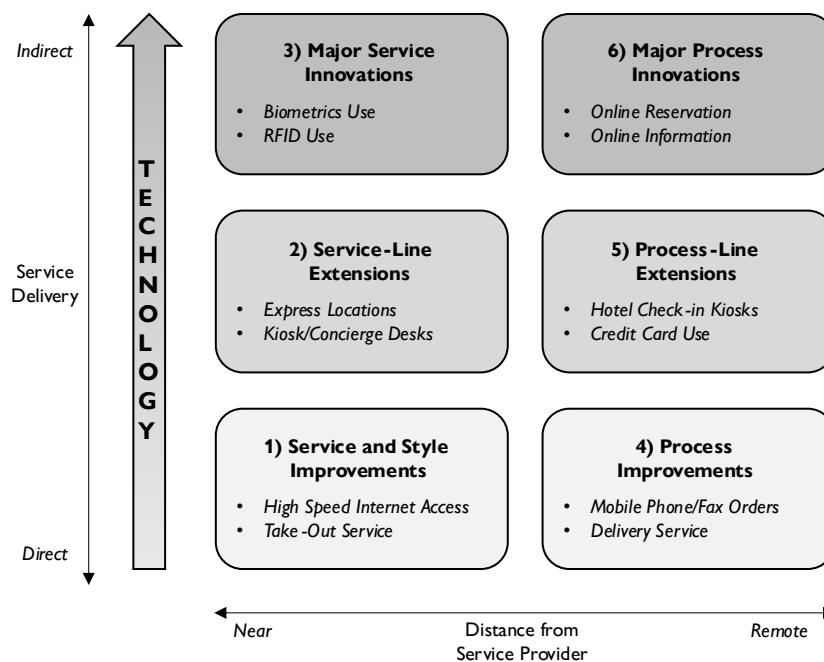
Liu and Yang (2021, p. 2925) present a specific framework of a strategic management and dynamic capabilities regarding the implementation of self-service technologies to improve productivity.

Figure 59: Framework of strategy and dynamic capabilities (Liu & Yang, 2021, p. 2925)



Khan and Khan (2009, p. 515) portray the changing shape of hospitality services and present a taxonomy of service designs by type of service delivery and distance from the provider.

Figure 60: Categories of service (re-)design (Khan & Khan, 2009, p. 515)

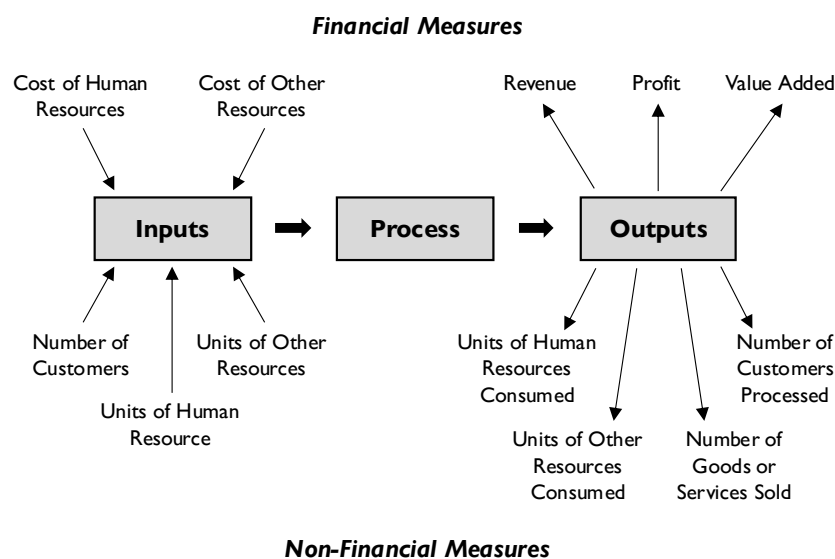


4.2.2 Competitiveness and productivity

As seen in the previous subsection, most (technology-based) innovations and transformations ultimately aim at improving competitiveness and productivity. While the pandemic has boosted some technologies, the OECD states that “productivity-enhancing technologies (e.g. cloud computing, data analytics, revenue management software) have generally received low uptake in tourism, while innovative technologies (e.g. augmented reality, geotagging) are generating, customizing and delivering in ever more novel ways, new visitor products, services and experiences” (OECD, 2020, p. 60). Labor productivity in the sector is below average, which can be seen in the following numbers: Tourism amounts to “just” 4.4% of GDP, but 6.9% of total employment (across OECD countries, on pre-pandemic levels). For Switzerland, the corresponding values are about 35% below OECD average with 2.9% of GDP and 4.4% of employment (OECD, 2020, p. 18).

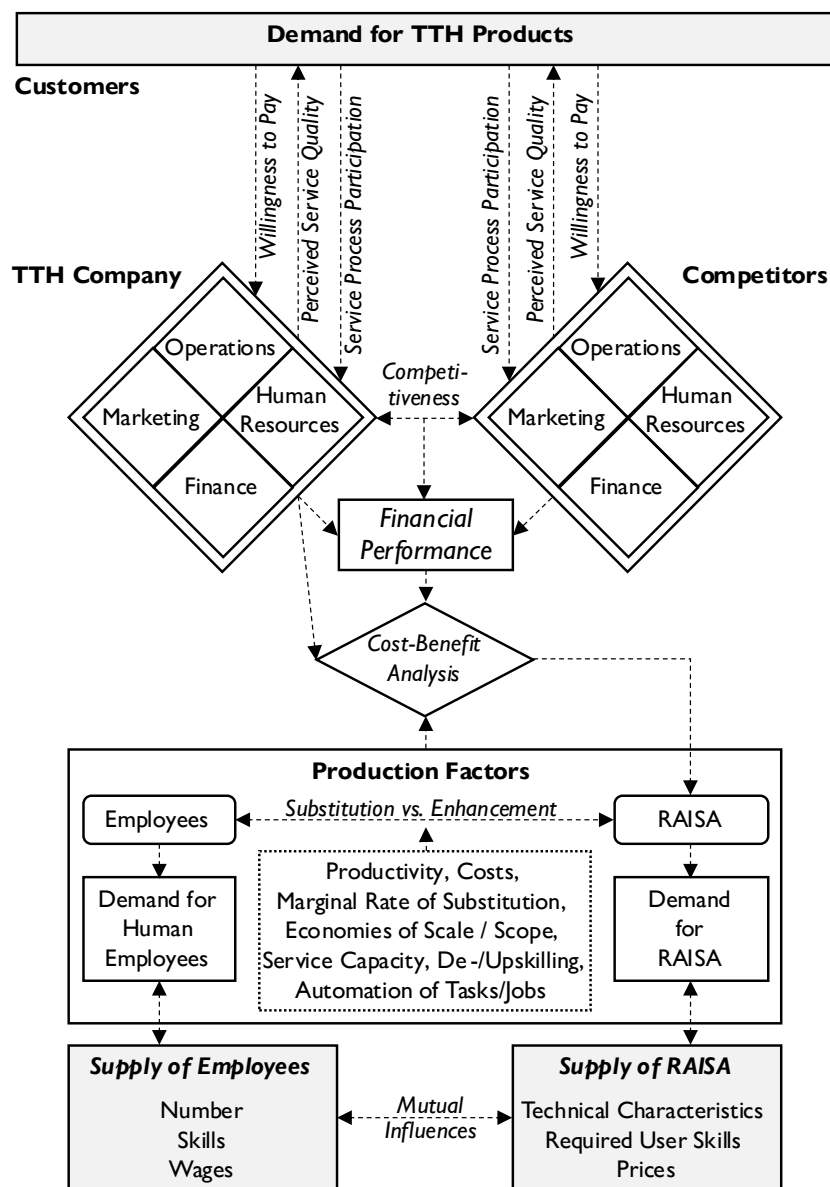
In economics, productivity is acknowledged to be key for competitiveness of regions and firms. It measures the value of output produced per input provided and depends on both quantities and qualities of factors (Cavalheiro et al., 2019, p. 240). Johnston and Jones (2004, p. 201) state that “despite the importance of productivity to many service organizations it is surprising that there is relatively little empirical research on this topic”, which still seems true today. A possible explanation for the lack of attention can be found in a paper by Ingram and Fraenkel (2006): The authors show that many industry practitioners reject the concept as they associate productivity increases with service quality reductions. However, this understanding of productivity is – at least partially – wrong. If done well, productivity improvements both reduce costs and increase (or at least maintain) quality. Johnston and Jones (2004, p. 203) emphasize that productivity improvements are about increasing utilization (reducing planned loss), increasing efficiency (minimizing avoidable loss), and improving operational productivity. However, it is important to not just focus on operational productivity of the supplier but also keep an eye on customer productivity and satisfaction. If a task is outsourced to the customer in an unsatisfactory way, productivity will be negatively affected in the longer term.

Figure 61: Input and output variables (Johnston & Jones, 2004, p. 204)



While Johnston and Jones (2004, p. 204) provide generic variables for productivity measurement, Ivanov and Webster (2019b, p. 50) present a detailed list of monetary and non-monetary variables for travel, tourism, and hospitality. Furthermore, the authors present a comprehensive economic framework on productivity improvement through robots, AI, and service automation (RAISA) in the tourism sector (Ivanov & Webster, 2019b, p. 41).

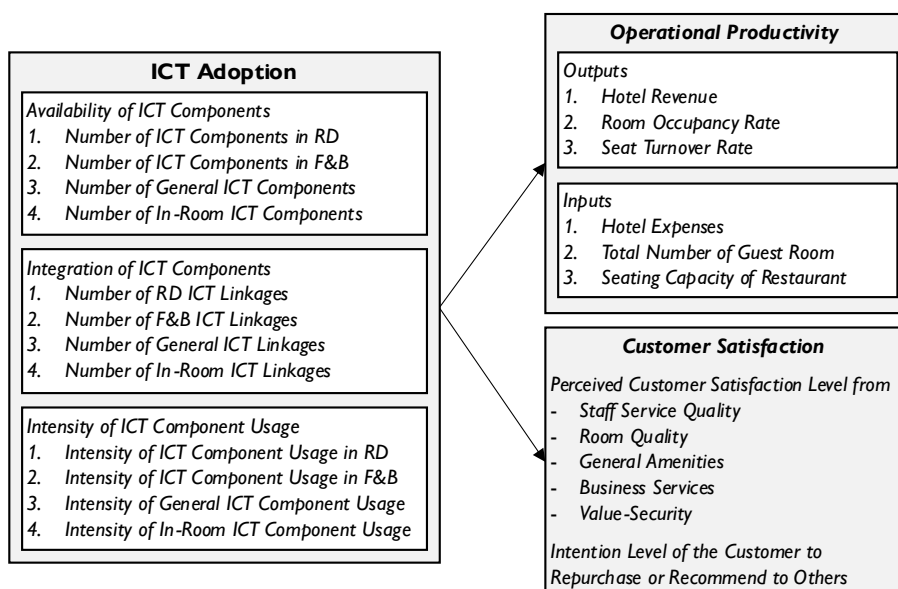
Figure 62: Economic framework of technology in tourism (Ivanov & Webster, 2019b, p. 41)



Ivanov and Webster (2019a, p. 28) emphasize the importance of productivity gains to address the labor force crisis. They portray the substitution of labor through technology as a strategy with lower risk regarding social and political resistance and tensions than alternative solutions such as the (short term) import of people or the (longer term) “production” of new labor forces. However, not all technological solutions might be available or adopted in time.

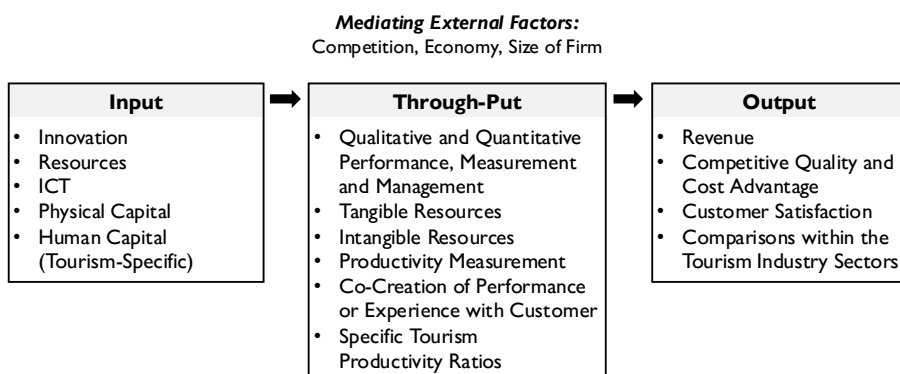
The study by Sirirak et al. (2011) investigates the effect of “ICT adoption on hotel performance from both the operational and customer perspectives, simultaneously”. Their findings show that the adoption of ICT in an enterprise has a “significant positive relationship with hotel performance”, but “influences operational productivity more than customer satisfaction for three star hotels” (Sirirak et al., 2011, p. 47).

Figure 63: Research framework on ICT and productivity (Sirirak et al., 2011, p. 36)



However, productivity is not just dependent on technological solutions and tools but also driven by organizational or social innovation such as new forms of co-creation and co-production. Furthermore, with the help of centralization and outsourcing, efficiency gains can be expected.

Figure 64: Simple tourism productivity model (Brien et al., 2022, p. 8)



4.2.3 Business models and service blueprints

The reviewed literature contains only a few business model frameworks. While the OECD report from 2020 shows a typology of digitally enhanced business models in tourism, other sources just draw exemplary concepts or business model canvases, such as Aghaei et al. (2021, p. 6) on a blockchain platform or Díaz-Díaz et al. (2017, p. 205) on tourism promotion with AR.

Figure 65: Typology of digital business models in tourism (OECD, 2020, p. 76)

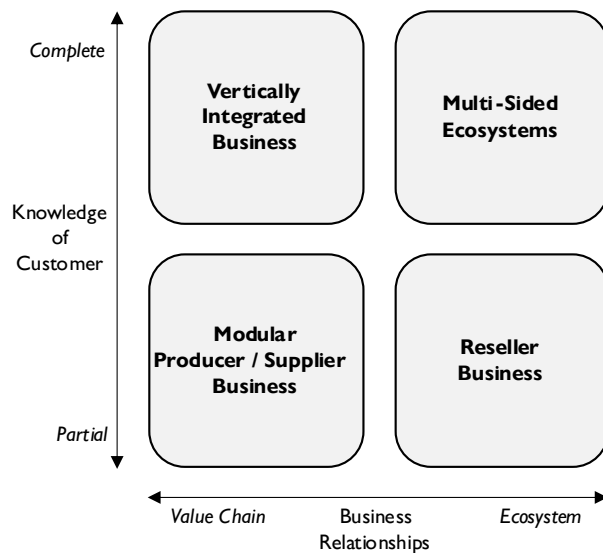


Figure 66: Tourism business model on blockchain platform (Aghaei et al., 2021, p. 6)

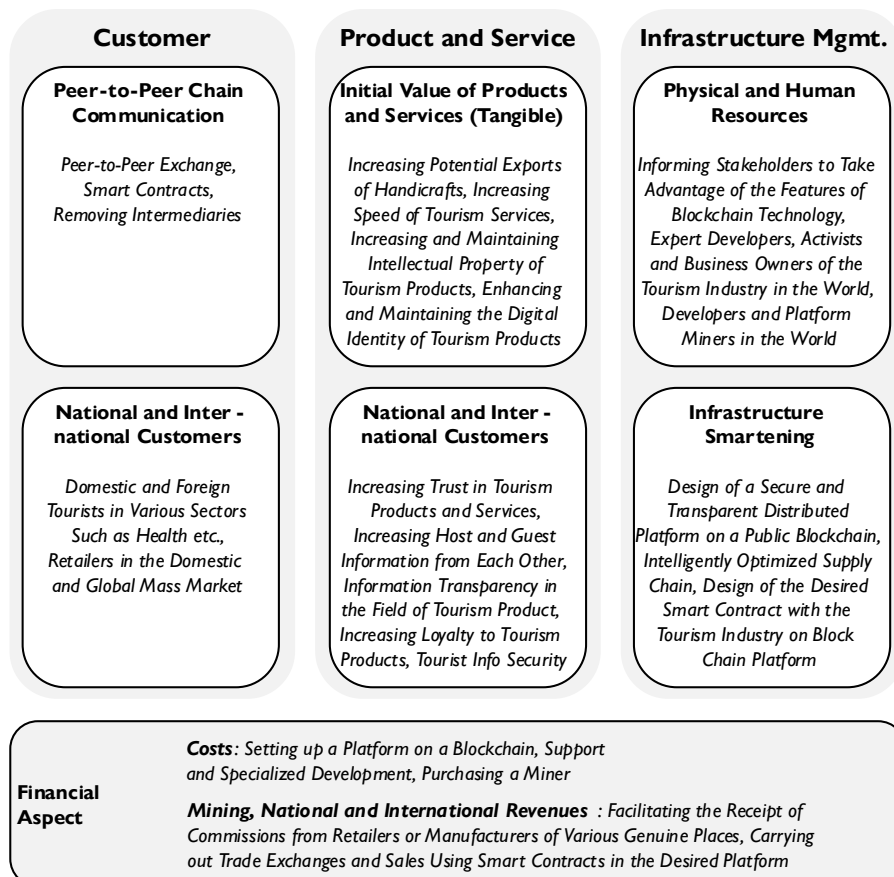
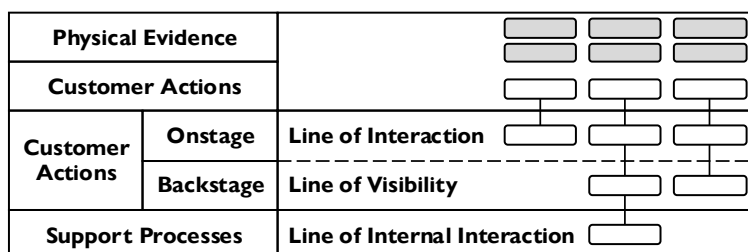


Figure 67: Tourism promotion with AR (Díaz-Díaz et al., 2017, p. 205) (versus of conventional)

Key Partners	Key Activities	Value Proposition	Customer Relation	Customer Segment
- Aggregation Service Providers - Content Providers and Brochure Producers - Public Buildings for Brochure Distribution	- Main City Building Description - Brochure Production - Mobile App Development - Attract Advertisers	- Portable and Geolocated Tourist Info - Financed by Advertising Spaces for Major Companies AND Small Businesses (Lower Costs, Higher Revenues)	- Personal Assistance to Tourists and Citizens - Self-Service of Brochures and Published Info - Self-Service of Mobile App	- Tourists - Citizens - Major Companies (Advertisers) - Small and Local Business (Advertisers)
	Key Resources - Employees - Stands - Budget for Publishing - Sensors and Data Platform - Mobile App		Channels - Info Stands' Staff - Handout - Info Website - Mobile App - Public Events - Mails - Adverts	
Cost Structure - Employee Salaries - Brochure Production - IT Infrastructure and Maintenance		Revenue Streams - Indirect Taxes from Tourists and Other Taxes - Entrance Fees to Public Buildings - Advertising in Brochure or Mobile App		
Social and Environmental Cost (Reduction) Fewer Printed Brochures (Thanks to Mobile App), Reducing Energy Consumption and CO2 -Emissions		Social and Environmental Benefit - Increased Revenues Allowing for Tax Reduction - Development of a Smart Business Ecosystem		

The paper by Díaz-Díaz et al. (2017) includes several more (smart city) business model canvases on services such as waste management with IoT, water supply with IoT, smart traffic management, smart street lightning, and more. However, these are primarily utility-oriented business models and not very relevant for tourism providers. Instead, the remainder of this subsection is focusing on another visual conceptualization of business configurations: With the help of so-called blueprints, services can be mapped and managed.

Figure 68: Exemplary service blueprint (Pandey & Kulshrestha, 2021, p. 612)



A service blueprint is a visual representation that helps improve efficiency and effectivity of services. It details the process and shows who is doing what at what point of time (Pandey & Kulshrestha, 2021, p. 611). Mapping a service helps identify (potential) fail points more easily (Pandey & Kulshrestha, 2021, p. 618). However, the screened literature only contains two real service blueprints: one for visits in a national park in New Zealand (Albrecht, 2013, p. 1060), and one for (post-pandemic) hotels in India (Pandey & Kulshrestha, 2021, p. 617).

Figure 69: Service blueprint for visits in a national park (Albrecht, 2013, p. 1060)

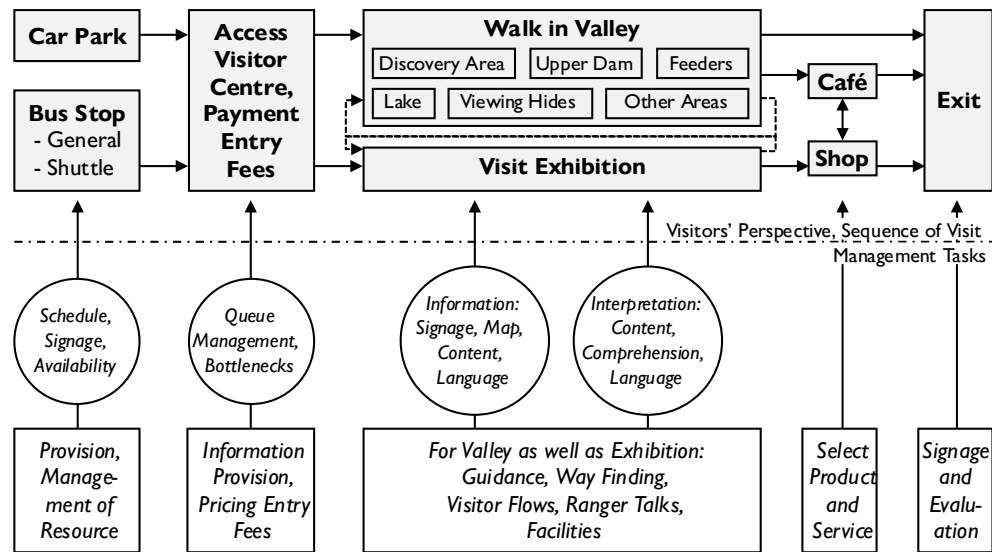
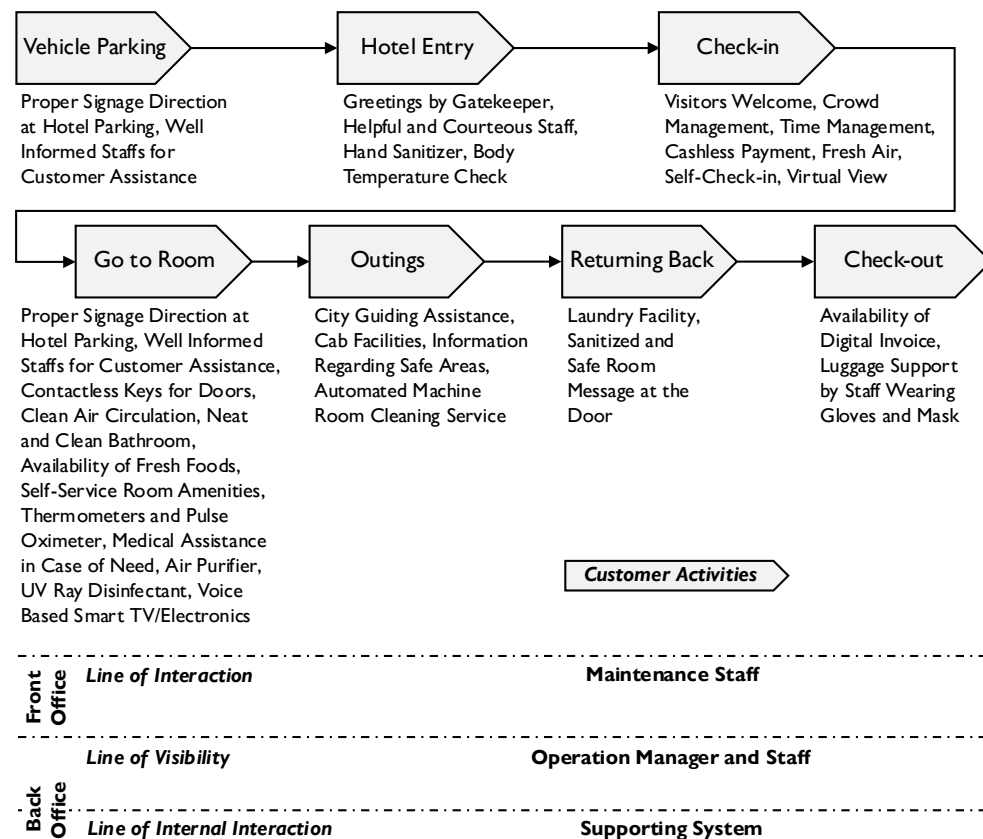


Figure 70: Service blueprint for (post-pandemic) hotels (Pandey & Kulshrestha, 2021, p. 617)



4.2.4 Business and customer processes

This last subsection compiles processes in tourism and hospitality and provides technological solutions to make them more efficient and effective. In the following, a large collection of processes is presented without further comments (Figure 71 to Figure 76 and Table 10 to Table 16). Some of them are structured along service procedures like, e.g., the guest cycle with assessment, pre-arrival, arrival, stay, departure, assessment, etc. (Lukanova & Ilieva, 2019, p. 160). Others are sorted by problems to be solved or expectation to be fulfilled. Often, certain technologies like, e.g., NFC of smartphones can solve many issues such as mobile payment, information supply, access authorization, loyalty programs, mobile ticketing, workforce management, location-based services, etc. (Egger, 2013, p. 122). At the same time, certain operational issues can be solved with many different solutions. Room access can for example be managed with the help of keys, RFID, Bluetooth, SMS, pin codes, barcodes, or biometrics (Lukanova & Ilieva, 2019, p. 166).

Figure 71: Process diagram of a hotel-resort (Suárez-Barraza, 2020, p. 169)

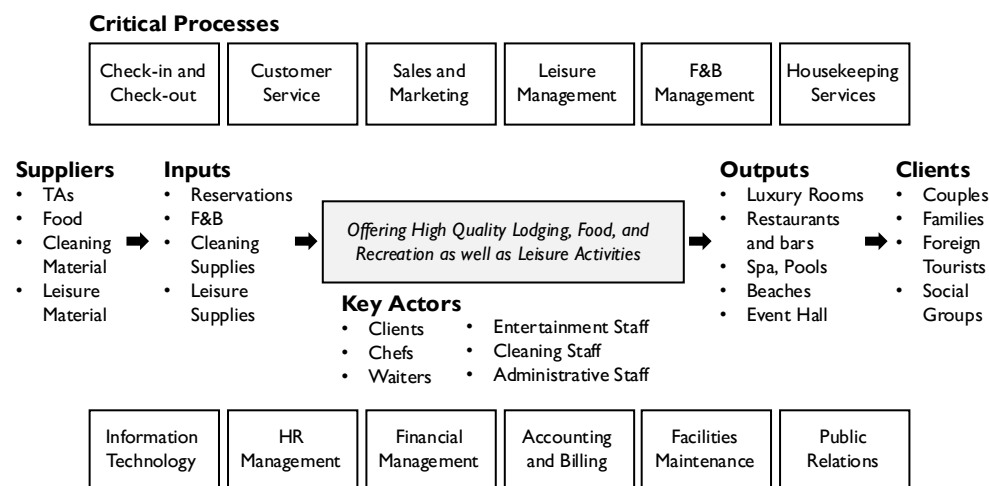


Figure 72: Front desk technology operations framework (Shin et al., 2019, p. 314)

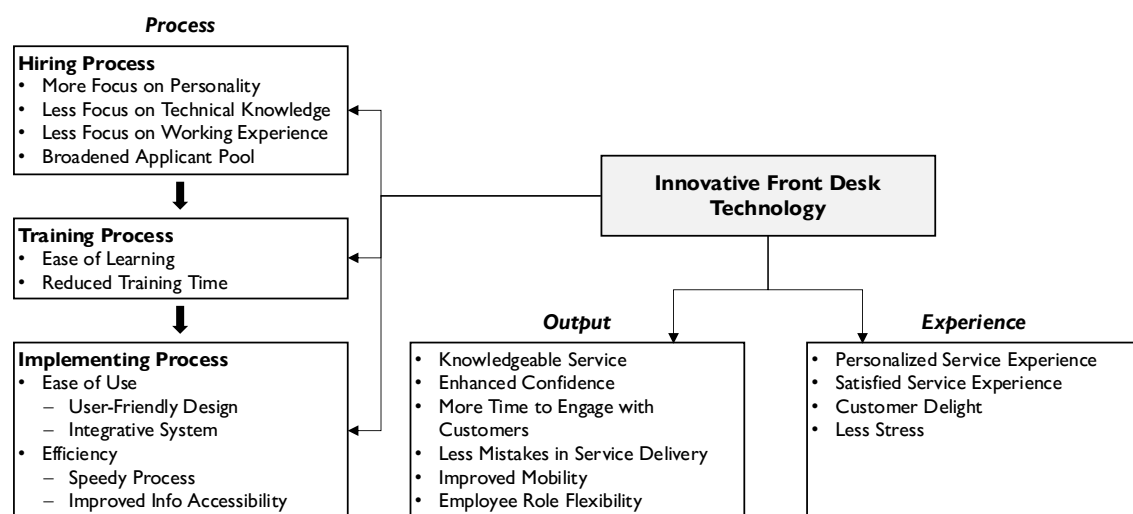


Figure 73: Service procedure of mobile catering (Chung et al., 2021, p. 17)

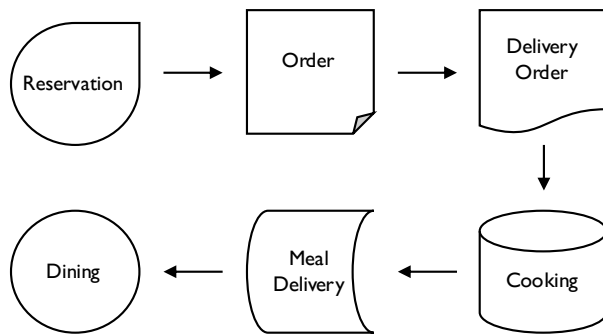


Figure 74: Technologies in the dining experience cycle (Leung & Loo, 2020, p. 59)

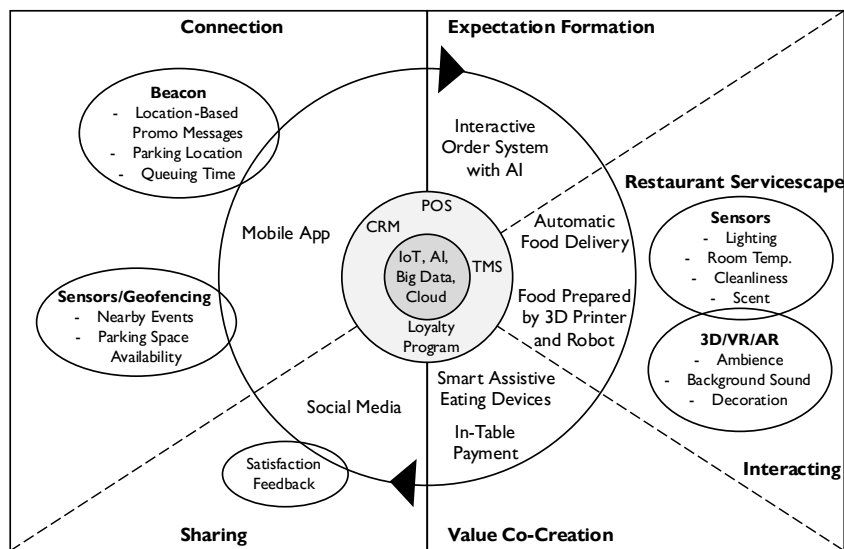


Table 10: Robots, AI, and automation in the guest cycle (Lukanova & Ilieva, 2019, p. 161)

Component	Pre-arrival	Arrival	Stay	Departure	Assessment
Robots		- Porter robots	- Front desk robots - Concierge robots - Delivery robots - Cleaning robots - Room assistant robots	- Porter robots	
Artificial intelligence	- AI search platform - Chatbots		- Interactive social hubs - Chatbots	- Travel assistant	- AI platform
Service automation	- VR - Mobile check-in	- Digital kiosks - Smartphone room - Non-stop check-in	- In-room smart technologies	- Express checkout	- Digital kiosks

Table 11: Chatbot capabilities in the guest cycle (Berezina et al., 2019, p. 187)

Component	Pre-arrival	Stay	Post-dining
Chatbots	- Make a reservation - Provide store information - Offer directions - Place a to-go/delivery order	- Provide menu item information - Place an order - Suggestive selling - Entertainment - Processing payment	- Assign loyalty points - Send personalized offers

Table 12: Scenarios with smart technology experiences (Neuhofer et al., 2015, p. 249)

Scenario	Welcome encounter	Room comfort	Restaurant visit
Smart technology	- Individualized welcome by guest name - Welcomed by familiar faces already introduced online prior to the guest's arrival	- Individualized room settings to personal preferences prior to the arrival - Dynamic update of preferences during the stay - Dynamic update of observations by employees	- Personalized welcome and greeting by name - Personal food and beverage preferences are known - Dynamic update of preferences and favorite consumption in food and beverage outlets during the stay

Table 13: Smart applications for the dining experience (Leung & Loo, 2020, p. 61)

Component	Pre-dining	During dining	Post-dining
Connect and expectation formation	- Social media - Mobile app - Location-based push message; geofencing		- CRM - Tracking app
Interaction and value creation	- Queue management - Translation - Voice ordering - AI recommender system - Holographic/gamification - Ambient and sensory control	- Automatic food delivery - Drone photo capture - Robot service - 3D printer - Eating assistance - Ambient control - Video projection	- Online payment at table - Food wastage monitoring
Sharing	- Social media	- Social media	- Review sites - CRM - Tracking app

Table 14: AI and robotics in restaurants (based on Blöcher & Alt, 2020, pp. 532, 535)

Business process	Subprocesses	Possible applications of AI and robotics
Customer operations	Customer information, customer service incl. complain management, order taking, consulting/selling, serving, payment, online delivery management, capacity, and queue management	- Service robots and robotic waiter systems - Object detection on images for automated checkout systems - Operation scheduling - Delivery robots - Chatbots and voice-activated technology for ordering, payment, info
Reservation	Reservation retrieval, table yield management	- Chatbots for reservation retrieval - Data-driven table planning
Marketing	Segmentation, campaign and promotion planning, design, campaign execution (across channels, e.g. social media, email, etc.), menu design	- Logistic regression modelling for marketing campaign effectiveness - Automated marketing promotion via chatbot, voice assistant, kiosks - Customer segmentation
Reputation management	Review management (search and reply)	- Reputation management - Sentiment analyses of restaurant reviews
Human resource management	Recruiting, staff planning and scheduling, staff training and development, incident management	- Recruitment processes - Planning algorithms for shift scheduling for human and robot tasks - Automatic labor planning - Time tracking using biometrics
Food and beverage preparation	Recipe creation and menu planning, cooking and drinks, kitchen device management	- Analysis and development of recipes based on data - Liquid handling control for service robots - Cooking robots - Beverage management - Kitchen operation
Supply chain management	Procurement planning, distributor price negotiation, order/procurement management incl. administration, inventory management incl. planning, controlling and food waste management, quality, hygiene and food security control	- Smart fridges at restaurants for automated food ordering - Better inventory management and planning with time series analyses
Management: business and finance	Business strategy, forecasting and budget planning, accounting, controlling, and reporting	- Demand forecasting - Demand prediction and production planning - Sales forecasting and revenue management

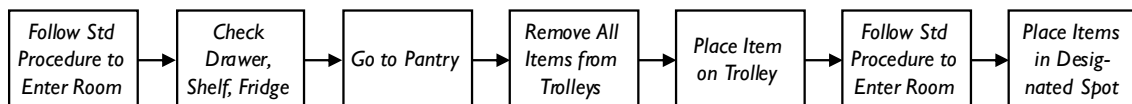
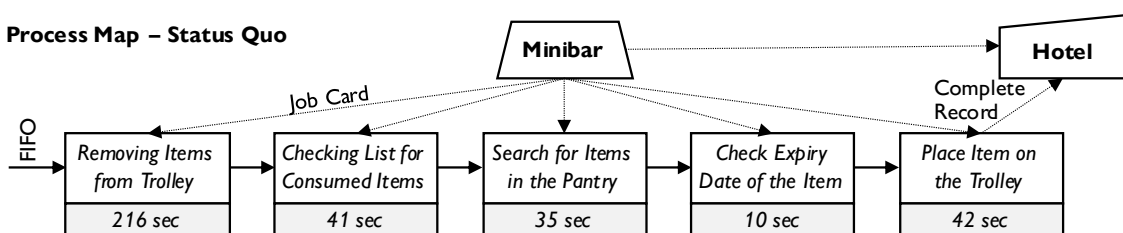
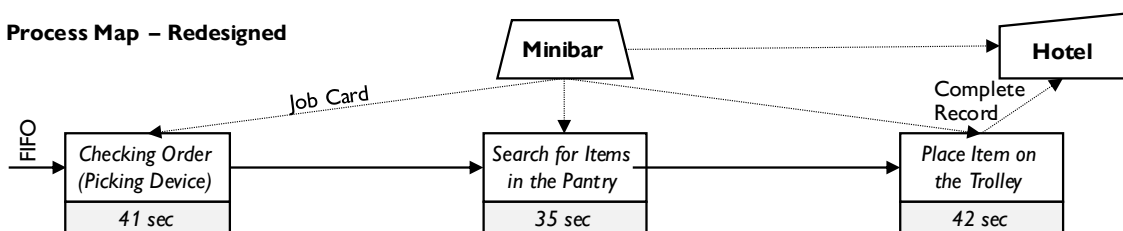
Table 15: ICT components in operational domains of hotels (Sirirak et al., 2011, p. 38)

Operations domain	ICT applications
Room division	- Telephone and fax systems - Web site and e-mail systems - Global distribution system - Check-in/check-out system - Central reservation system - Room status and housekeeping management - Customer database system and account management - Statistics and report system
Food and beverages	- Electronic point of sale system - Stock and inventory systems - Conference and banqueting system - Menu management system - Table reservation system - Order entry systems
Back office	- Human resource management system - Purchasing system - Financial and accounting systems - Sales and catering system - Generating report and update statistics system - Management support system - Decision support system - Customer relationship management system - Wireless internet connection area - Security system - Business center, Teleconference system - ATM in hotel
In-room	- In-room telephone system - Electronic locking system - Energy management systems - Automated wake-up system - Voice mail system - In-room internet access line/wireless - In-room entertainment system - In-room electronic safety boxes

Table 16: Personalized services for tourists (Buhalis & Amaranggana, 2015, p. 385)

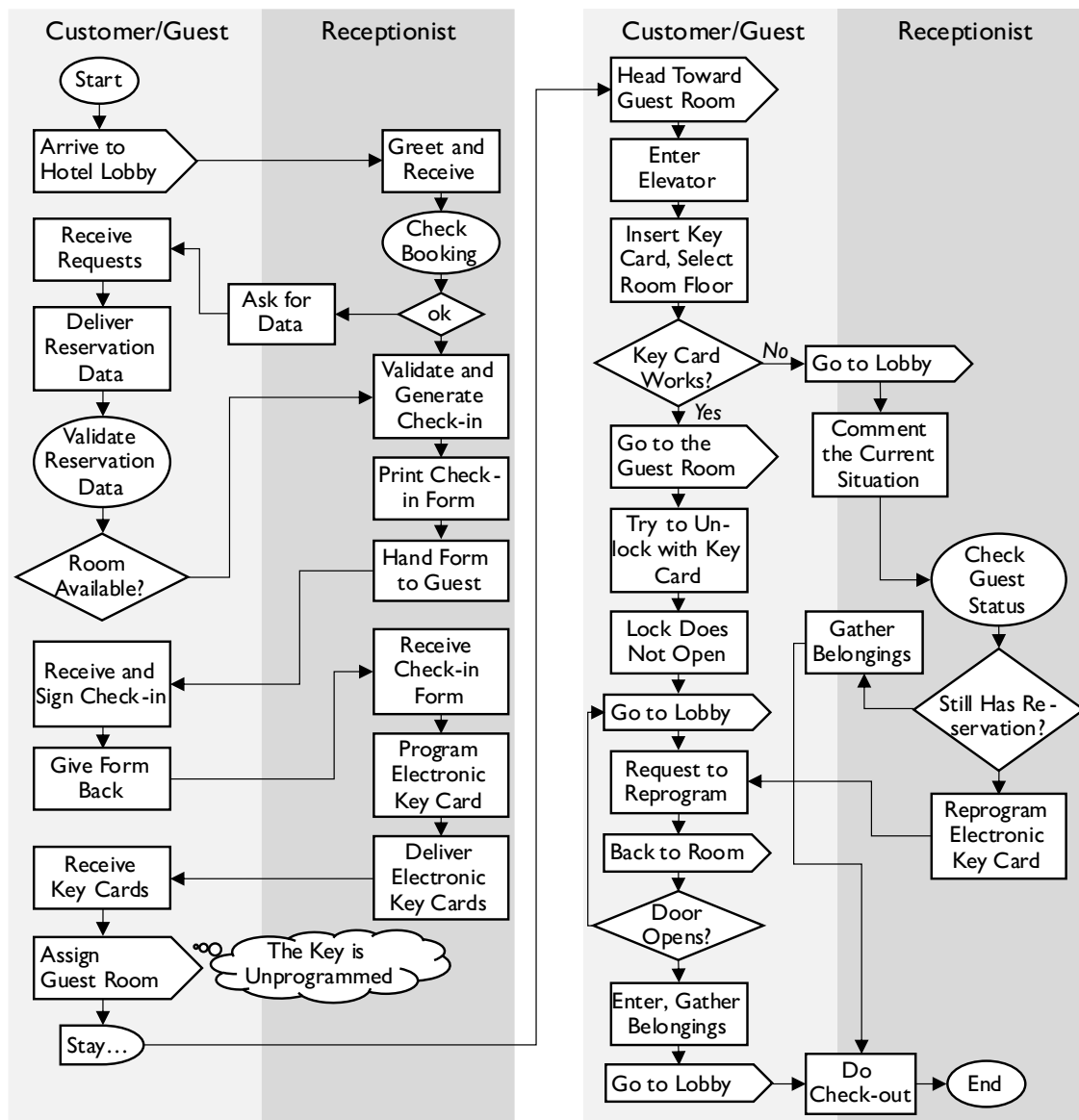
Component	Before	During	After
Transportation	- Planning: navigation and information (duration, types of transportation, schedule and fare) - Recommender system: trail package offerings	- Real-time schedule - Personalized greetings - Personalized meals - Suggest alternative - Universal card	- Feedback loop - Promotional update - Luggage finder
Accommodation	- Planning: navigation and information (location, reviews, room type, price and surrounding events) - Time savings: booking and check-in - Personalized welcome message	- Personalized welcome message - Awareness on customer preference - Personalized customer service - Room control over customer services	- Feedback - Promotional offers - Maintaining engagement - Post customer service
Gastronomical	- Information (special dietary, variety of meals, navigation, food ingredients and restaurant information)	- Integration service - Real-time information: customer awareness and social context	- Promotion - Prolong engagement
Attraction	- Recommender system - Information provider	- Co-creation through digital maps - Real-time information - Information on surrounding events	- Sharing platform - Prolong experience - News update - Recommender system
Ancillaries		- Navigation - General information - Instantly exchanging information	

Figure 75: Process redesign of minibar management (Ramadan et al., 2022, pp. 5, 10, 16)

Standard Procedure of a Minibar Department**Process Map – Status Quo****Process Map – Redesigned**

Based on process maps, operational inefficiencies can be identified and resolved. This can be done by purely organizational measures, but often involves technological mediation in all kinds of business processes of travel, tourism and hospitality. Ottenbacher and Harrington (2009, pp. 533-534) mention the example of quick service restaurants, where in some cases, the average production time just takes 35 seconds – thanks to new cooking equipment as well as purchasing and delivery processes (e.g., with the help of self-service kiosks).

Figure 76: Flow chart of magnetic key management (Suárez-Barraza, 2020, p. 171)



4.3 Technological solutions and applications

While most of the academic literature remains rather conceptual, there are some sources that include technological solutions that are readily available. In this last section, excerpts from literature on existing technology-based solutions for transport, tourism and hospitality are briefly presented. However, a more extensive range of applications is explored in the subsequent part (6.1) of this report, which builds on a practice review.

Historically, technology has been a key driver in the development of tourism. Hjalager (2013) collected a list of 100 innovations that either improved the social and physical efficacy, increased the productivity and efficacy in tourism enterprises (by restructuring the input factors such as energy, labor, capital, and land), or enhanced mobility to and within destinations. Regarding productivity, the author lists the following innovations in chronological order by date of invention or market introduction: barometer, thermometer, travelers' check, ocean liner, bus, railway, sleeping car, telegraph, weather service, elevator, Suez canal, electric street light, automobile, telephone, restaurant car, glass fiber, discount coupon, escalator, zeppelin, air conditioning, passenger aircraft, instant food, air traffic association, highway, air hostess, shopping cart, credit card, computer reservation system, microwave oven, electric sauna stove, minibus, snow cannon, kettle grill, solar cells, shopping mall, automatic door, dry ski slope, inflatable life raft, barcode, pool-cleaning robot, computer tablet, loyalty program, RFID, sous-vide, mini-bar, airline deregulation, mobile phone, rolling luggage, robotic lawn mower, world-wide web, E-ticketing, QR code, social media, Euro, GPS, genetically modified golf turf, micro-blogging, body scanning, artificial weather, and avatars (Hjalager, 2013, pp. 7-8). Hjalager (2013, p. 18) states that in about 60% of the collected cases, "the innovations had an impact on the operations, productivity, and use of resources in the tourism enterprises", with recent changes in ICT benefitting tourists and changing communications both inside and outside the companies. Reinhold et al. (2020) focus on the last 30 years and the impact of ICT with the emergence of E-business-models in tourism. The authors structure the period and its milestones in three phases: the dynamic early years (1993–2000) with "commerce type" platforms such as Expedia and Booking, the social years (2001–2008) with "content type" platforms such as TripAdvisor or TravelBlog, and the platform years (2009–2019) with businesses such as Airbnb and GoogleTravel (Reinhold et al., 2020, pp. 8, 20).

Beritelli and Bieger (2022) discuss smart services in tourism and refer to available technological solutions in the industry (as mapped by an interest group for tourism in the Swiss region of Grisons). Some authors focus on specific technologies such as voice assistants or NFC (Egger, 2013, p. 122) and their application in tourism. Öztayşi et al. (2009, p. 622) collect examples of RFID applications in tourism, which include access control systems, payment systems, tracking systems, kiosk and information management, as well as preference capturing. RFID cannot just provide information in museums or shopping malls but also serve for human and assets tracking and control as well as contactless payment (Öztayşi et al., 2009, p. 620). Others emphasize different types of existing value creation and exemplify it by providing industry cases and facilitating technologies (Neuhofer, 2016, p. 29). Brioschi et al. (2021) present an API-based digital ecosystem for smart destinations. The Cefriel ecosystem toolkit has been implemented in the Italian region Lombardy for the world expo in Milan in 2015 and includes more than 170 APIs today. Buhalis et al. (2022) investigate smart technology applications in the cruising industry. They collect extensive lists of digital apps for customers from all major cruising companies such as Royal Caribbean, Norwegian, and MSC and describe their functionalities.

Table 17: Digital solutions for guests of cruise operators (Buhalis et al., 2022, p. 638)

Company	Ship Class	Technology Applications
Royal Caribbean Cruise Lines (RCCL)	Quantum Class Ships	Voom, Wifi Connection at Sea GPS Mapping and Bluetooth for Navigation On-Board Facial Recognition Technology Excalibur App Sea Beyond App to Help Customers Prioritize their Activities WOW Electronic Bracelets using RFID Technology Star Trek Looking Digital Boards for Monitoring the Engine VR Dining AR for Steering the Ship in Low Visibility Virtual Balconies using HD LED Screens RipCard, Virtual Skydiving Simulators SkyPad, VR Bungee Trampoline Laser Tag Battle for Planet Z Bionic Bar with Two Robotic Bartenders iQ App which Integrates Customers' On-Board Experience Cruise Planner App, a Tool that Helps Pre-Plan the Vacation Wayfinder Interactive LCD Touch-Screen using RealMotion Technology VR Mini-Gold X-Ray Vision App GoBe Interactive Platform Offering Virtual Shore Excursions, Tours and Activities Two70° Digitally Transformable Public Venues Using Roboscreens ARKit and ARCore Games to Make Better Use of Ship Space
	Regent Seven Seas Cruises	CRM System to Track and Record Guest Preferences Magic Carpet, a Floating Platform which Changes Mood, Function, and its Location
	Celebrity Cruises	Eden Space, a Multi-Purpose Space whose Design is Based on a Maths Equation Interactive Menus on iPads in Qsine Restaurant Edge Access Tour App, a Behind-the-Scenes 3D-Tour Using AR Luxury Smart Glass Shower Using Electro Chromatic Tech Digital Backdrops in Lieu of Elaborate Sets
Carnival Cruise Line Group (CCL)	Carnival Cruise Line	EA Sport Bar Using iPads Crew Compass
	Princess Cruises	MedallionNet, Wifi Connection at Sea Ocean Medallion Ocean Compass, a Schedule of Board Activities Ocean Ready to Submit Travel Documents and Go Paper Free Play Ocean, Mobile Video Games that Can be Played On or Off the Ship Ocean Concierge for Purchasing Shore Excursions and Viewing Accounts Ocean View App with Ocean Original Episodes with Experiential Content Ocean Now for Personalized Guest Service on Demand Ocean Casino App
	Holland America	Microsoft Business Intelligence Software Oracle Business Intelligence Software
	AIDA / COSTA	Pepper, Robot Which Recognizes Human Emotions and Interacts
	Cunard Seabourn	Cunard ConneXions, Educational and Entertainment Daily Programme
Genting Group	Crystal Cruises	In-Room Tablets, Mobile App
Norwegian Cruise Lines (NCL)	Norwegian Cruise Line	App Allowing Passengers to Check in and Make Purchases Before Embarkation Virtual Game with Virtual Ocean Views in Window-Size for Interior Rooms Virtual Mini-Gold Epic App, an iConcierge for Connecting Guests and Crew Facial Recognition for Matching Guests to Photos Captured on Board Interactive Touchscreens for Navigating and Booking Activities Interactive Digital Signage on Board
The Walt Disney Company	Disney Cruise Line	Magical Porthole Showing Disney Animated Characters Together With Live Ocean View Animation Magic Shop MyMagic+ Technology Project MagicBand No.2 for Additional Interactivity MyDisney Experience App Magic PlayFloor, Interactive Floor with Gaming Technology and Disney-Style Storytelling MagicBand Bracelets to Connect Cabin Keys, Payments, PhotoPass with RFID, BLE, NFC Skyline Bar with Virtual Windows on the Bar's Walls to Recreate Realistic Skyline Views Two Phones for Free in Each Stateroom for Internal Communication
Mediterranean Shipping Company (MSC)	MSC Cruises	MSC for Me App with 130 Different Technological Functions MSC Meraviglia with 114 Interactive Screens for Booking Activities On-Board MSC for Me Bracelets with RFID, Waterproof with ID Functionality MSC for Me Touchpoints Interactive Maps to Guide Guests Around the Ship Interactive Game Shops, Touch Screens and 3D-Printers for Children

Ivanova (2019) focuses on currently applied technologies in travel agencies and aggregates an overview of front- and back-office operations.

Table 18: Applied technologies in travel agencies (Ivanova, 2019, p. 225)

Front Office Operations Technologies	Tourist Behavior Activities	Back Office Operations Technologies
Website Automation XML Links to Suppliers, White Labels, Chatbots Virtual Reality Meta-Search Aggregators Own Aggregator Platforms (TMC) Dynamic Packaging Software Digital Concierge Booking Engine Booking-as-a-Service Software Payment Transactions Applications Document Issuance Software Personalized Intelligent Solutions Mobile Applications Virtual Personal Assistant Software QR Codes Virtual Guide in Museums/Attractions Augmented Reality Self-Service Kiosks Mobile Applications for Feedback	Pre-Consumption Activities Choice of Destination Information about the Destination Selection of Particular Services (Flights, etc.) Booking Process Payment Documents of the Trip Activities During the Trip Navigation Selecting Miscellaneous Services on the Spot Information within the Destination Post-Trip Activities Sharing Experience Feedback Surveys	Management of Information Software Integration of all Suppliers CRS Data Development of Huge Databases Inventory Management Software Intelligent Retargeting and Bid-Management Tracking Software User Profiling Data Management Platforms Targeting and Marketing Campaigns

Laesser et al. (2018) present technological solutions for travel and tourism along the value chain, which includes both customer-facing and back-office processes. Based on an updated analysis of the authors (Laesser et al., 2021, pp. 75-80) it becomes apparent that many of the actually available solutions (often startups or industry initiatives) are facilitating marketing tasks such as promotion, distribution, CRM, pricing, information aggregation and distribution. However, only a minority of projects provides digital support for any of the other business processes such as sourcing, HR development, financing, logistics, etc. (Laesser et al., 2021, p. 89).

Table 19: Overview of important IT system types in tourism (Laesser et al., 2018, p. 131)

Supply/Purchasing	Planning and Product/Service Delivery	Marketing and Distribution
ERP and Purchasing Systems	<i>Airlines:</i> Airline Systems at Airports <i>Airports:</i> Baggage Logistics of Airport <i>Airports:</i> Change/Transfer/Transition Systems <i>Airports:</i> Disposition/Planning Systems <i>Hotels:</i> Hotel Management Systems <i>Hotels:</i> Access Systems <i>Hotels:</i> Pay-TV, Minibar, Room Temperature, etc. <i>Destinations:</i> Destination Management Systems Wifi for Guests and Employees Internet/Extranet/Collaboration Tools ERP Systems Yield, Revenue and Cost Optimization Systems	Own Website / App - Content Management System - Booking Apps on Web Sites - Web Shop Systems (e.g. Vouchers) - Chatbots, Internet Payment Systems Distribution System - Central Reservation System - External Distribution System (OTA, etc.) Customer Relationship Management (Systems) - Loyalty Program - Newsletter System Social Media Systems - Social Networks - Review Portals
Support Processes: Cashier Systems, Accounting Systems, Treasury Management, Controlling, Online Booking; Recruiting Systems, HRM Systems		

5 Literature review conclusion

This report delivers an overview of the existing literature on current approaches to service design, business processes, and business models in the travel, tourism, and hospitality domain. It provides the academic foundation for subsequent, more practice-oriented work on actual solutions to make the sector more resilient. This literature review represents the initial work package of a subproject that is part of the national flagship project “Resilient Tourism” which is conducted in close collaboration with academia and practice.

The report is based on a comprehensive review of literature in the field of contemporary travel and hospitality, sometimes conceptualized as tourism 4.0 or smart tourism. This includes topics such as technology-based innovation of processes to improve productivity as well as data-driven service re-design to increase value creation of business models. Despite being methodologically rigorous, the review does not just include peer-reviewed papers, but also practice-oriented literature with inspirational potential for creative tasks in subsequent work packages.

The review includes 230 sources, most of which have been published during the last ten years. Due to the breadth of the included topics, the selection of literature comprises several independent communities of authors, with 50 of them appearing more than once in the review. All the sources have been coded manually which led to the creation of more than 1900 keywords. By focusing the content analysis on keywords with more than three co-occurrences across the 230 sources, a total of 180 terms remained for detailed inspection.

The thematic investigation was done in two ways. First, an algorithmic cluster analysis provided four (slightly) distinguishable themes by combining co-occurring keywords: productively co-created experiences, smartly personalized applications, networked platform solutions, and data-based business ecosystems. Secondly, a manual keyword sorting procedure resulted in ten topics that comprise 18 of the 180 keywords each: hardware, software, solutions, services, features, capabilities, collaboration, concepts, economics, and issues.

Furthermore, the analytic part of the review is complemented by an extensive collection of visual and tabular excerpts from the 230 papers and books. These have been sorted into system- and process-based approaches to the wider topic of smart tourism. The system perspective includes conceptualizations of smart tourism destinations, tourism ecosystems and networks, as well as technological systems and attributes. The process perspective provides frameworks on topics such as innovation and competitiveness, business models and service blueprints, as well as business and customer processes that can be enhanced or transformed by technology.

This part of the report is concluded by a selection of identified, readily available (primarily digital and technology-based) solutions for travel and tourism. However, as academia seems lagging behind industry practice, further investigations beyond pure literature research are necessary. It is important to gather insights into current applications and practices regarding service and business design by mapping service blueprints and business processes in close collaboration with industry practitioners. Based on this, best practices and opportunities for innovation and digitization can be explored, disseminated, and exploited.

6 Practice review methodology

In the past decade, many actors along the tourism service chain have seen their traditional ways of doing business being challenged by a combination of factors. These include regulation, changing tourist behavior, technological progress, new forms of competition across traditional industry boundaries, and more (Reinhold et al., 2017). Thus, actors in the tourism and hospitality sector are forced to update and change how they create, capture, and disseminate value in the digital age.

While the literature review in the first part of this report started with theory, the following review adopts an exploratory approach to business processes and models. It focuses on practical applications which drive the (digital) business ecosystem of tourism and hospitality today. While Switzerland is the main context of application, the report also includes international examples.

6.1 Approaching the system landscape

The compilation of this review is based on the exploration of a wide range of sources, with the aim of including the most relevant elements of the (digital) landscape in (Swiss) tourism and hospitality. It is based on both desk research as well as expert interviews and further input from practice. Sources and starting points for exploration include:

- **Swiss industry reports** on digitization in tourism and transport from academia (such as Laesser et al., 2021; Laesser & Kuster, 2023; Laesser et al., 2018)
- **Regional inventories** on digital tools in tourism from all over Switzerland (such as Gollier et al., 2023; Interessengemeinschaft Tourismus Graubünden, 2021; Schegg, 2023)
- **Expert input** from local practitioners in the field of tourism and hospitality (such as Thomann Hospitality Management AG, ComCierge GmbH, Axeba AG)
- **Further resources** to ensure parity with other markets internationally, with industry specific platforms like Skift.com and HotelTechReport.com as well as generic IT benchmark platforms such as Capterra.com and SoftwareAdvice.com

When mapping systems of an entire industry, different perspectives can be adopted. This report puts an emphasis on (potentially) digitized processes. This process-view is augmented by adding a business model layer. Furthermore, firms can form a distinct business ecosystem within the wider industry of tourism and hospitality. The review is therefore structured in three levels:

- **Micro (6.2):** On this level, the emphasis lies on specific process steps and process chains. Relevant frameworks include the customer buying cycle as well as service blueprints that represent typical customer processes of tourists.
- **Meso (6.3):** This level focuses on business models and business model patterns, which are essentially built on value creation processes (cf. micro-level). Relevant frameworks include business model typologies as well as business model canvases.
- **Macro (6.4):** Several businesses (and other actors) can form a network, centered around specific customer needs or processes, thereby creating a business ecosystem. This system view includes a range of partners that facilitate the tourist experience in a destination.

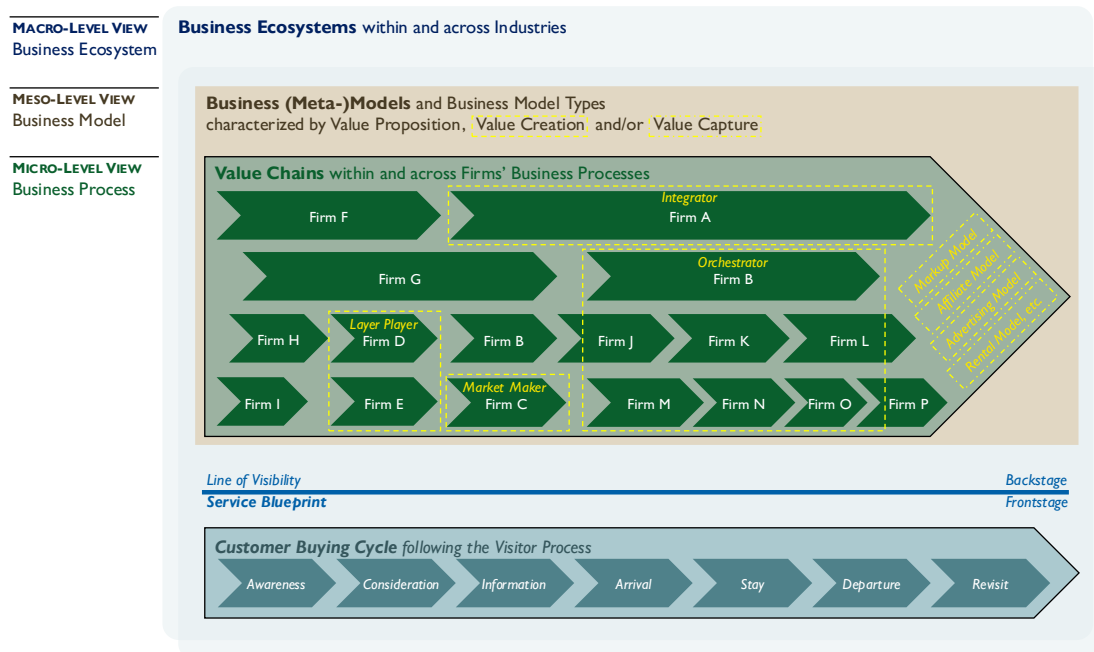
The following visualization (Figure 77) contains the conceptual framework of this practice review. It combines the three levels (micro, meso, macro) and contains the key concepts with their main components:

- **Business ecosystems**, spanning across traditional industry boundaries, partly going beyond tourism and hospitality (e.g., online, energy, city, and other systems).
- **Business models**, reflecting distinct configurations of value creation, dissemination, and capture (e.g., meta-models like integrator, orchestrator, layer player, or market maker).
- **Business processes**, forming value chains within and across specific firms, enabling a smooth visitor process or customer buying cycle (from awareness to repurchase).

While these perspectives can be separated analytically, they are often intertwined in practice. In other words: the different frameworks often present a different side of the same medal. Business processes are the (internal) counterpart that (ideally) follow a customer's buying cycle. Business models are normally characterized by a specific type of value creation. And business ecosystems are usually centered around specific customer needs, which – in this context – will be part of a tourist's visitor process.

Figure 77: Conceptual framework for this practice review

Mapping the (technological) system landscape in Swiss tourism and hospitality



In the subsequent sections, these concepts are introduced in detail, starting with the micro-level (process-view). Afterwards, empirical collections of the most relevant configurations across all three levels are presented. Furthermore, these conceptualizations provide the basis for future, more conceptual work within this project and report.

6.2 Micro level – business processes

On the micro level, tourism and hospitality are based on a vast number of process steps. Ideally, these processes are aligned within and across firms to provide seamless customer experiences. This is relevant for services in general and for the fragmented tourism sector specifically. In the following subsections, relevant frameworks for the analysis and design of business and customer processes are presented, including customer journey, service blueprint, and value chain.

6.2.1 Customer journey

Since the 1990s, the concept of the customer journey has found widespread adoption across (service) industries (Tueanrat et al., 2021). It is highly relevant for service management and service design regarding customer experience (Følstad & Kvale, 2018). In the age of digitization, the set-up of effective customer journeys has become an important topic as it is considered as a key source of customer value (Kuehnl et al., 2019).

Customer journeys can consist of a series of interactions on a specific website, but can also encompass various touchpoints, channels, and service providers (Følstad & Kvale, 2018, p. 208). While there is no standard definition of a touchpoint, literature typically describes them as elements that (in combination) form a customer journey, by providing moments or interfaces of interaction between provider and customer (Følstad & Kvale, 2018, p. 209; Tueanrat et al., 2021, p. 340).

Typically, customer journeys are structured in phases. In a most basic structuration, these customer processes can be split into pre-purchase, purchase, and post-purchase phase (e.g., Tueanrat et al., 2021, p. 347). However, there are also more granular as well as industry-specific conceptualizations (e.g., Følstad & Kvale, 2018, p. 205). These variants often differentiate seven or even more stages in the customer journey (see Hamilton et al., 2020, p. 70). The following table contains an exemplary version of a customer journey in tourism and hospitality.

Table 20: Customer journey in tourism and hospitality (based on Hamilton et al., 2020, p. 70)

Step	Type of activity	Explanation of stage in customer journey
1	Awareness	Customer becomes aware of a specific need or destination.
2	Consideration	Customer starts considering the specific travel option or destination.
3	Information (Booking)	Customer engages in specific trip planning, including purchasing (where possible/necessary).
4	Arrival	Customer travels to the selected destination(s).
5	Stay	Customer spends time in destination, possibly conducting various activities (and additional purchases).
6	Departure	Customer leaves the selected destination(s).
7	Revisit	Customer rebooks services and/or revisits destination(s).

In practice, customer journeys can be highly complex and non-linear. The example of tourism shows that (apart from all-inclusive trips) customer journeys involve various purchases, which can be embedded in over-arching visitor processes. Furthermore, it becomes clear that customer journeys (ideally) do not end with the departure of a tourist, but with an intention to revisit or repurchase. Therefore, the customer journey is sometimes also referred to as customer buying cycle or guest cycle (e.g., Sann & Lai, 2020). In this report, customer journey, customer buying cycle as well as guest cycle, visitor process, and customer process are understood synonymously.

6.2.2 Service blueprints

The concept of the customer journey is adopting a client view of a service or service chain. It can be helpful to identify critical touchpoints from a customer perspective and improve service satisfaction (Tueanrat et al., 2021, p. 340). However, the elimination of (potential) failures in the customer buying cycle are reflected by adjustments on the side of a firm's processes. Every stage in the customer journey is met with corresponding business processes of a firm, such as offering design, lead generation, booking processing, (pre-)arrival services, activities during the stay, and (post-)departure services.

To complement the client-centric view of the customer journey, theory and practice resort to the concept of service blueprints (Tueanrat et al., 2021, p. 336). A service blueprint cannot just include the client, but also the corporate view. The idea dates back to the 1980s and is based on the idea of process charts (Shostack, 1982, p. 56). A blueprint is a visual representation of backstage actions such as (invisible) support processes as well as (visible) frontstage service elements that are directly tangible for the customer (Følstad & Kvale, 2018, p. 199).

Table 21: Components of a service blueprint in hospitality (Bitner et al., 2008, pp. 73, 76-77)

Type of activity	Layers	Example of the check-in stage of a visitor process
Support processes		Registration system
	← Line of internal interaction	
Employee actions (invisible)		Updating customer profile
	← Line of visibility	
Employee actions (visible)		Handing out keys
	← Line of interaction	
Customer actions		Check-in
Physical evidence		Welcome desk and lobby

A blueprint is typically structured by different lines (see Bitner et al., 2008): The visible part of the service experience, where customers directly interact with employees, interfaces, and touchpoints, is happening in front of the line of visibility (frontstage). Support processes as well as invisible employee actions are placed behind the scenes (backstage). On the rear end, behind the internal line of interaction, there are various support processes and systems that support operations. On the front end, there are the customers with their actions, manifesting in a physical (or virtual) world. A complete service blueprint combines relevant elements from all layers and adds a time or process perspective by placing arrows between building blocks of a service experience (for a hospitality example, see Bitner et al., 2008, pp. 76-77).

Service blueprinting is a method specifically designed for analyzing, visualizing, and optimizing service processes within (and across) organizations. The term blueprint refers to its historical association with architectural drawings, which were initially used to visualize processes and customer activities (Shostack, 1984). By including both firm and customer activities, the service blueprint spans the boundary between the client-centric approach of the customer journey (see Table 20), and the firm-centric approach of the value chain framework (see Table 22). The line of interaction is like a mirror: Customer actions are (ideally) reflected by corresponding firm actions.

6.2.3 Value chain

The concept of the value chain emerged in the 1980s, too (Porter, 1985). In its original conception, the framework was focused on the firm level, by mapping the primary and support activities of a specific company. In this view, the configuration of processes can explain competitive advantages (and margins) of companies from all industries (Porter, 1985).

As value is usually created across various companies, the value chain was soon expanded beyond firm and national boundaries (Sturgeon, 2001). Today, the value chain framework is applied for analyses of specific firms, but also entire industries, which are often spanning the world in so-called global value chains (Zamora, 2016, p. 117). Due to their focus on firm and industry processes, value chains are highly related to the concept of supply chains (Mills et al., 2004, p. 1023). However, the value chain framework goes beyond pure material flow and includes services as well as many more processes.

Table 22: Value chain of a hospitality firm (based on Porter, 1985, p. 37)

Type of activity	Process step	Element of the chain	Explanation of element
Support activities	ongoing	Firm infrastructure	Support infrastructure for business operations
	ongoing	Technology development	Implementation of e.g., IT and automation
	ongoing	Human resources	Acquisition and training of employees
	ongoing	Procurement	Purchase of required goods and services
Primary activities	1	Inbound logistics	Inventory management and resource planning
	2	Operations	Capacity planning and service scheduling
	3	Outbound logistics	Delivering the product or service to customers
	4	Marketing and sales	All marketing activities and CRM with e.g., loyalty programs
	5	Service	Customer service, including e.g., social media channels
Margin	result	Value created within the chain and	captured by the firm

The value chain framework is also applied in tourism research and management to investigate issues such as supply of products and services, design, sustainability, distribution, and policy across different actors (Song et al., 2012). Approaches in tourism typically adopt micro- or macro-economic perspectives: On the macroeconomic level, the emphasis lies on input and output linkages within production chains, which allows for measurements of regional or national effects of tourism (Romero & Tejada, 2011, p. 297). The fact that tourism is a phenomenon that relies on various sectors (real estate, financial services, energy, transportation, retail, etc.) makes an industry-level approach challenging (Romero & Tejada, 2011, p. 298). On the microeconomic level, the focus lies on activities within (global) value chains, reaching from product design through production to disposal, with each step adding value to the product (Romero & Tejada, 2011, p. 297).

The microeconomic approach to value chains is more relevant to this report, as it provides a complementary process view to the customer journey perspective. However, literature shows that a pure process view might not be sufficient to adequately explain competitive advantage in all situations. Some authors suggest more network-oriented perspectives (see, e.g., Stabell & Fjeldstad, 1998) while others add dimensions by looking at business models instead of business processes.

6.3 Meso level – business models

On the meso level, tourism and hospitality is based on a variety of business models or business model patterns. The following subsections provide the conceptual foundations for subsequent discussions of business models in the tourism sector. The multidimensional concept of the business model is relevant for both analysis and design of firms and industries.

6.3.1 Business model definitions

The business model characterizes a company by not just representing the value creation (cf. value chain) but including more dimensions. While a business model concept is generally seen as an understanding of the firm's logic for creating and commercializing value, the business process model primarily focuses on how a business case is implemented in processes (Gordijn et al., 2000). Literature shows that there is no uniform definition of what a business model is. However, in essence, it describes how a firm delivers value to its customers, entices customers to pay for said value and how those payments are converted into profit (Teece, 2010). A business model depicts the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities (Amit & Zott, 2001, p. 511). Frequently, the business model framework is employed as a conceptual tool for describing, analyzing and designing the business logic of a company (Osterwalder et al., 2005, pp. 17-18).

Since there are many different *business model frameworks* that illustrate the same concept, some authors suggest to talk about *meta-models* (Osterwalder et al., 2005). In its simplest form a business models entails information on how a firms creates and captures value (Teece, 2010). It thus consists of two elements. Literature shows, that there are certain constitutive elements, that are shared by almost all conceptualizations or meta-models (Zott et al., 2011): *value creation*, *value capture*, and *value proposition* of a firm. However, due to the internet and e-commerce, questions have been raised on how businesses deliver and capture value (Zott et al., 2011, p. 1025). Some authors add more dimensions, such as the target of the value creation, the customer segment(s) and/or further beneficiaries (Bieger & Reinhold, 2011; Gassmann et al., 2014; Taran et al., 2016). One of the most widely used business (meta-)model frameworks even consists of nine elements (Osterwalder et al., 2005, p. 18): *key partners*, *key activities*, *key resources*, *value propositions*, *customer relationships*, *customer segments*, *channels*, *cost structure*, and *revenue streams*.

Table 23: Business (meta-)models with two to nine elements

Dimensions	Elements (wording slightly unified)	Alternative terms	Source
	value creation	key activities; value configuration	see section 6.2.3 on value chain
2	+ value capture	revenue streams	Teece (2010)
3	+ value proposition	selling proposition	Zott et al. (2011)
4	+ value target	value dissemination; customer segments	Gassmann et al. (2014)
5	+ value network	value development; key partners	Taran et al. (2016)
6	+ value communication and transfer	channels	Bieger and Reinhold (2011)
9	+ key resources + customer relationships + cost structure		Osterwalder et al. (2005)

6.3.2 Business model types

While there are different conceptualizations of business models (so-called meta-models, see 6.3.1), there are also various classifications (taxonomies and typologies) of business models. *Taxonomies* are typically derived bottom-up from empirical research and observations of things out in the world, whereas *typologies* are derived top-down from conceptual work and theoretical sense-making (Baden-Fuller & Morgan, 2010; Hambrick, 1984; Reinhold et al., 2019, p. 1136). The breadth and depth of a classification is defined by its purpose. While narrower classifications might oversimplify, they are more efficient for comparing different models.

Business models can be classified by distinct combinations of their defining elements (e.g., unique value creation, value capture, and value proposition), sometimes referred to as business model patterns (see e.g., Gassmann et al., 2014). However, in their simplest form, classification schemes even focus on one dimension only: value creation or value capture (cf. Bieger & Reinhold, 2011; Johnson, 2010; McGrath, 2010). These can be used as basic patterns for design or as a reference point for analysis. In the following subsections, a typology based on value creation patterns (Heuskel, 1999; zu Knyphausen-Aufseß & Meinhardt, 2002) and a taxonomy based on value capture configuration (Teece, 2010) are introduced.

6.3.2.1 Business models based on value creation configuration

The activities of a company can be represented as a value chain, which is a linear sequence of input and output factors (see 6.2.3). Typically, the question for a firm arises as to which links in a value chain it should take over or to what extent value creation should be integrated. This is essentially a “make versus buy” decision.

There are four key types of business models based on distinct **value creation configurations** (Heuskel, 1999): Companies that focus on a link in the value chain across different value chains and/or industries, are called *layer players*. Companies that insource almost anything are referred to as *integrators*. Companies that buy the products and services from different firms to bundle and sell them under a unified brand or offering are known as *orchestrators*. Lastly, there are companies that create new markets or bring buyers and sellers together, which are known as *market makers*. In the following subsections, these four basic types are briefly introduced and discussed, with advantages and disadvantages.

Table 24: Typology of business models based on value creation configurations (based on zu Knyphausen-Aufseß & Meinhardt, 2002, p. 95)

Typology	Description	Examples in tourism and hospitality
Layer player	Firm acts as a specialist within many value chains, focusing on a specific step of the value-adding process	Providers of transportation services
Integrator	Firm acts as comprehensive provider of products and services along a value chain or customer journey	Integrated resort operators
Orchestrator	Firm acts as a coordinator that includes external products and services into a lean customer experience	Tour operators
Market maker	Firm acts as a central platform that matches supply and demand or various stages of the value chain	Platforms for holiday rentals

According to the **layer player** configuration, a company may choose to specialize by delivering a single value-adding stage for diverse added-value chains, operating as a specialist (Bieger et al., 2011). Specialization allows for economies of scale and learning. Layer Players often expand across industry boundaries (Heuskel, 1999). A call center could for instance provide services for different companies, such as acting as a complaints center for a food manufacturer or a booking center for a tour operator. Typical examples in this category include online travel agencies (OTAs) like Booking.com, specializing in accommodation mediation. Other examples with focus on a specific stage in the tourist value chain include Accor (hotels) or Avis (car rentals).

The business model of an **integrator** is characterized by the fact that the company performs a large part of the activities along a value chain itself. It has almost no external sourcing, and thus controls the value chain. Vertical integration can be carried out both forward or downstream and backward or upstream (Heuskel, 1999). Traditional companies in an industry often adopt this model. For instance, a tour operator running its own travel agencies, airline, and hotel chain can optimize a seamless experience and generate economies of scope (like, e.g., TUI). The company can save transaction costs by avoiding complex negotiations with suppliers and consumers. However, there's a risk of accepting cost disadvantages due to a lack of specialization (Bieger, 2019).

The business model of an **orchestrator** is characterized by the company focusing on essential core segments where it has a competitive advantage. The remaining services are purchased and coordinated by the company, thus controlling the entire value chain (Heuskel, 1999). For example, a cruise operator such as MSC may source transport capacities as well as activities as part of day-excursions from local providers. Orchestrators gain quality and cost advantages by purchasing from specialists but face risks, such as production interruptions if a key supplier drops out. Transaction costs also arise from contract negotiations with suppliers. Companies exemplifying the orchestral model meticulously coordinate and integrate diverse services to offer a comprehensive and harmonious experience (Bieger, 2019).

A company adopting the **market maker** concept restricts itself to combining various performance elements within a value-creation process. Market makers streamline information flow and reduce transaction costs for market partners, creating added value by facilitating communication and providing access to other value-creation processes (Heuskel, 1999). However, there is a risk of being bypassed, with customers turning directly to the supplier (Bieger, 2019). Prominent illustrations of this model in the tourism industry include Airbnb, functioning as a platform connecting private accommodations with travelers, and Uber, facilitating transportation services by connecting drivers with passengers.

6.3.2.2 Business models based on value capturing and other patterns

While early literature on business models was mostly focused on the value creation element, the attention of theory and practice has shifted towards the **value capture component** (Zott et al., 2011, p. 1037). Many of today's well-known business model patterns (see e.g., Gassmann et al., 2014) are essentially value capture models. The focus on value-capturing is justified by the fact that value creation, while necessary, is not sufficient for a sustainable business model. An example is Thomas Edison, whose inventions created value, but did not manage to capture the value creation (Teece, 2010, p. 186). Successful business model innovation requires both functioning value creation as well as functioning value capture mechanisms.

Companies typically capture value by producing and selling goods and services, renting out products, selling data, providing advertising space, subscriptions, freemiums, marketplaces with transaction fees, commissions, affiliate revenues, licensing fees, auctions, markups, or service fees (Teece, 2010). This list can be expanded almost indefinitely, with slight variations of these core mechanisms. Value can be captured by add-ons, barter (non-monetary compensation), up-front payments, cross selling, crowd-funding, crowd-sourcing, customer loyalty, direct selling and e-commerce, experience selling, flat rates, fractional ownership, franchising, guaranteed availability (insurance), hidden revenue, ingredient branding, system lock-in, mass customization, pay what you want, peer-to-peer exchange, performance-based contracting, self-service, shop-in-shop concepts, and more (Gassmann et al., 2014).

Table 25: Taxonomy of business models based on value capture configurations (based on Teece, 2010)

Taxonomy	Explanation	Examples in tourism and hospitality
Production model	Production and sale of goods and services	restaurants and hotels in general
Rental model	Revenue from the rental of goods	sport equipment rental companies
Data sales model	Collection and processing of data for sale	social media like Facebook
Advertising model	Sale of advertising space (Eyeballs)	ad-providers like Google
Subscription model	Subscription and regular access to services for a fee	streaming services like Netflix
Freemium model	Free basic product with revenues through premium services	software and services like Spotify
Marketplace model	Providing a marketplace for a transaction fee (usage fee)	online marketplaces like Airbnb
Commission model	Sales commission from the sale of goods and services	reseller of experiences or guided tours
Affiliate model	Revenue from collaboratively provided services	affiliations like Star Alliance
Licensing model	License fee for the use of industrial property rights (recurring)	technology providers like ARM
Auctions model	Auctions of goods and services	platforms like Ricardo
Markup model	Markup and revenue from price markup	resellers of branded goods
Service fee model	One-time usage fee for utilization	seat reservations in transport
Transaction enabler	Transaction fee for the use of infrastructure	payment providers like Mastercard

It can be challenging to assign one business model per company when looking at the value capture-based taxonomy. Today, many firms generate a variety of revenue streams through different mechanisms. A company can sell products or services, production-, transaction-, or subscription-based, but at the same time get revenue through data sales, advertising, and more (Perelygina et al., 2022, p. 7). This is especially true for companies with (partly) digitized business models. Furthermore, a distinct type of value capture is often closely linked to a specific value proposition (e.g., subscription models are often combined with flat-rate offerings).

While some authors focus on the value capture component only to classify business models (see Teece, 2010), others (partly) consider **additional dimensions** such as value proposition, value target, or value network (see Gassmann et al., 2014; Taran et al., 2016). Sometimes, these *patterns* or distinct combinations of *business model elements* are also referred to as *sub-meta-models* (Osterwalder et al., 2005). However, the labelling of (sub-meta) business models is far from standardized, as there are many different taxonomies (see also 7.2.2).

6.4 Macro level – business ecosystem

Today, competition often involves ecosystems rather than just products or services, with platforms representing a special case of ecosystems. The following sections briefly introduce the system view, which provides a macro-level view on firms, industries, and beyond.

6.4.1 Business ecosystem definition

The term business ecosystem dates back to the 1990s and, according to its original definition, stands for configurations, where organizations collaborate cooperatively as well as competitively (coopetition) to develop new products and services and serve the customer (Moore, 1993, p. 76). However, today, the term ecosystem is widely used by theory and practice and has become a rather fuzzy concept. While the term originates in ecology, it has found broad adoption in times of digitization, where various (business) actors are more connected than ever (cf. platform ecosystems). Business ecosystems are based on some form of orchestration, but are not structured as typical supplier networks or hierarchical systems (Jacobides et al., 2018, p. 2258).

Ecosystems bring new challenges, such as managing complementors who enhance the value of one's own value proposition without being in a hierarchical relationship with the company. Value creation mechanisms frequently extend beyond what can be achieved through Schumpeterian innovation: the reconfiguration of the value chain, the formation of strategic networks among firms, or the exploitation of firms' specific core competencies. The locus of value creation, and hence the suitable unit of analysis for scholars interested in value creation, spans the boundaries of firms and industries. (Zott et al., 2011, p. 1025)

6.4.2 Industry-specific ecosystem concepts

Despite their ability to span across industry boundaries, ecosystems are sometimes centered around specific domains. While tourism and hospitality can be seen as a distinct industry, the phenomenon of tourism as well as touristic experiences or elements in the guest cycle are provided by actors from many different sectors, such as real estate, transport, communications, and more. Tourism and hospitality can therefore be seen as an ideal case of ecosystem conceptualization.

Literature shows that ecosystem views on tourism have spread in recent years (see also Laesser & Kuster, 2023). The depiction of tourism in an ecosystem is often rooted in or related to the megatrend of digitization. Some authors define smart tourism ecosystems that are based on technology-supported interactions between consumers, suppliers, media, government, and intermediaries (Gretzel, Werthner, et al., 2015, p. 561). Others conceive similar models for so-called smart service ecosystems in tourism (Polese et al., 2018, p. 12). With a narrower focus but equally open system connections, some authors conceptualize hospitality ecosystems (Buhalis & Leung, 2018, p. 42; Philipp et al., 2022, p. 14) or even cruise ecosystem frameworks (Buhalis et al., 2022, p. 640).

Furthermore, a recent stream of literature in tourism and hospitality is emerging around the topic of entrepreneurial ecosystems in smart destinations. This approach puts an emphasis on the importance of entrepreneurs as core drivers of a system (Stam, 2015). In that sense, successful tourism destinations rely on entrepreneurship to become smart, sustainable, and resilient (see, e.g., Eichelberger et al., 2020; Philipp et al., 2022).

7 Practice collection

In this chapter, an empirical collection of current business processes (7.1), business models (7.2), and business ecosystems (7.3) in tourism and hospitality is presented, with an emphasis on the Swiss context. This section of the report adopts an exploratory approach, which builds both on primary research as well as secondary data from existing literature.

7.1 Business processes in tourism and hospitality

As introduced before, processes can be regarded from a provider and/or a customer perspective. In a process view of the customer journey or buying cycle, the tourist passes the following steps: awareness (of a need or destination), consideration (of a specific travel option or destination), information (trip planning and booking), arrival (at the destination), stay (including activities at the destination), departure and (ideally) revisit (see also Table 20). From a company or destination perspective, these steps can be matched with corresponding firm activities, which could be split into support and core or primary processes (see also Table 22). Support activities include infrastructure, technology, human resources as well as procurement. Based on this, primary activities such as in- and outbound logistics, operations, marketing and sales, and services are provided.

Table 26: Co-created processes in tourism and hospitality, based on business processes (cf. Table 20 and Table 22)

Step	Customer View	Company View	Step	Internal Business Processes	Activity Type
1	Awareness	Offering Design	a, b	Firm Infrastructure, Technology Development	Support Activities
2	Consideration	Lead Generation	c	Human Resource Management	
3	Information	Booking	d	Procurement	
4	Arrival	(Pre-)Arrival	A	Logistics (in/out)	Primary Activities
5	Stay	Experience	B	Operations	
6	Departure	(Post-)Departure	C	Marketing and Sales	
7	Revisit	Return	D	Service	

In the following section, the most relevant digitally enabled (business) processes in Swiss tourism and hospitality are presented. The focus thereby lies in the company's view. However, as products and services in tourism are often co-created by providers and tourists, the company processes and the customer journey can be regarded as two sides of the same coin. This becomes apparent in the service blueprint of any touristic offering (see Table 21). The subsequent collection of applications for digital business processes is based on an empirical approach to the providers' side of the service delivery. The identified applications in the field are analyzed regarding functionalities or value propositions (7.1.1) and sorted into process steps (7.1.2).

7.1.1 Collecting applications for digital business processes

As described above, the empirical collection of implemented IT solutions in the (Swiss) tourism and hospitality domain draws from a wide range of sources: Industry reports on digitization in tourism and transport (such as Laesser et al., 2021; Laesser & Kuster, 2023; Laesser et al., 2018), regional inventories (such as Gollietz et al., 2023; Interessengemeinschaft Tourismus Graubünden, 2021; Schegg, 2023), expert input from practitioners in the field (such as Thomann Hospitality Management AG, ComCierge GmbH, Axeba AG) as well as further resources with a more international scope (with industry-specific platforms like Skift.com and HotelTechReport.com as well as generic IT benchmark platforms such as Capterra.com and SoftwareAdvice.com).

The collection of digital applications (products or services) has been screened regarding their specificity for tourism and hospitality (T&H) as well as for their value proposition(s) as specified on their websites, ranging from one functionality for highly specific solutions to up to 25 different functionalities (No.) for platform solutions. The list does not contain any consulting or implementation firms, local utility or service providers, startups in an early stage without proven products as well as solutions that have been taken over or fully integrated by competitors. Due to the high degree of innovation and dynamics in the market, it is important to state that the collection at hand shows the status of the field as of early 2024. It is very well possible, that companies have released new features (No.), have been taken over by competitors or closed entirely, while new players might have emerged in the meantime.

Table 27: List of frequently deployed applications in (Swiss) T&H (own list, early 2024; T&H = industry-specific; No. = # of functionalities)

Product or Service	Link	T&H	No.	Product or Service	Link	T&H	No.
4tix	https://www.4tix.ch/	x	4	Blent	https://www.blent.io/	x	5
Abacus	https://www.abacus.ch/		6	Bodet	https://www.bodet.com/		3
Abitari	https://www.abitari.com/	x	4	Boncard	https://boncard.ch/		4
AccuVWeather	https://afb.accuweather.com/		1	Book4time	https://book4time.com/	x	6
ActiveCampaign	https://www.activecampaign.com/		5	Bookboost	https://www.bookboost.io/	x	4
AcyMailing	https://www.acymailing.com/		1	Booking.com	https://www.booking.com/	x	1
AdmiCash	https://www.admicash.swiss/		1	BookingCorner	https://www.booking-corner.com/	x	3
AdmiralCloud	https://www.admiralcloud.com/		2	BookingKit	https://bookingkit.com/	x	3
Agoda	https://www.agoda.com/	x	1	BookingSync	https://www.bookingsync.com/	x	8
AI Concierge	https://goodguys.ai/	x	3	Boukii	https://boukii.ch/	x	9
Airbnb	https://www.airbnb.ch/	x	1	Braze	https://www.braze.com/		3
Airdna	https://www.airdna.co/	x	2	Buffer	https://buffer.com/		4
Aleno	https://www.aleno.me/	x	4	BusPro	https://www.buspro.ch/		3
Alge Timing	https://alge-timing.com/	(x)	3	Busyroom	https://www.busy-rooms.com/	x	11
Alipay	https://global.alipay.com/		1	Butlaroo	https://www.butlaroo.com/	x	4
AlturosDestinations	https://www.alturos.com/	x	25	Bynder	https://www.bynder.com/		2
Amadeus	https://amadeus.com/	x	1	C.I.T.I	https://www.rentalp.com/en/about	x	4
Amenitiz	https://amenitiz.com/	x	11	Campaign Monitor	https://www.campaignmonitor.com/		3
Apaleo	https://apaleo.com/	x	4	Canva	https://www.canva.com/		4
Apibase	https://get.apibase.com/	x	4	CashCtrl	https://cashctrl.com/		2
Asana	https://asana.com/		1	Cashy-POS	https://www.cashy-pos.ch/		2
AskSuite	https://asksuite.com/	x	6	Caymland	https://caymland.com/		5
ASSD	https://www.assd.com/	x	4	CDM	https://www.masch.com/	x	9
AstoundCommerce	https://astoundcommerce.com/		6	Cendyn	https://www.cendyn.com/	x	7
ATASSpro	https://www.technoalpin.com/	x	4	ChatGPT	https://chat.openai.com/		3
Aubep	https://www.aubep.ch/		2	Cisco	https://www.cisco.com/		3
Avantio	https://www.avantio.com/	x	7	Citrix	https://www.citrix.com/		1
AVS	https://www.avs.de/	(x)	4	Clair	https://www.clair.cc/	x	6
AWS	https://aws.amazon.com/		1	CleverReach	https://www.cleverreach.com/		1
Axess	https://teamaxess.com/	(x)	6	ClicData	https://www.clicdata.com/		3
Ayden	https://www.adyen.com/		3	CloudBeds	https://www.cloudbeds.com/	x	6
Azure	https://azure.microsoft.com/		1	Cloudrex	https://www.cloudrex.com/		1
Bakery2b	https://www.hsssoft.com/wawi-bakery2b	(x)	4	Clubinone	https://www.clubinone.com/	x	2
Baldegger Sortec	https://baldeggersortec.ch/		2	CobraCRM	https://www.cobraag.ch/		2
Banana	https://www.banana.ch/		3	Coda	https://coda.io/		3
Beekeeper	https://www.beekeeper.io/		3	Combit	https://www.combit.net/		1
Betisoft	https://betisoft.com/	x	3	ContentDesk	https://contentdesk.io/		5
Bexio	https://www.bexio.com/		5	Contentful	https://www.contentful.com/		1

...Continued Table	Link	T&H	No.	Product or Service	Link	T&H	No.
Cortec	https://cortecag.ch/		5	HBenchmark	https://www.hbenchmark.com/	x	2
CouCou&Co	https://coucouapp.ch/	x	4	HelloTess	https://www.hellotess.com/		9
Crésus	https://cresus.ch/		2	Hogatex	https://www.hogatex.ch/	x	2
CrowdRiff	https://crowdriff.com/	x	3	Holidu	https://www.holidu.ch/	x	2
Ctoutvert	https://ctoutvert.com/	x	7	HomeToGo	https://www.hometogo.ch/	x	2
Cubilis	https://www.cubilis.at/	x	3	HospitalityCockpit	https://www.hospitalitycockpit.ch/	x	1
CustomerAlliance	https://www.customer-alliance.com/		3	HotelCinqueStelle	https://www.hotelcinquestelle.cloud/	x	5
Dailypoint	https://www.dailypoint.com/	x	10	HotelKit	https://hotelkit.net/	x	3
Datasport	https://www.datasport.com/	(x)	3	Hotellistat	https://hotellistat.com/	x	4
D-Edge	https://www.d-edge.com/	x	14	HotelNetSolutions	https://hotelnetsolutions.de/	x	7
Deskline	https://interfaces.deskline.net/	x	2	Hotelpac	https://hotelpac.com/	x	8
Destination.one	https://www.destination.one/	x	13	Hotels.com	https://ch.hotels.com/	x	1
Detco	https://www.detco.de/	(x)	4	HotelsCombined	https://www.hotelscombined.com/	x	2
DigitalOcean	https://www.digitalocean.com/		2	HotelSpider	https://www.hotel-spider.com/	x	6
Dinaco	https://www.dinaco.io/	(x)	2	HotelPartner Yield	https://hotelpartner-ym.com/	x	2
Dirs21	https://www.dirs21.de/	x	4	Hotjar	https://www.hotjar.com/		1
DiscoverSwiss	https://discover.swiss/	x	9	Hoxell	https://hoxell.com/	x	6
Docuware	https://start.docuware.com/		4	HQ revenue	https://www.hqrevenue.com/	x	1
Dodeley	https://www.dodeley.com/	(x)	1	HRS	https://www.hrs.com/	x	1
Doqio	https://www.doqio.net/		1	HS3 Hotelsoftware	https://hs3-hotelsoftware.de/	x	7
DormProject	https://www.dormproject.ch/	x	8	HubSpot	https://www.hubspot.de/		3
Drupal	https://www.drupal.org/		1	Hyll	https://hyll.com/	x	7
Duetto	https://www.duettocloud.com/	x	3	inaxel	https://www.inaxel.com/	x	11
Duve	https://duve.com/	x	8	Incert	https://www.incert.at/	x	6
Dynamics 365	https://dynamics.microsoft.com/		2	Infhotik	https://infhotik.com/	x	6
EasyBooking	https://www.easybooking.eu/	x	12	InfoSnow	https://infosnow.ch/	x	4
Easyrent	https://www.wintersteiger.com/	(x)	4	innRoad	https://www.innroad.com/	x	5
EasyShop	https://easystore.com/		2	Instagram	https://www.instagram.com/		3
Ebookers	https://www.ebookers.ch/	x	1	Interhome	https://www.interhome.ch/	x	2
E-Domizil	https://www.e-domizil.ch/	x	1	Intermaps	https://www.intermaps.com/	x	6
E-Guma	https://www.e-guma.ch/	(x)	1	IntersportRent	https://www.intersportrent.ch/	x	3
Elements	https://www.elements.at/	(x)	3	Inxmail	https://www.campaignmonitor.com/		2
E-Liberty	https://www.eliberty.fr/	x	9	i-rent	https://www.i-rent.net/	x	4
Elo	https://www.elo.com/		2	iVork	https://www.apple.com/chde/iwork/		1
E-Marketing Suite	https://www.wilken.de/tourismus/	(x)	2	Jimdo	https://www.jimdo.com/		5
Emarsys	https://emarsys.com/		5	JobDone	https://jobdone.app/	(x)	3
e-Pack-Hygiene	https://www.ecobion.ch/	(x)	2	Joomla	https://www.joomla.org/		1
ERV	https://www.erv.ch/	(x)	1	Just Eat	https://www.just-eat.ch/	x	3
Escapio	https://de.escapio.com/	x	1	Kayak	https://www.kayak.ch/	x	2
Europa3000	https://www.europa3000.ch/		3	Keepeek	https://www.keepeek.com/		2
EuroTime	https://www.swit-ag.ch/eurotime	x	2	Kelio	https://www.kelio.ch/		2
Eventbrite	https://www.eventbrite.ch/		2	Klara	https://www.klara.ch/		10
Eventfrog	https://eventfrog.ch/		2	Klook	https://www.klook.com/	x	4
EventTemple	https://www.eventtemple.com/	x	5	Kognitiv	https://www.kognitiv.com/		3
Expedia	https://www.expedia.ch/	x	1	KSD	https://www.ksd.fr/		2
Experience Bank	https://experiencebank.travel/	x	3	LibreOffice	https://de.libreoffice.org/		1
Experience Cloud	https://business.adobe.com/		5	Liftoptia	https://www.liftopia.com/	x	2
Facebook	https://www.facebook.com/		4	Lighthouse	https://www.mylighthouse.com/	x	3
Fairgate	https://fairgate.ch/		5	Lightspeed	https://www.lightspeedhq.com/		9
Fairmas	https://fairmas.com/	x	4	LinkedIn	https://www.linkedin.com/		2
Felizzio	https://www.felizzio.com/	(x)	2	Looker Studio	https://lookerstudio.google.com/		1
Feratel	https://www.feratel.at/	x	10	Loxone	https://www.loxone.com/		4
Ferienshop	https://www.ferienshop.com/	x	18	Loyverse	https://loyverse.com/		8
Flexkeeping	https://www.flexkeeping.com/	x	4	Lunchgate	https://www.lunchgate.ch/	x	1
FLM	https://www.flm.ch/		2	Magnolia	https://www.magnolia-cms.com/	x	1
Flowbox	https://getflowbox.com/		3	MailChimp	https://mailchimp.com/		3
Flyr Hospitality	https://flyr.com/hospitality/	(x)	2	MailerLite	https://www.mailerlite.com/		2
Foratable	https://go.foratable.com/	x	4	MailingWork	https://mailingwork.de/		1
Frontify	https://www.frontify.com/		2	Make	https://www.make.com/		1
Fusedeck	https://fusedeck.com/		2	Mapado	https://www.mapado.com/	(x)	5
Gastfreund	https://www.gastfreund.net/	x	5	Matomo	https://matomo.org/		1
GastroBasic	https://gastrobasic.gastroconsult.ch/	x	1	MeinToubiz	https://www.land-in-sicht.de/	x	6
Gastrodat	https://www.gastrodat.com/	x	7	Memoria	https://memoria.biz/		6
Gastronovi	https://www.gastronovi.com/	x	12	MessageBird	https://messagebird.com/		5
GastroTime	https://www.gastroconsult.ch/gastrotime	x	1	Metenews	https://meteoneews.ch/		1
Gauvendi	https://www.gauvendi.com/	x	5	Meteoblue	https://content.meteoblue.com/		1
GetLocal	https://get-local.com/	x	1	MeteoSwiss	https://www.meteoswiss.admin.ch/		1
GetYourGuide	https://www.getyourguide.ch/	x	5	Mews	https://www.mews.com/	x	11
Ginto	https://www.ginto.guide/	x	3	Microsoft 365	https://www.microsoft.com/		10
Google Ads	https://ads.google.com/		1	Mirus	https://mirus.ch/	x	2
Google Analytics	https://analytics.google.com/		2	MisterBooking	https://www.misterbooking.net/	x	6
Google Business	https://www.google.com/business/		9	Momondo	https://www.momondo.ch/	x	2
Google Hotel Ads	https://www.google.com/	x	2	Monday.com	https://monday.com/		4
Google Maps	https://www.google.com/maps		3	MSO	https://www.mso.swiss/	(x)	5
Google Workspace	https://workspace.google.com/		7	MyCity	https://www.mycity.travel/	x	13
Groupe.id	https://www.groupeid.ch/		4	MyClimate	https://www.myclimate.org/		1
Guestonline	https://www.guestonline.io/	x	10	MyLocalina	https://mylocalina.com/	x	2
Guide	https://www.guide.com/	x	4	MyTouros	https://mytourobs.ch/	x	3
Guidos	https://www.guidos.tours/	x	3	Neos	https://www.neos.io/		1
Guuru	https://www.guuru.com/		5	Netscaler	https://www.netscaler.com/		3
Happyhotel	https://happyhotel.io/	x	2	Nexi	https://www.nexi.swiss/		2

...Continued Table	Link	T&H	No.	Product or Service	Link	T&H	No.
Nexoya	https://www.nexoya.com/		2	Spotlio	https://www.spotlio.com/	x	9
NextEvent	https://www.nextevent.com/	(x)	2	SRF Meteo	https://www.srf.ch/meteo/		1
Nova	https://developer.sbb.ch/apis/nova/	x	3	Stardekk	https://www.stardekk.de/	x	5
NovaCom	https://www.novacom.at/		3	Stayntouch	https://www.stayntouch.com/	x	13
n-tree	https://n-tree.com/	(x)	3	STC	https://switzerlandtravelcentre.com/	x	3
NumBirds	https://numbirds.com/		1	STnet	https://www.stnet.ch/	x	5
OfficeMaker	https://www.officemaker.ch/		4	Storyblok	https://www.storyblok.com/		1
Okay	https://oaky.com/	x	3	Straiv	https://straiv.io/	x	6
Omni	https://insidelabs.tech/	x	24	Strapi	https://strapi.io/		1
OpenBooking	https://openbooking.ch/	x	1	Strava API	https://developers.strava.com/		4
OpenStreetMap	https://www.openstreetmap.org/		2	Stripe	https://stripe.com/		1
OpenTable	https://www.opentable.de/	x	5	SugarCRM	https://www.sugarcrm.com/		2
Opera	https://www.oracle.com/hospitality/	(x)	9	Suite8 Property	https://www.oracle.com/hospitality/	x	8
Orderbird	https://www.orderbird.com/		2	Sunet	https://sunet.suva.ch/		2
OrderMonkey	https://www.ordermonkey.com/	x	5	Sunkhronos	https://sunkhronos.ch/	(x)	4
Outdooractive	https://business.outdooractive.com/	x	7	Sweeply	https://getsweeply.com/	x	2
Palisis	https://www.palisis.com/	x	7	SwissRent	https://swissrent.com/	x	3
Payyo	https://payyo.ch/	x	2	SwissSalary	https://swissalary.ch/		2
Pimcore	https://pimcore.com/		4	SwissWorkTime	https://swissworktime.ch/		2
Pixio	https://www.pixio.io/		2	SynXis	https://www.sabrehospitality.com/	x	5
Planet	https://www.wearplanet.com/	(x)	16	Tableau	https://www.tableau.com/		1
Playable	https://playable.com/		4	TableSnapper	https://www.tablesnapper.com/	x	4
Power BI	https://powerbi.microsoft.com/		1	Tcpo	https://www.tcpo.com/		7
PriceLabs	https://hello.pricelabs.co/	x	2	Tetra	https://tetra-software.de/		4
Priceline	https://www.priceline.com/	x	1	TheFork	https://www.thefork.ch/	x	3
Pricenow	https://www.pricenow.ch/	x	2	Threema	https://threema.ch/		1
Prognolite	https://prognolite.com/	x	4	Ticketcorner	https://www.ticketcorner.ch/	(x)	3
Protonmail	https://proton.me/		2	TicketGateway	https://www.ticketgateway.com/		3
Q3	https://q3software.ch/		4	Ticketino	https://www.ticketino.com/		2
Qualitelis	https://www.qualitelis.com/	x	4	TicketTailor	https://www.tickettailor.com/	(x)	2
Respondelligent	https://respondelligent.com/		3	TikTok	https://www.tiktok.com/		3
Receptio	https://receptio.net/	x	4	TimeMoto	https://www.timemoto.com/		2
Reconline	https://www.reconline.com/	x	5	TimeTac	https://www.timetac.com/		2
Refline	https://refline.ch/		3	Tipee	https://www.tipee.ch/		2
Regiondo	https://pro.regiondo.com/	x	5	Tomas	https://touristdatashop.ch/	x	11
Rentmaxx	https://rentmaxx.com/	x	6	Topal	https://www.topal.ch/		2
Reservit	https://www.reservit.com/	x	3	Topin	https://www.topin.travel/	x	4
Retool	https://retool.com/		1	Tourify	https://tourify.ch/	x	6
Revinat	https://www.revinat.com/		5	TourX	https://www.2.tourx.ch/	x	3
RoomPriceGenie	https://roompricegenie.com/	x	2	TraumFerienwhg.	https://www.traum-ferienwohnungen.ch/	x	1
RoomRacon	https://roomracon.de/	x	11	Travelport	https://www.travelport.com/	x	1
Roundshot	https://www.roundshot.com/	(x)	1	Tray.io	https://tray.io/		1
SaaS.de	https://www.saas.de/		2	TrekSoft	https://www.treksoft.com/	x	6
SabeeApp	https://www.sabeeapp.com/	x	9	Trello	https://trello.com/		1
Sage	https://www.sage.com/		5	Tripadvisor	https://www.tripadvisor.com/	x	4
Salesforce	https://www.salesforce.com/		1	Trivago	https://www.trivago.ch/	x	2
Sanity Studio	https://www.sanity.io/		2	TrustYou	https://www.trustyou.com/	x	1
SAP	https://www.sap.com/		4	Tweebie	https://lpeak.ch/	(x)	3
SBC	https://www.saia-pcd.com/		4	Twint	https://www.twint.ch/		1
Schultes Kassensyst.	https://schultes-kassen.de/		2	Typo3	https://typo3.org/		1
SchweizMobil	https://schweizmobil.ch/	x	6	UberEats	https://www.ubereats.com/	x	3
Seetickets	https://www.seetickets.com/		2	Ucopia	https://www.ucopia.com/		1
Segment	https://segment.com/		2	Umbraco	https://umbraco.com/		2
SharpSpring	https://de.sharpspring.com/		7	Unifocus	https://www.unifocus.com/	(x)	4
Shopify	https://www.shopify.com/		11	Vectron	https://www.vectron-systems.com/		6
Shyftplan	https://shyftplan.com/		3	VerbierDelivery	https://verbierdelivery.com/	x	3
Siemens	https://www.siemens.com/		5	VerticalBooking	https://www.verticalbooking.com/	x	9
Signal	https://signal.org/		1	Viator	https://www.viator.com/	x	7
Simon&Josef	https://simonandjosef.com/	x	3	ViktoriaData	https://www.viktoriadata.ch/	x	3
SimpleBooking	https://www.simplebooking.travel/	x	5	Vioma	https://www.vioma.de/	x	12
SisControl	https://sisag.ch/produkte/siscontrol	x	7	VisualPlanning	https://www.visual-planning.com/		4
SisMedia	https://sisag.ch/produkte/sismedia	x	5	Visyt	https://visytapp/	x	1
Sitecore	https://www.sitecore.com/		4	Volunteo	https://volunteo.com/	(x)	2
SiteMinder	https://www.siteminder.com/	x	10	WeChatPay	https://pay.weixin.qq.com/index.php		1
Skadii	https://skadii.global/	x	6	Whatsapp	https://web.whatsapp.com/		3
Skello	https://www.skello.de/	(x)	4	Winbiz	https://www.winbiz.ch/		5
Skidata	https://www.skidata.com/	(x)	7	Wix	https://de.wix.com/		5
Skipodium	https://skipodium.com/	x	2	WND	https://www.wnd.ch/	(x)	6
SkischulAssistent	https://www.skischulassistent.at/	x	6	WordPress	https://wordpress.com/		1
Skitude	https://skitude.com/	x	8	Workato	https://www.workato.com/		1
Skype	https://www.skype.com/		2	Worldline	https://worldline.com/		1
Skyscanner	https://www.skyscanner.ch/	x	1	WSports	https://www.waldhart.at/	x	4
Slack	https://slack.com/		1	Xenia	https://www.xeno-data.de/	x	2
Smartpricer	https://www.smart-pricer.com/	x	3	Yoordi	https://yoordi.com/	x	4
SmartToni	https://www.smarttoni.com/	x	4	YouDoc	https://youdoc.ch/		2
Smood	https://www.smood.ch/	x	4	YouTube	https://www.youtube.com/		3
Snapchat	https://www.snapchat.com/		3	Zapier	https://zapier.com/		1
Snowell	https://www.snowell.com/	x	3	ZenChef	https://www.zenchef.com/	x	8
SnowOffice SSMS	https://snow-office.com/	x	4	Zendes	https://www.zendes.com/		4
SnowSat	https://www.snowsats.com/	x	2	Zoom	https://zoom.us/		1
Snowvisual	https://www.demaclenko.com/	x	3	ZTerminal	https://www.zt.net.ch/zTerminal	x	1

7.1.2 Mapping of digitized business processes

The collection of 400 frequently used technological solutions in (Swiss) tourism (Table 27) covers 60 functionalities, which can be analyzed to get a better understanding of the state of digitization. By manually sorting the functionalities as featured on the respective application website, 14 dominant clusters have been identified (Table 30).

Table 28: Manual clustering of functionalities from analyzed applications (400 applications, 60 functionalities, 14 clusters; own table)

Cluster (manual)	Functionalities (based on empirical collection of applications)
Online Directories with Rather Static Entries	Online Directory, Company List; Points of Interest Database; Event Database, Exhibit Collection; Excursion Database, Tour Collection
Content and Product Management Systems	Content Management System, Website Builder; Product Information Management; Digital Asset Management, Content Hub, Headless CMS
Systems for Creation and Distribution of Ads	Ad Tech, Ad Distribution, Search Engine Optimization; Metasearch Advertising; Email Newsletter Distribution; Reputation Management, Customer Feedback, Loyalty Social Media Management, Electronic Word of Mouth
Platforms for Automated Generation of Sales	Online Travel Agency, Web Booking Platform; Distribution Channel Management; Revenue Management, Rate Shopper, Pricing; Upselling Tool, Upgrading Software; Marketing Automation, Process Automator
Applications for Self-administered Bookings	Website Service, Microsite, Microstore; Web Booking Engine, Online Shop; Computer Reservation System; Appointment Booking System; Table Reservation System
Tools for the Processing of Payments	Payment Processing, Payment Services; Delivery Service, Ordering Platform; Point of Sale Technology; Leisure Insurance, Travel Coverage, Eco-Compensation
Instruments for Dialogue with Customers	External Communications Tool; Chatbot, Chat App, Personal Assistant; Customer Engagement, Gamification; Routing, Guiding, Virtual Touring
Tools for Customer Service Offerings	Guest-App, Customer Service Platform; Self-Service Kiosk, Digital Check-in-out; Ticketing, Couponing, Vouchers; Guest Cards, Transport Cards, Ski Cards; Rental System, Lending of Equipment
Systems for Monitoring of Live Status	Live Status Service, Digital Signage; Live Webcam Service; Meteo Data Provision Visitor Management, Crowd Management; Trail Management, Park Maintenance; Access Control, Keyless Entry, Mobile Key, Door Locks; Sports Timing Service, Sports Time Tracking
Integration of Services and Resources	Destination Management System; Master Data Management; Service Integration Platform, Data Integrator
Systems for Management of Resources	Enterprise Resource Planning, Property Management System; Inventory Management, Order Execution, Purchasing; Customer Relationship Management
Tools for Company-internal Collaboration	Internal Communications Tools; Project Management, Task Planning, Staff Collaboration; Office Suite, Office Software; Human Resources Management, Time Tracking, Payroll
Applications for Company Administration	Accounting, Finance, Invoice Processing; Tax Reporting, Statistical Reporting; Business Intelligence, Analytics
Network System for Information Technology	Network System Services; Destination Wifi, Location Wifi; Building Automation, Smart Room, In-Room Tech Cloud Computing, Virtualization Platform; Application Distribution Platform

In the following table, the 60 functionalities which have been identified among the empirical collection of 400 applications (tools) are listed based on their step or element in the value chain of tourism and hospitality (firm view) before presenting them in a visual cluster network. Apparently, penetration with digital tools is highest in marketing and sales. This is no surprise, as it is easier to digitize information than, e.g., operational tasks, which might require robotics.

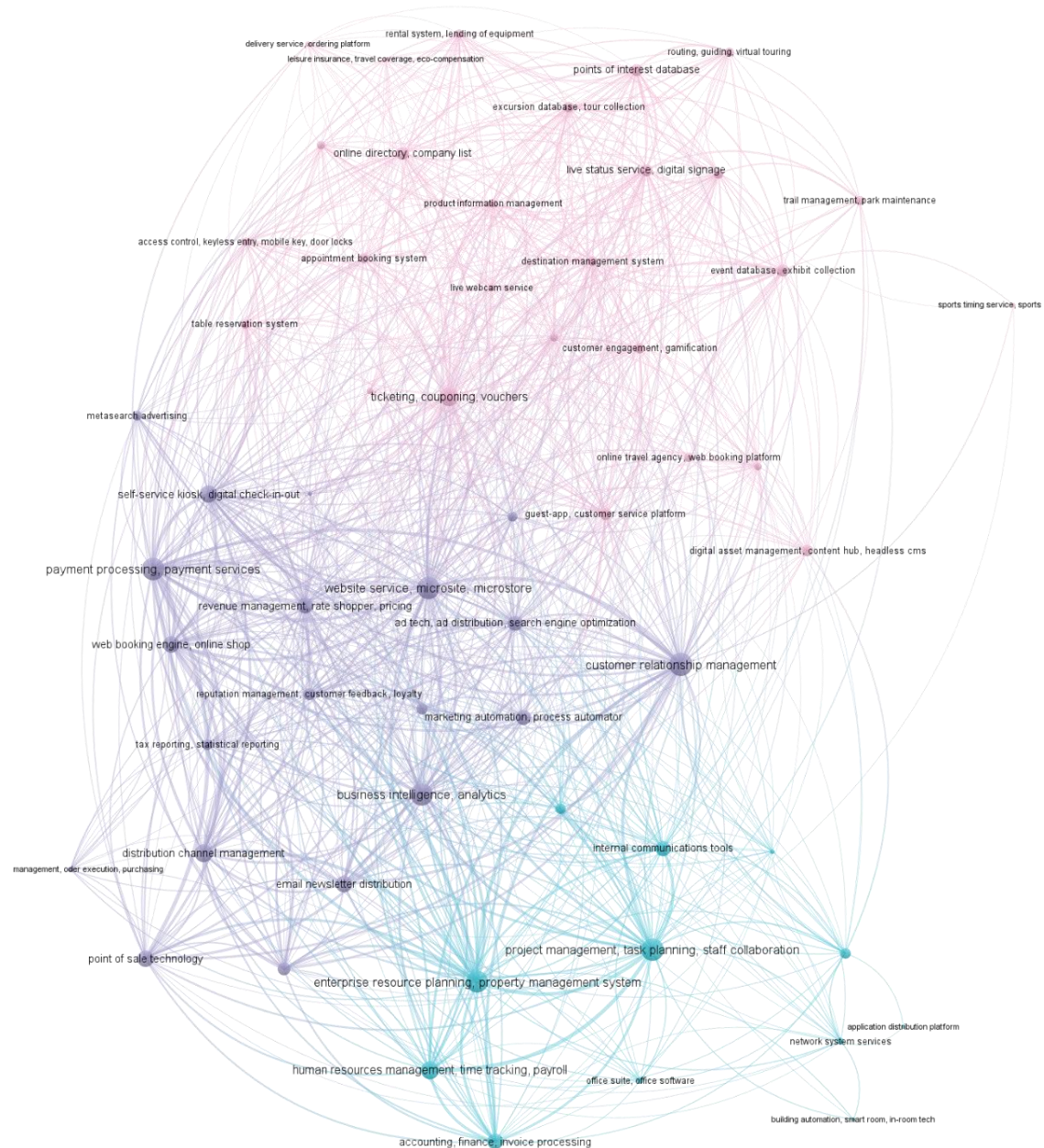
Table 29: Digitally enabled processes in (Swiss) tourism and hospitality (dominant step in buying cycle only by approximation; cf. Table 26)

Process / Service (Functionality)	Abbr.	No. of Tools	Step in Buying Cycle	Step/Element in Value Chain
Destination Management System	DMS	16	4	(a) Firm Infrastructure and (b) Technology Development
Service Integration Platform, Data Integrator		12	4	
Enterprise Resource Planning, Property Management System	ERP/PMS	75	5	(c) HR Management
Internal Communications Tools		34	5	
Office Suite, Office Software		7	5	
Business Intelligence, Analytics	BI	79	6	
Accounting, Finance, Invoice Processing		40	6	
Tax Reporting, Statistical Reporting		19	6	
Cloud Computing, Virtualization Platform		19	5	
Network System Services		7	5	
Destination Wifi, Location Wifi		4	5	
Building Automation, Smart Room, In-Room Tech		3	5	
Application Distribution Platform		2	5	(d) Procurement
Project Management, Task Planning, Staff Collaboration		78	5	
Human Resources Management, Time Tracking, Payroll	HRM	53	5	(A) Logistics in-/outbound
Online Directory, Company List		27	2	
Points of Interest Database	POI	24	2	
Event Database, Exhibit Collection		22	2	
Excursion Database, Tour Collection		19	2	
Live Status Service, Digital Signage		24	5	
Live Webcam Service		6	5	
Meteo Data Provision		5	5	
Inventory Management, Order Execution, Purchasing		5	5	
Delivery Service, Ordering Platform		5	5	(B) Operations
Routing, Guiding, Virtual Touring		13	5	
Ticketing, Couponing, Vouchers		57	4	
Guest Cards, Transport Cards, Ski Cards		12	4	
Visitor Management, Crowd Management		15	5	
Access Control, Keyless Entry, Mobile Key, Door Locks		12	5	
Sports Timing Service, Sports Time Tracking		3	5	
Web Booking Engine, Online Shop	WBE	43	3	
Computer Reservation System	CRS	26	3	
Appointment Booking System		16	3	(C) Marketing and Sales
Table Reservation System		14	3	
Trail Management, Park Maintenance		13	5	
Rental System, Lending of Equipment		12	4	
Master Data Management	MDM	9	4	
Customer Relationship Management	CRM	84	4	
Digital Asset Management, Content Hub, Headless CMS	DAM	20	2	
Content Management System, Website Builder	CMS	16	2	
Product Information Management	PIM	11	2	
Email Newsletter Distribution		42	6	(D) Service
Reputation Management, Customer Feedback, Loyalty		22	6	
Social Media Management, Electronic Word of Mouth		21	1	
Ad Tech, Ad Distribution, Search Engine Optimization	SEO	35	1	
Metasearch Advertising		16	1	
Distribution Channel Management		49	3	
Revenue Management, Rate Shopper, Pricing		40	3	
Online Travel Agency, Web Booking Platform	OTA	14	3	
Website Service, Microsite, Microstore		81	3	
Marketing Automation, Process Automator		34	4	
Upselling Tool, Upgrading Software		4	4	(D) Service
Payment Processing, Payment Services		79	5	
Point of Sale Technology	POS	43	5	
Leisure Insurance, Travel Coverage, Eco-Compensation		3	3	
Customer Engagement, Gamification		19	5	
External Communications Tool		19	4	
Chatbot, Chat App, Personal Assistant		8	4	(D) Service
Self-Service Kiosk, Digital Check-in-out		46	4	
Guest-App, Customer Service Platform		22	4	

A clustered network view shows which functionalities (from Table 29) are frequently combined and thus serve processes that are highly interlinked. The following algorithmic cluster analysis (created with VOSviewer) groups functionalities from highly customer-facing applications (frontstage) to rather company-internal tools (backstage). This map can be seen as a status quo visualization of digital business process redesign in tourism and hospitality. Further developments might be driven by technological advancements like AI and robotics (cf. first part of this report), but also by new business model configurations (cf. next section).

Figure 78: Digital process map of Swiss tourism and hospitality (status quo)

Clustered network view of the most relevant digitally enabled functions (own visualization, created with VOSviewer)



Legend

This map contains 60 of the most relevant functions for Swiss tourism and hospitality. Due to space limits, some circles are not (fully) labelled. The larger the circle (and label), the more applications or tools are available to digitally enable the respective functionality or (business) process. The proximity of circles and connecting lines represent a frequent combination or integration of the functionality in one single solution or tool. The top part of the figure (red cluster) contains primarily frontstage applications while the bottom part (blue cluster) contains backstage tools.

7.2 Business models in tourism and hospitality

After introducing business (meta-)models in the theoretical section (6.3), instances of the models are discussed below. Therefore, an empirical collection of real-world cases is presented. This is done with the help of the most granular business model framework (cf. 6.3.1), the so-called business model canvas with its nine constitutive elements (Osterwalder et al., 2005). In the first section, the case collection is structured along the value creation configuration. In the second section, the collection is extended by a set of configurations based on value capture mechanisms.

7.2.1 Business models by type of value creation

The following chapter consists of conceptualizations, representations, and descriptions of real-world business models in the tourism and hospitality sector. The underlying methodology is explorative, combining two approaches to identify explanatory business models: On the one hand, large international players in the tourism industry are identified based on market capitalization, assuming these business models have proven to be successful. On the other hand, a selection of Swiss firms operating in the industry is chosen to complement the international selection and offer national or regional examples of the business model type. The following subsections are structured along the four key types of value creation configurations (see 6.3.2.1).

7.2.1.1 Layer player models

Avis Rent a Car System (Figure 79) adopts the role of a layer player in the tourism industry by specializing in rental car services, focusing on a specific step of the traveler's journey. Avis collaborates with various partners, providing independent transportation solutions that seamlessly integrate into the broader tourism experience in a global travel ecosystem.

Figure 79: Business model canvas of Avis Rent a Car System, LLC (based on analysis of avis.com)

Key Partners • Vehicle manufacturers and suppliers • Travel agencies and online travel platforms • Corporate clients and businesses • Insurance providers	Key Activities • Fleet management and maintenance • Customer service and support • Marketing and advertising • Partnership development Key Resources • Fleet of rental vehicles • Rental locations and infrastructure • Online reservation and IT systems • Trained staff for customer service	Value Proposition • Extensive fleet of rental vehicles • Convenient and flexible booking options • Avis Preferred loyalty program • Corporate and business solutions • Global network and accessibility	Customer Relation • User-friendly online booking experience • Customer support for reservations and inquiries • Avis Preferred program for personalized services • Marketing and promotional campaign Channels • Online reservation platform (Avis website, mobile app) • Physical rental locations (airports, cities) • Partnering with (online) travel agencies • Corporate partnerships and agreements	Customer Segments • Tourists • Business travelers • Local renters • Corporate clients
Cost Structure • Vehicle acquisition and maintenance • Staff salaries and training • Marketing and advertising expenses • Technology and IT systems			Revenue Streams • Car rental fees (daily, weekly, monthly rates) • Additional services (insurance, fuel packages, GPS) • Corporate contracts and partnerships • Premium and specialty vehicle rentals	

Figure 80: Business model canvas of Accor S.A. (based on analysis of all.accor.com, ibis.accor.com, novotel.accor.com)

Key Partners - Local businesses and suppliers - Travel agencies and online platforms - Corporate clients and event organizers - Technology providers	Key Activities - Hotel management and operations (2300 hotels) - Brand licensing operations (3200 hotels) - Marketing and promotion - Customer service and experience management - Partnership development	Value Proposition - Diverse hotel brands catering to different preferences and budgets - Loyalty programs (e.g., Accor Live Limitless) - Meeting and event facilities - Restaurants and catering services - Global presence and accessibility	Customer Relation - Online and mobile booking experience - Customer support for reservations - Loyalty program - Personalized services for business clients - Social media interactions	Customer Segments - Business travelers - Tourists and leisure travelers - Event organizers - Budget-conscious travelers (specifically for Ibis)
	Key Resources - Hotel properties and infrastructure - Trained hospitality staff - Marketing and branding (various sub-brands) - Technology and reservation systems		Channels - Online booking platforms (Accor website, mobile app) - Travel agencies - Corporate partnerships - Global distribution systems (GDS)	
Cost Structure - Property management and maintenance - Staff salaries and training - Marketing and advertising - Technology and IT systems			Revenue Streams - Room bookings (various categories and brands) - Event and conference bookings - Food and beverage sales - Loyalty program memberships	

Accor (Figure 80) adopts the role of a layer player in the tourism industry by specializing in accommodation services, focusing primarily on hotels, resorts, and serviced residences. With a diverse portfolio of brands, Accor collaborates with various travel partners while maintaining its focus on offering diverse lodging options. Travelers can autonomously choose and book Accor accommodations, emphasizing the company's role as a layer player within the broader tourism ecosystem. Despite its global presence, Accor's influence is concentrated within the accommodation layer, providing flexibility and choice for travelers in their overnight experiences.

Figure 81: Business model canvas of Booking.com Ltd. (based on analysis of booking.com)

Key Partners - Hotels and accommodation providers - Payment processors - Travel agencies and tour operators - Online travel communities	Key Activities - Curating and updating the list of accommodations - Payment processors - Improving website and app functionality - Marketing and promotional activities - Customer support and issue resolution Key Resources - Website and mobile app development and maintenance - Database with user information and contracts with accommodations - Marketing, advertising and data teams - Customer support teams	Value Proposition - Wide selection of accommodations (hotels, apartments, resorts) - User-friendly platform for easy booking - Competitive pricing and deals - User reviews and ratings for informed decisions - Loyalty program and discounts for frequent users	Customer Relation - User accounts for personalized experiences - Customer support via chat, email, phone - Review and feedback mechanisms for continuous improvement - Loyalty programs to encourage repeat business Channels - Online platform (website and mobile app) - Search engine optimization (SEO) - Digital marketing (social media, email campaigns) - Partnerships with travel agencies and other online platforms	Customer Segments - Travelers (individuals and groups) - Business travelers - Hotel owners and managers
Cost Structure - Technology development and maintenance - Marketing and advertising expenses - Customer support costs - Partnership and collaboration costs			Revenue Streams - Commission from hotel bookings - Premium listings and advertising for hotels - Partnerships and collaborations with other travel-related services	

Booking.com (Figure 81) exemplifies a layer player in the tourism industry through its role as an intermediary connecting travelers with a diverse array of accommodations globally. Operating as an aggregator platform, Booking.com facilitates seamless transactions without owning the listed properties. Its commission-based model, global reach, and integration of user reviews make it a dominant force in online travel, showcasing the effectiveness of the layer player concept. However, as a two-sided platform, Booking.com also shares some typical properties of a market maker, which are discussed below (see 7.2.1.4).

7.2.1.2 Integrator models

Companies adopting the integrated model offer a fully integrated suite of services, often maintaining control over the entire travel value chain. Full-service travel agencies, resort chains, and integrated ski resorts embody this comprehensive approach. Features include complete control over the end-to-end travel experience and loyalty programs that span across various services. Characteristic processes involve meticulous destination planning, itinerary design, and cross-promotion strategies, creating a seamless and interconnected experience for travelers. TUI Group stands out in this category, providing not only accommodation and flights but also operating its own cruise and hotel brands. Similarly, ski resort operators such as Vail in Andermatt or Weisse Arena Group in Flims Laax Falera not only offer ski lifts and accommodations but also manage ski and snowboard schools, restaurants, hotels, events, and entertainment facilities as part of an integrated guest experience.

Figure 82: Business model canvas of TUI AG (based on analysis of tuigroup.com)

Key Partners • Airlines for transportation services • Hotels and resorts for accommodations • Local tour operators for excursions and activities • Travel agencies for distribution	Key Activities • Destination planning and management • Marketing and advertising campaigns • Customer service and support • Flight operations and logistics • Hotel and resort management	Value Proposition • Comprehensive travel services (package holidays, flights, hotels, cruises) • Diverse destination options • End-to-end customer experience • Quality and reliability • TUI as a trusted brand in the travel industry	Customer Relation • Online booking and self-service options • Customer support through various channels (phone, email, chat) • Loyalty programs and reward systems • Personalized service for special occasions and preferences	Customer Segments • Leisure travelers • Families • Couples • Business travelers (TUI also operates TUI Business Services)
	Key Resources • Fleet of aircraft (for TUI Airlines) • Network of hotels and resorts • IT infrastructure for online platforms • Skilled workforce (travel agents, customer support, tour guides)		Channels • TUI website and mobile app • Physical travel agencies • Call centers for customer support and bookings • Partnerships with travel agents and online platforms	
Cost Structure • Operating costs for flights and transportation • Hotel and accommodation contracts • Marketing and advertising expenses • Employee salaries and training • Technology and IT infrastructure costs			Revenue Streams • Sale of package holidays • Airline ticket sales • Hotel bookings • Cruise bookings • Ancillary services (travel insurance, airport transfers, excursions)	

Figure 83: Business model canvas Vail Resorts, Inc. (analysis based on vailresorts.com)

Key Partners - Local authorities and inhabitants - Local suppliers and businesses - Regional and national tourism organizations - Travel agencies and tour operators	Key Activities - Slope maintenance and snowmaking - Ski lift operations and safety - Ski and snowboard lessons and programs - Event planning and execution - Marketing and ad campaigns - Guest services and hospitality operations	Value Proposition - Access to diverse and well-groomed ski slopes - Quality ski and snowboarding facilities - Scenic mountain views and natural surroundings - Family-friendly activities and services - On-site amenities (restaurants, lodging, retail) - Events and entertainment (competitions, festivals)	Customer Relation - Direct interaction with guests along the visitor journey - Customer acquisition through epic pass network - Activation through events and social media	Customer Segments - Season pass holders and repeat visitors - Owners of holiday properties in the resort - Families and individuals seeking an alpine holiday experience - Ski and golf tourists
	Key Resources - Nature and cable car facilities for accessibility - Skilled staff for operations of year-round resort - Network with global epic pass holders - Contracts with distributors and other partners		Channels - Online bookings and ticket sales - On-site ticket booths and information centers - Collaboration with travel agencies and tour operators - Social media, digital marketing, and the official website for promotion	
Cost Structure - Maintenance of physical infrastructure (on mountain; village) - Salaries for staff - Marketing activities - Further development of resort			Revenue Streams - Bookings: Revenue from hotel guests - Spending: Revenue from restaurant/bar guests - Ticket Sales: Revenue from individual and group ticket sales - Sale of property in the resort	

TUI Group (Figure 82) operates a highly integrated business model in the tourism industry, providing end-to-end travel services. Through vertical integration, TUI owns and manages airlines, hotels, and cruises, ensuring a seamless travel experience for customers. The group's digital platform serves as a one-stop-shop, allowing travelers to book flights, accommodations, and activities effortlessly. TUI's holistic approach extends from comprehensive branding to destination services, creating a unified and recognizable travel experience. With a focus on owning key components of the travel value chain, TUI offers customers a cohesive and well-coordinated journey, distinguishing itself as a leader in the integrated tourism sector.

Similarly, Vail Resorts (Figure 83) excels with an integrated business model in the tourism industry, offering a complete mountain resort experience. With ownership of renowned ski resorts across continents (mainly North America, but also Europe and Australia), accommodations, ski schools, and diverse guest services, Vail ensures a seamless and coordinated journey for visitors. The introduction of the Epic Pass provides convenient access to multiple resorts, showcasing a commitment to streamlined ticketing and customer retention. The company's digital integration, consistent branding, involvement in real estate development, as well as lodging, dining and entertainment further contribute to a cohesive guest experience. Besides the two Swiss resorts of Vail Resorts, Andermatt and Crans Montana, Weisse Arena Gruppe in Laax is pursuing a business model, which is very similar to the one of Vail Resorts (except for Vail's international network).

Figure 84: Business model canvas Europa-Park GmbH & Co Mack KG (based on analysis of europapark.de)

Key Partners - Affiliation with travel agencies and tour operators for group visits - Collaborations with hotels and accommodation providers in the surrounding area - Partnerships with food and beverage vendors within the park	Key Activities - Theme park operations, including rides/attractions - Entertainment shows and performances - Hospitality services such as (themed) hotels - Marketing and promotion of as a premier theme park - Event planning for festivals	Value Proposition - Diverse and immersive theme park experience - High-quality entertainment and shows - Themed accommodations for an extended stay - Special events and promotions throughout the year	Customer Relation - Direct interactions with guests during their visit - Customer support for inquiries and assistance - Membership or loyalty programs for repeat visitors	Customer Segments - Families and individuals seeking a theme park experience - Tourists visiting the region - School groups and organized tours - Season pass holders and repeat visitors
	Key Resources - Amusement rides and attractions - Skilled staff for park operations, entertainment, and customer service - Technology infrastructure for ticketing, online bookings, and park management - Real estate for park/hotels		Channels - Online platform (Airbnb Online ticket sales and bookings - On-site ticket booths and information centers - Collaboration with travel agencies and tour operators - Social media, digital marketing, and the official website for promotion	
Cost Structure - Park maintenance and safety operations - Staff salaries and training - Marketing and promotional activities - Regular maintenance and upgrades to attractions - Entertainment production costs			Revenue Streams - Ticket sales for park admission - Accommodation bookings - Food and beverage sales within the park - Merchandise sales (souvenirs, themed products) - Special event tickets and promotions	

Europa-Park (Figure 84) stands as an integrator in the tourism industry by seamlessly curating a diverse and immersive theme park experience. Beyond thrilling rides, the park integrates themed accommodations, shows, spas, and dining options, providing visitors with a cohesive and comprehensive journey (similar to Disneyland). Via strategic collaborations with local partners and travel agencies, Europa-Park becomes an integral part of broader travel itineraries. The park's commitment to continuous innovation, events, and loyalty programs further solidifies its role as an integrator, actively shaping a dynamic and engaging tourism destination that goes beyond traditional theme park boundaries.

7.2.1.3 Orchestrator models

Entities following the orchestral model are characterized by their coordination and integration of multiple (third-party) products and services under a unified experience or brand. The model emphasizes the creation of themed experiences and storytelling to elevate customer engagement. Operationally, activity scheduling and production planning are integral, ensuring a cohesive travel experience. Additionally, comprehensive event management processes are employed for special occasions, further enhancing the overall customer experience. In tourism, any destination management organization that integrates various products and services into packaged destination experiences acts as an orchestrator. Furthermore, specific companies, usually with a focal role in their specific field, can play an orchestrating role.

Figure 85: Business model canvas of MSC Cruises S.A. (based on analysis of msccruises.com)

Key Partners • Travel agencies and online travel platforms • Port authorities and destination management organizations • Suppliers of goods and services for onboard offerings • Marketing and promotional partners	Key Activities • Cruise planning and itinerary development • Ship operations and maintenance • Marketing and promotional activities • Customer service and support • Innovation in onboard experiences	Value Proposition • Sea cruise experiences • Convenient packages with classic destinations and/or exclusive excursions	Customer Relation • Pre-cruise information and booking support • Onboard services and customer care • Loyalty programs and incentives for repeat cruisers • Social media engagement for customer interaction and feedback	Customer Segments • Leisure travelers seeking cruise vacations • Families • Couples • Travelers interested in themed cruises (e.g., luxury, cultural, adventure)
	Key Resources • Fleet of cruise ships • Skilled workforce (crew, hospitality, entertainers) • Reservation and booking systems • Marketing and branding assets • Relationships with travel agencies and partners		Channels • Direct sales through the MSC Cruises website and reservation system • Travel agencies and online travel platforms • Marketing and advertising through various channels	
Cost Structure • Ship acquisition, operation, and maintenance costs • Marketing and advertising expenses • Employee salaries and training • Technology infrastructure and reservation system costs • Port fees and fuel costs			Revenue Streams • Ticket sales for cruises • Onboard spending on services and amenities • Shore excursions and additional activities • Merchandising and souvenirs • Partnership and sponsorship arrangements	

MSC Cruises (Figure 85) adopts the role of an orchestrator in the tourism industry by offering comprehensive cruise packages that encompass accommodations, dining, entertainment, and transportation. With a global presence and diverse destination offerings, MSC coordinates various travel services, collaborating with airlines, hotels, and local operators. The company actively shapes the passenger experience by orchestrating onboard entertainment, activities, and logistical aspects, ensuring a seamless and enjoyable cruise. Combining pre-planned packages with customization options, MSC leverages technology to enhance coordination and efficiency, serving as a central coordinator for travelers seeking well-curated and diverse cruise experiences. However, when focusing on the cruise-trip itself, MSC Cruises acts more like an integrator (see 7.2.1.2) by providing a full experience including transport, hotel, food and beverages, entertainment, and even owning entire destinations such as an island in the Bahamas.

The Swiss Museum of Transport (Figure 86) stands as a tourism orchestrator through its multifaceted approach. Not only does it curate diverse exhibits showcasing transportation history, but it also collaborates with specialized partners like gastronomy partner ZFV for restaurant operations as well as conferencing packages. Furthermore, it integrates an art museum as well as various virtual Red-Bull sports through applications (like VR cliff diving or a virtual climb on the Matterhorn). Offering educational programs, hosting events, and maintaining a strong digital presence further underscore its role as an orchestrator. By ensuring consistent branding and forming collaborations with tourism entities, the museum creates a unified and engaging experience, guiding visitors through a comprehensive journey of Swiss transportation history.

Figure 86: Business model canvas of the Association of the Swiss Museum of Transport (based on analysis of verkershaus.ch)

Key Partners - Government entities: Collaboration with government bodies for funding and support - Third-party content providers like Red Bull or the other museums - Tourism boards: partnering with tourism boards for promotional activities - Educational institutions: collaborating with schools and universities for educational programs	Key Activities - Exhibit curation: curating and maintaining a diverse range of exhibits showcasing various modes of transportation - Educational programs: doing programs, workshops, and guided tours for visitors - Event hosting: organizing events, conferences, and special exhibitions Key Resources - Skilled staff for museum operations, entertainment, customer service - Technology infrastructure for ticketing, online bookings, and facilities management - Real estate for museum facilities	Value Proposition - Transport heritage: showcasing the rich history of Swiss transportation modes, including trains, planes, automobiles, and maritime transport - Interactive exhibits: offering engaging and educational exhibits for visitors of all ages - Cultural experience: providing a cultural and historical experience focused on Switzerland's transport evolution	Customer Relation - Direct interactions with guests during their visit - Customer support for inquiries and assistance - Membership or loyalty programs for repeat visitors	Customer Segments - Tourists: visitors interested in exploring Swiss transportation history - Families: providing family-friendly exhibits and activities - School groups: educational programs catering to students and teachers
			Channels - Museum website: platform for info, ticket bookings, event updates - Ticket counters: on-site ticket sales and information desks - Tour operators: collaboration with tour operators for group visits	
Cost Structure - Museum maintenance and safety operations - Staff salaries and training - Marketing and promotional activities - Regular maintenance and upgrades to attractions - Entertainment production costs			Revenue Streams - Ticket sales for admission - Accommodation bookings - Food and beverage sales within the museum - Merchandise sales (souvenirs, themed products) - Special event tickets and promotions	

Similarly, the Ballenberg Swiss (Figure 87) open-air museum excels as a tourism orchestrator by seamlessly combining diverse experiences to create a captivating visitor journey. Through strategic partnerships with Gehri-Food GmbH, Kurszentrum Ballenberg, and Landschaftstheater Ballenberg, the museum extends beyond traditional exhibits. This orchestrated approach, offering culinary delights, craft courses, and theater productions, caters to a varied audience. Centralized channels, unified branding, and revenue diversification further highlight its orchestrator role. By engaging with the local community and fostering a sense of unity, Ballenberg Swiss open-air museum ensures a holistic and memorable tourism experience.

Figure 87: Business model canvas of the Ballenberg Swiss open-air museum (based on analysis of ballenberg.ch)

Key Partners • Tourism boards and agencies • Educational institutions • Local cultural organizations and associations	Key Activities • Museum exhibits/displays • Preservation of historical buildings • Educational workshops and events	Value Proposition • Living history experience • Preservation of Swiss cultural heritage • Educational and entertaining exhibits	Customer Relation • Guided tours and interpretation • Educational programs for schools • Interactive exhibits	Customer Segments • Tourists • School groups • History and culture enthusiasts
	Key Resources • Historical buildings and artifacts • Skilled staff/guides • Outdoor facilities		Channels • Ticket sales at entrance • Online booking platforms • Collaborations with travel agencies	
Cost Structure • Maintenance of historical buildings • Staff salaries and training • Marketing and promotion			Revenue Streams • Entrance ticket sales • Educational program fees • Merchandise sales	

7.2.1.4 Market maker models

Market makers create dynamic marketplaces where diverse services converge. Airbnb (Figure 88) operates as a market maker in the tourism industry by serving as a dynamic marketplace that connects hosts offering accommodation and experiences with travelers seeking unique and personalized options. By expanding the market beyond traditional hotels and creating new economic opportunities for individuals, Airbnb has played a transformative role. It sets standards, prompts industry adaptation, and utilizes a dynamic pricing model, influencing how accommodations are booked and experienced. In essence, Airbnb's platform actively shapes and broadens the tourism market, making it a pivotal player in connecting diverse suppliers and consumers.

Figure 88: Business model canvas of Airbnb, Inc. (based on analysis of airbnb.com)

Key Partners • Hosts providing accommodations and experiences • Travel and tourism organizations • Local governments and regulators • Payment service providers	Key Activities • Matching hosts and guests • Ensuring trust and safety • Marketing and promotion • Continuous platform improvement	Value Proposition • Diverse and unique accommodations • Local and personalized experiences • Cost-effective lodging options • Platform for hosts to earn income • User-friendly booking and payment system	Customer Relation • User reviews and ratings • Customer support for hosts and guests • Community forums and events • Trust and safety measures	Customer Segments • Travelers (tourists, business travelers) • Hosts (individuals offering accommodation) • Experience providers (offering local experiences)
	Key Resources • Technology platform and website • Database of hosts and accommodations • Brand and reputation • Trust and safety measures		Channels • Online platform (Airbnb website and mobile app) • Marketing and partnerships • Host and guest referrals	
Cost Structure • Technology development and maintenance • Marketing and advertising • Customer support and trust measures • Legal and regulatory compliance			Revenue Streams • Service fees from hosts and guests • Host fees for additional services (e.g., photography, cleaning) • Business travel services	

Uber (Figure 89) functions as a market maker in the travel industry by seamlessly connecting the demand for transportation (riders) with the supply of services (drivers) through its dynamic platform. Going beyond traditional taxi services, Uber provides diverse transportation options, responding to fluctuating market conditions with dynamic pricing. This innovative model disrupts and transforms the industry, creating economic opportunities for local drivers. With a customer-centric approach and global reach, Uber's technological prowess ensures a unified marketplace that shapes and enhances the overall travel experience. In essence, Uber actively shapes and responds to market dynamics, establishing itself as a key player in the tourism ecosystem.

Similarly, LocalBini (Figure 90) combines tourists with local suppliers of travel experiences. It acts as a market maker in the tourism industry by connecting two parties through its platform. The commission-based model facilitates transactions, creating a vibrant marketplace that expands beyond traditional tourism. By setting new standards for authentic and personalized experiences, LocalBini influences industry dynamics, prompting adaptation among traditional players. The platform's emphasis on community, cultural exchange, and sustainable tourism further contributes to its role as a market maker, actively shaping and broadening the tourism landscape.

Figure 89: Business model canvas of Uber Technologies Inc. (analysis based on uber.com)

Key Partners • Drivers: Independent contractors providing services • Payment Providers: Partnerships for secure transactions • Businesses: Collaborations for corporate solutions • Mapping Services: Integration with navigation providers	Key Activities • Matching: Algorithm-driven pairing of riders and drivers • Quality Control: Monitoring and maintaining service standards • Driver Acquisition: Recruitment and onboarding • Marketing: Promotion to attract users	Value Proposition • Convenience with on-demand transportation • Affordable pricing for various travel options • Reliability with predictable arrival times • Cashless transactions through the app	Customer Relation • User Ratings: Feedback system for drivers and riders • Customer Support: In-app assistance for users • Promotions: Discounts, promotions, and loyalty programs	Customer Segments • Riders seeking convenient transportation • Drivers providing transportation services
	Key Resources • Technology Platform: App and algorithms for matching • Fleet: Access to a network of independent drivers • Data: User data for analytics and service improvement • Brand: Recognizable and trusted brand		Channels • Primary platform: Mobile app for riders and drivers. • Secondary platform: Website for information and support. • Collaborations: Partnerships with businesses and events.	
Cost Structure • Driver Payouts: Payments to drivers for services • Marketing and Promotion: Advertising to attract users • Technology Development: App maintenance and updates • Regulatory Compliance: Costs for legal requirements			Revenue Streams • Ride Fees: Charges based on distance and time • Surge Pricing: Dynamic pricing during peak hours • Delivery Fees: Charges for Uber Eats and other services • Advertising: Potential revenue from in-app advertisements	

Figure 90: Business model canvas of LocalBini AG (based on analysis of localbini.com)

Key Partners • Locals providing experiences • Travel and tourism organizations • Local governments and regulators • Payment service providers	Key Activities • Curating and onboarding experiences and hosts • Marketing and promoting experiences to travelers • Ensuring a seamless booking and payment process • Community engagement and feedback collection	Value Proposition • Curated and authentic local experiences • Flexible, on-demand booking for personalized adventures • Connection with locals who share similar interests • Support for sustainable tourism practices	Customer Relation • User reviews and ratings for experiences • Customer support for hosts and travelers • Community forums and events for engagement • Newsletter and communication channels	Customer Segments • Travelers seeking unique, authentic experiences • Local Hosts passionate about sharing their expertise • LocalBini Team facilitating platform operations
	Key Resources • Technology platform and website • Database of experiences and hosts • Brand and reputation • Marketing and community-building efforts		Channels • Online platform (LocalBini website and mobile app) • Marketing and promotional campaigns • Community engagement through forums and events	
Cost Structure • Technology development and maintenance • Marketing and advertising expenses • Customer support and community management • Legal and regulatory compliance			Revenue Streams • Commission fees from every transaction on the platform • Premium membership for enhanced features • Partnerships and sponsorships with local businesses	

7.2.2 Business model by type of pattern

As introduced above, business models can also be differentiated by other characteristic elements than their value creation properties. Many of these patterns are based on differences in value proposition and value capture. This section presents a taxonomy focused on (digital) business models in the tourism sector. The authors adopted a qualitative approach and identified a total of 53 different types of business models, with some configurations appearing more often in their explorative search (Perelygina et al., 2022). They link their taxonomy of digital business models in the travel industry (see Perelygina et al., 2022, p. 6) to existing pattern labels from literature (e.g., 55 patterns by Gassmann et al., 2014; e.g., 71 types by Taran et al., 2016).

Table 30: Digital business model configurations in the travel sector, descending by frequency of appearance (Perelygina et al., 2022, pp. 6, 8)

Configuration	Alternative labels in existing literature	Example companies	V*
Online Travel Agency (OTA) (Sub-types: Merchant/Agent)	E-shop ¹	Expedia; Booking.com; Yatra; MakeMyTrip; Travelata; etc.	B
Affiliate (Lead Generator)	Brokerage ¹	Travel Noire; OneDollarTrips; Y Travel Blog; etc.	A
Online Travel Marketplace (OTM)	E-mall ¹ , Shop in Shop ²	WeTravel; Get Your Guide; Viator; TourRadar; Klook; etc.	B
Facilitator (Solution Provider)	Value Chain Service Provider ¹ , Layer Player ²	YouLi; TripHero	A
Metasearch Platform	Comparison shopping ³	Skyscanner; Trivago; Momondo; GDX; Rome2Rio; etc.	A
Display Advertising	Advertising ⁴	Conde Nast Traveler	D
SaaS	Software-as-a-Service ⁵	Hotailors; Bókun; FareHarbor; Sift Science; Peakwork; etc.	A
E-commerce	Digitization and E-commerce ²	Melbourne Observation Wheel; Lake Constance DMO	B
Sharing Platform (P2P Platform)	Peer-to-Peer ^{1,2}	BlaBlaCar; Grab; AirBnB; GetMyBoat; JetSmarter; Uber; etc.	A
Mass Customization (Dynamic Packaging)	Mass-customized Commodity ¹ , Mass Customization ²	X-TUI; Hotelplan; Holidays.ch; Lufthansa Holidays; etc.	A
Subscription (Membership)	Subscription ^{1,2}	SkyHi; Bidroom; FinalPrice	D
White Label	White Label ^{1,2}	TRAVELfusion	B
Cross-selling (Cross Bundling)	Cross-selling ²	Frontier Airlines	A
Expertise Monetization	Inside-out ¹	AirHelp; Trivago	A
Infomediary (Content Aggregator)	Infomediary ¹	Trip101; Mezi; National Geographic	A
Turn-key Solution	Full Service Provider ¹	CarTrawler; Habashwe Africa	A
Meta-booking Platform	–	TripFactory; Rentalcars.com; GoEuro; Reservamos	A
Modular Solution	Modular Producer ⁶	Autobooker; Destygo; Cangooroo (Juniper)	A
Customer Data Monetization	Leverage Customer Data ²	–	B
Disintermediation	Disintermediation ¹ , Direct Selling ²	Marriott; Qantas; Lufthansa	B
First Discoverer	Breakthrough Markets ¹	Trivago	E
Club (Small Niche)	–	Russian Expeditions; Eclipse Traveling; Vawaa; Altourism	E
Custom Content	–	The View South; TravIndi	A
On-the-go (Mobile First)	–	HotelTonight	A
Affiliate Network	–	Travelpayouts	C

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Configuration	Alternative labels in existing literature	Example companies	V*
Travel Commerce Platform	–	go global; instant travel; Travelfusion; Travolutionary; etc.	A
Unsold (Distressed) Inventory	Distressed Inventory ³	Daycation; HotelsByDay; SeatFrog	B
Crowd Sourcing	Crowd Sourcing ^{1,2}	Atlas Obscura; Google Maps; TripAdvisor	A
Analytics and Connections	–	PhocusWright; Skift; Arival	E
Virtual Community	Virtual Community ⁷	TripTogether; TravelMassive	E
Expense Management	–	Deem; SAP Concur; GetThere by Sabre; Lola; Rocketrip	A
Ecosystem Creator	Adaptive ¹ , Open Business ²	LeezAir	C
Crowd Investing / Crowdfunding Platform	Multi-sided platforms ¹ , Two-sided Market ²	we4tourism; TravelStarter	C
Trusted Service Leader (Big Players)	Trusted Product/Service Leader ¹ , Customer Loyalty ²	TUI	A
No Win, No Fee	–	AirHelp; Compensair; RefundMyTicket; Pruvo; etc.	D
Edufication	–	Center Smart Tourism	A
Accelerators / Incubators	Business Incubators ⁸	Chan Brothers; Booking Booster; Propeller Shannon	C
Independent Consultant	Trusted Advisor ¹	TravIndi; Travel Tech Consulting Inc.	A
Barter	Barter ^{1,2}	The Travel Leaf; That Travel Blog	D
Rent Instead of Buy	Rent Instead of Buy ²	Mytripphoto	A
License	Licensing ²	Wcities	A
Low-coster	No Frills ^{1,2}	Oyo Rooms; CheapTrip	A
Freemium	Freemium ^{1,2}	Free Walking Tours Melbourne	D
Ultimate Outsourcing	Core Focused ¹	G Adventures	B
Affinity Club	Affinity Club ¹ , Customer Loyalty ²	Rocketmiles; LTM group; Travel Pool	C
Deal of the Day (Daily Deal)	Revenue Sharing ²	TravelBird; Secret Escapes; Travelzoo	C
Open Access / Open Source	Open Source ²	Flio	C
Self-service	Self-service ^{1,2}	Keesy	B
Gamification	Gamification ⁹	Adventure Junky; Stray Boots, Questo	A
Hidden Advertising	Embedded Advertising ⁹	Maps.me	D
Auction	E-auction/Auction ¹ , Auction ²	Room Auction	D
Venture Capitalists	Venture Capital Firms	Thayer Ventures	C
Ultimate Luxury	Ultimate Luxury ¹	Quintessentially Travel; Luxury Link; Virtuoso	E

*Value driver (primary; based on Taran et al., 2016): ^AValue proposition ^BValue configuration ^CValue network ^DValue capture ^EValue segment

Sources of alternative labels (from existing literature)

¹ Taran et al. (2016), business model configurations

² Gassmann et al. (2014), business model patterns

³ Daniele and Frew (2006)

⁴ Rappa (2004)

⁵ Ojala (2013)

⁶ Weill and Woerner (2018)

⁷ Weill and Vitale (2001)

⁸ Grimaldi and Grandi (2005)

⁹ Celaya et al. (2016)

The presented examples are not always unambiguously categorizable. Instead, many companies show characteristics of different business model patterns at the same time. Furthermore, the classification of the 53 patterns based on their primary value driver (column V) could be discussed controversially (Perelygina et al., 2022, p. 7). Nevertheless, taxonomies of patterns like these help analyzing and conceptualizing business models.

7.2.3 Evolving business models

Having a differentiated and thus hard to imitate architecture for value creation is key to establish a competitive advantage (Teece, 2010, p. 180). Business models are not fixed but must evolve over time as markets, technologies and legal structures change (Teece, 2010, p. 177). One such event was the Covid-19 pandemic. The publicly mandated closure of borders and facilities such as restaurants shook up the tourism and hospitality sector in unprecedented ways, forcing operators to either shut down temporarily or adapt to a takeout and delivery model very quickly (Chotigo & Kadono, 2022). This external shock required instant adaptation and produced accelerated testing and release of new business models.

In gastronomy, ghost kitchens or so-called silent kitchens emerged. A ghost kitchen is a company that exclusively cooks for delivery or takeaway services and does not possess a traditional restaurant space for guests. In contrast to conventional restaurants that focus on on-site service, a ghost kitchen concentrates on efficiently preparing food for (online) distribution. It is often located in cost-effective, industrial areas and can either operate its own brand or act as a service provider for existing restaurants looking to expand their delivery capacities. Typically, the restaurant brand exists exclusively in a virtual space. Presentation, orders, and marketing take place on the internet or through ordering apps. For ghost kitchens to function well and efficiently as independent brands, they need appropriate visibility in the market, which, in turn, is not free. Additionally, they require a large catchment area and short delivery distances, which are typically found only in urban areas (Bättig, 2023).

A related approach in gastronomy are so-called production kitchens. Gastronomy brands expanding across multiple locations leverage centralized kitchens to uphold brand consistency. These kitchens produce key components like starch sides, beverage concentrates, sauces, etc., while the final assembly occurs at each specific location. The use of production kitchens streamlines procurement, optimizes inventory and food waste management, reduces costs, and enables more efficient staffing. The implementation of optimized standard operating procedures is an additional benefit of utilizing production kitchens and increases productivity, often relying heavily on digital tools to streamline operations. Canteens and caterers are partly based on similar models. A more recent type of (highly digital or even virtual) canteen-operation is the concept of fridges with fresh and healthy option for cold and reheated meals: A company is producing the meals centrally and delivering them to different client locations, based on customer needs and behaviour (see, e.g., [felfel.ch](https://www.felfel.ch)). Such canteens require significantly less space and – thanks to app-based payments and self-service – reduce the need for personnel.

Similarly, in hospitality, an increased level of digitization and automation has been adopted in the aftermath of the pandemic. Self-service hotels with minimal physical interaction became more widespread. While some of the pandemic effects on business models were temporary, there are some underlying trends, which might not go away or swing back to pre-pandemic states. Above all, this includes technological advancements including AI, helping to increase both customer and service productivity, even in business models with increased levels of self-servicing (see also trends from literature in first part of this report).

7.3 Business ecosystems in tourism and hospitality

In a system view, there is an uncountable number of actors that constitute the tourism experience. However, in today's digitized world, a seamless visitor journey consists of several (partially) connected technical tools and services. The following section therefore focuses on mapping some of the most (practically) relevant IT system providers in Swiss tourism and hospitality as presented in section 7.1 of this report.

The system landscape has been compiled through an exploratory process (cf. 7.1.1). In a first step, the content of existing regional inventories from Grisons (Interessegemeinschaft Tourismus Graubünden, 2021), Valais (Schegg, 2023), Lucerne and others (Golliez et al., 2023) has been collected. In a second step, this collection has been expanded by checking international databases for both industry-specific (such as Skift.com and HotelTechReport.com) and generic (such as Capterra.com and SoftwareAdvice.com) benchmarking. In a third step, this collection has been validated through discussions and documents from experts from practice (from industry partners of this flagship project, such as HotellerieSuisse, Thomann Hospitality Management, ComCierge, and others). As this ecosystem-view is focusing on the technology-backbone, it does not include (local) service providers or consulting and implementation firms. Furthermore, startups in early stage without proven products as well as companies that have been taken over by others have been excluded from the collection. However, it is important to emphasize that the field is evolving quickly. The ecosystem mapping at hand is therefore just a static (early 2024) and non-comprehensive representation of reality of IT in tourism and hospitality, with a strong focus on the travel sector in Switzerland.

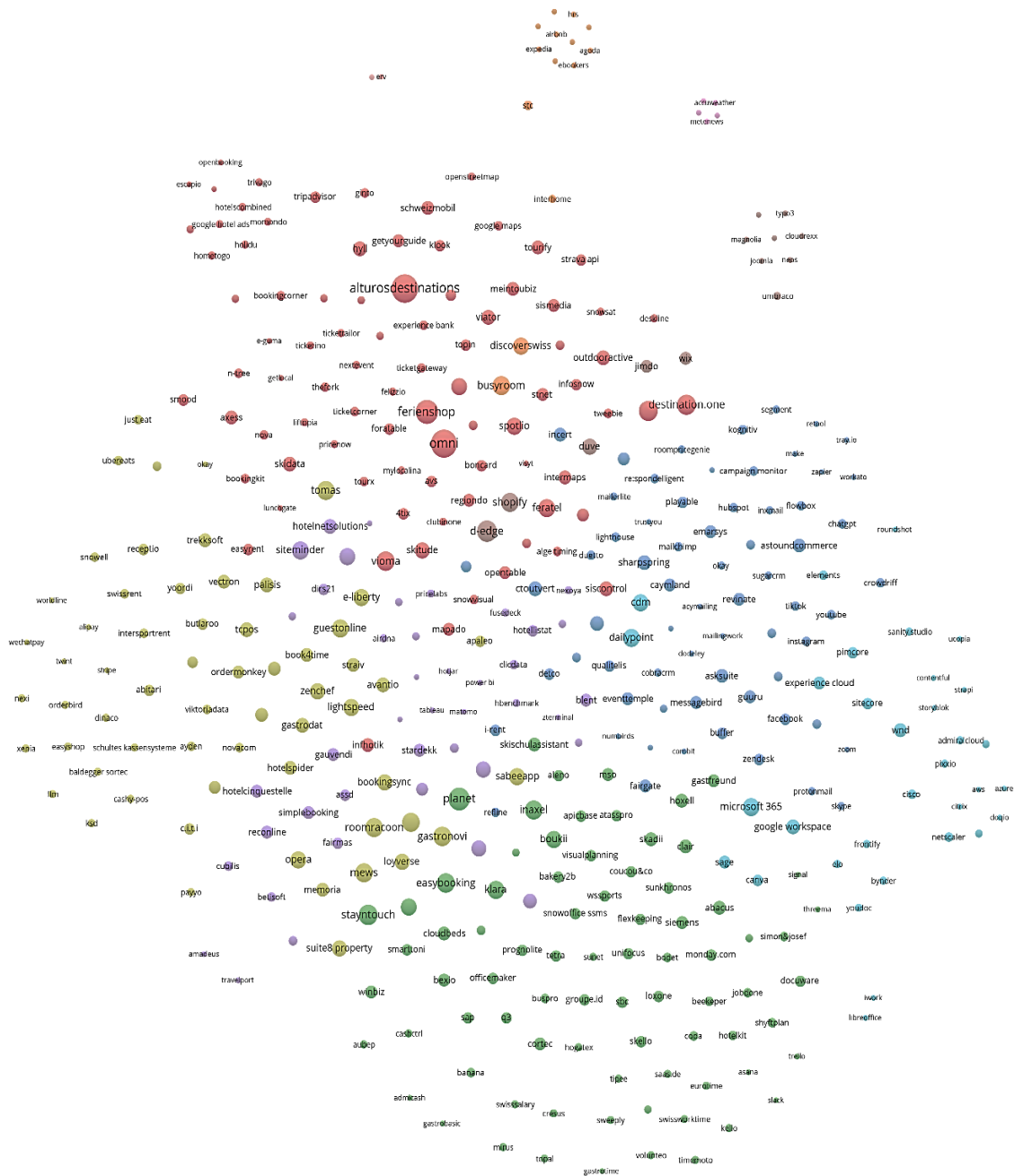
With the help of a cluster analysis, the system landscape can be mapped visually (e.g., based on software from VOSviewer). The map allows for a clustered view of existing solutions in the Swiss tourism and hospitality sector. The density of the map indicates the level of relatedness of the various solutions, which is calculated based on the number of shared functionalities (cf. 7.1.1 and 7.1.2). An overall relatively dense visualization indicates a high level of relatedness or integration of the various tools in use. The high interrelatedness of the resulting cluster analysis complicates the identification of meaningful groups. However, when interpreting the generated map clockwise by starting on the top, the following interpretations are possible (cf. Figure 91): There is

- (1) a cluster of national and international booking platforms,
- (2) a range of data providers,
- (3) a distinct set of generic web tools,
- (4) a broad range of online marketing instruments,
- (5) a suite of digital network and office applications,
- (6) a large set of mostly industry-specific planning and accounting tools,
- (7) a variety of hospitality-focused management solutions,
- (8) a wide range of ordering and payment related applications,
- (9) and a considerable amount of integrated destination management, information, pricing and booking platforms.

All these applications (cf. Table 27) contribute to an integrated, digitized customer journey, both within and across companies and destinations (see also 7.1). Furthermore, they facilitate more digitized business model configurations, with various options regarding value creation and value capture mechanisms (see also 7.2).

Figure 91: Technological ecosystem in Swiss tourism and hospitality

Clustered map of the most relevant solution or tool provider in the system landscape (own visualization, created with VOSviewer)



Legend

The larger the circle (and label), the more functionalities or value propositions per solution or tool provider (minimum = 1, maximum = 25). This map contains 400 of the most relevant solutions for Swiss tourism and hospitality. Due to space limitations, some circles are not labelled. The proximity of circles is related to the number of shared functionalities. The density of the map indicates the level of integration or relation.

Clusters (clockwise, starting from top)

(inter-)national booking platforms, data providers, generic web tools, online marketing instruments, digital network and office applications, (industry-specific) planning and accounting tools, hospitality-focused management solutions, ordering and payment related tools, integrated destination management, information, pricing, and booking platforms

8 Practice excerpts

After the desk-researched based collection of business processes, business models, and ecosystems in (Swiss) tourism and hospitality, the following section contains relevant excerpts from industry partners of this project. During the flagship, various formal and informal exchanges, meetings, workshops, and conferences with different stakeholders have taken place. Besides academic partners from Vaud (EHL), Valais (HES-SO), Lucerne (HSLU), and Grisons (FHGR), this includes representatives from Switzerland Tourism with a selection of regional DMOs, Swiss Federal Railways, Swiss Cableway Association, HotellerieSuisse, GastroSuisse, hospitality professionals such as Thomann Hospitality and ComCierge, as well as IT and data providers such as DiscoverSwiss, Blent, Swisscom, and Intervista.

In the following sections, inputs from practice partners are presented. This collection is not based on a systematic approach (as in the previous chapters), but rather eclectic. The excerpts are sorted by sector of the tourism and hospitality industry, including Hospitality (8.1), Gastronomy (8.2), and Transport (8.3). The collection builds on the observation that many tourism and hospitality enterprises are confronted with low margins and low profitability. Value is insufficiently captured and often lost to intermediaries. In the recent past, many tourism and hospitality processes could only create and capture value because they had access to (too) favorable production factors: There was an abundance of cheap capital and land (low interest rates) and continuous influx of workers, providing cheap labor (low wages).

The aftermaths of the pandemic and demographic changes have deteriorated these circumstances, at least temporarily. Key production factors (land, capital, labor) have become scarce and thus expensive. Therefore, knowledge (or: entrepreneurship) as the fourth production factor, becomes key: Instead of filling existing positions with suitable specialists, processes need to be better aligned with the available and often scarce human and financial resources (design to resources). That way, higher productivity could also be reflected in higher salaries. This entails a review of the service content, including the question of the required or requested service level and related willingness to pay.

However, productivity is a problematic term in tourism and hospitality. The following quotes from a workshop with industry professionals show, that the concept is connotated very negatively: “employees already work really hard”, “tough conditions for workers”, “it squeezes labor”, “service is intangible”, “service is not productive”, “it is evoking a mental image of factories, which goes against concepts like service quality”, “it is seen as a threat to their job by workers”, “it goes against the principles of outstanding client service”, “it is not always possible to measure competencies and related productivity”, “it is hard to measure and some of the actors don’t want to be measurable”, “it might lead to overtourism”.

Despite these perceptions, productivity (if understood correctly) would ideally be positive for both producers and consumers. If a process is digitized in a smart way, it increases both service and customer productivity. This means that both the provider and the client are better off. If done well, increased productivity is about relieving and enabling both employees and customers, not about higher pressure and reduced quality or reduced customer satisfaction. Moreover, processes with personal interactions that trigger a willingness to pay which at least covers the costs of personal interaction are not to be eliminated but strengthened.

8.1 Hospitality

Based on exchanges with hospitality professionals from HotellerieSuisse, Thomann Hospitality, and ComCierge (in 2023 and 2024), a range of current issues in hotel management have been detected. Supposedly, hospitality managers are often fully absorbed by operational tasks of daily business, thereby losing sight of the big picture. According to Thomann, there is a widespread lack of time for holistic developments. Relevant KPIs are online partially identified and rarely consolidated from the various IT systems in place. Due to resource and knowledge constraints, performance is only measured and benchmarked to a very limited extent. Furthermore, Thomann mentions that the sector is often communicating in a negative way, trying to get public support by complaining or ringing the alarm. At the same time, successful companies are hesitant to share their best practices as they fear envy from their peers. This tendency leads to a problematic public perception which might partially explain the lack of appeal to young professionals. However, these deficits could easily be mitigated by adopting state-of-the-art indicators that allow for detailed measurement and continuous improvement.

Table 31: Selected indicators for hospitality leadership (based on input from Thomann Hospitality, 2023)

Area (results)	Indicators (specific examples)	Perception (by target group)
Customer-related	response time, failure rates	accessibility and quality
Employee-related	staff turnover and participation in improvement teams	career opportunities and equal opportunities
Society-related	awards, sponsorship of social or ecological projects	image as an employer and transparency
Core-related	lead times, value of intellectual capital	profitability, market share

Thanks to increasingly digitized processes, more and more service elements can be measured and monitored automatically. Based on HRM, ERP and property management systems, detailed operational figures can be pulled. Based on this, strategic decisions on the allocation of resources are facilitated. This could for example include replacing labor with capital in the form of robotics and automation, outsourcing activities, or delegation to the customer. More extreme examples include fully digitized hotels and guest journeys without on-site staff or digital self-check-in at kiosks or robots. If necessary, the hotel bar or bistro could still assist guests in the (digital) check-in process. The following list contains exemplary digital controlling systems for hotels, which allow for continuous operational optimization, but also for more fundamental strategic renewal.

Table 32: Selected indicators for labor utilization in hospitality (based on workshop with Thomann Hospitality, 2024)

Area (activity)	Indicators (RevPAR = Revenue per Available Room)	Unit (h = hour, m2 = square meter, CHF = Swiss Franc)
Housekeeping	Labor per room sold	h or CHF
	Labor per RevPAR (or average daily rate, ADR)	h or CHF or %
Reception	Labor per reservation (bookings, across all channels)	h or CHF
	Labor per check-in/-out (per arrival)	h or CHF
	Labor pro night	h or CHF
Maintenance/Repairs/Replacements	Labor per m2 (by category and/or by occupancy)	h/m2

Table 33: Controlling scheme for capital utilization in hospitality (based on workshop with Thomann Hospitality, 2024)

Area (department)	Explainer (of KPI element)	Unit (m2=square meters; GOI=gross operating income)
+ Rooms	sleeping; transient, <3 months; by room category	GOI/m2
+ F&B	catering; external/internal; production/consumption	GOI/m2
+ Minors	wellness, fitness, etc.	GOI/m2
+ Living	residential; resident, >3 months	GOI/m2
+ Retail	shops	GOI/m2
= TOTAL		
– Overhead	admin, marketing, maintenance; indirect expenses	
= GOP	Gross Operating Profit (GOI – indirect expenses)	GOP/m2 (GOI = income – direct expenses)
– Property expenses	insurance, rental, etc.	
= EBITDA	earnings before interest, tax, depreciation, amortization	
– D and A	depreciation (tangible) and amortization (intangible)	
= EBIT	earnings before interest and taxes	
– I	interest (financing expenses)	
= EBT	earnings before taxes	

Besides optimizing business processes and business model of a specific hotel company, it makes sense to also adopt an ecosystem perspective. There have been pilots in Ticino and Grisons to share employees between hotels with winter and summer peak seasons. Furthermore, there are concepts with shared IT and support services (including night reception and concierge services), thereby expanding the availability around the clock. Hotels could also take over third-party processes in order to exploit synergies by, e.g., providing a hub for holiday apartments in the region. A more radical form would be a fully hybrid hotel, where the services and amenities (lobby, laundry, refrigerators, safe, daycare, kitchen, etc.) are used by guests and the local community alike. The services could be reserved, booked, paid for and evaluated via a platform. Vice versa, hotels could virtually integrate services from other companies into their offering, such as different gastronomical experiences.

These insights and ideas have been gathered in workshops and conversations with various stakeholders from the hospitality industry (e.g., at conferences of this flagship project). These talks have shown that digitization has arrived in most hotels and permeated many processes. However, its potential for data-based decision-making is not fully exploited yet. Many companies in the fragmented hotel sector are gathering and evaluating their operational KPIs only insufficiently. This is not only problematic on a business process level. A lack of current and relevant data prevents these companies from systematically monitoring and innovating their business models. Furthermore, it prevents them from well-founded decision-making regarding strategic questions including the business ecosystem scope, which spans across individual firms and offers potential for synergies and optimizations across the travel and tourism sector (cf. next sections).

8.2 Gastronomy

Concluding from a workshop with GastroSuisse (in 2023), the following pain points are not fully addressed, adopted or accepted yet, but could be solved with the help of IT. Many restaurants would like to charge reservation fees for no-shows, to ensure full utilization of their capacity. Moreover, reservation management with optimal table occupancy still is a challenge. Furthermore, transparent tip splitting is an issue for both employees and guests in times of increased digital payments. Lastly, comprehensive meta-platforms for managing the full range of restaurants' online presences regarding offerings, images, videos, feedback management, etc. are not perfect yet. At the same time, there are various promising solutions which have been emerging lately. They allow for more efficient processes and business models in gastronomy (see Table 34).

Table 34: Business process and model innovations in gastronomy (based on input from GastroSuisse, 2023)

Explanation of business process or model optimization	Specific example or solution
Vending machines	e.g., Selecta
Ordering kiosks in fast casual and takeaway restaurants to increase upselling and save personnel	e.g., McDonalds
Orders placed through tablets or so-called ordermen (result in less walking and fewer errors in orders)	e.g., Weisse Arena Gruppe
Payment in restaurants via QR code	e.g., Miss Miu
Reservation management that enables fully automated seating and table optimization in a restaurant	e.g., reservaurant.com
App for reservation, ordering, and payment in one	e.g., foratable.com
Promote online marketing, such as social media, as a source to gain more reach	Instagram, etc.
Software that measures plate waste per menu by using AI	nutrai; ktiro.ch
Data-driven menu planning tool including AI for restaurants	perspective-food.com
Official app with all local restaurants/hotels, where you can book and view the status of reservations	
Collaboration between providers in a tourism region for infrastructure sharing	
Central production kitchen for an entire destination	
Catering lab where new products and services can be developed	
Online training platform for in-house training courses for companies	

Many of the listed optimizations can be seen as technology-supported (re-)delegations of individual processes to customers by applying self-service technology. Furthermore, it is about the automation and robotization of entire processes, e.g., internal and external billing or cooking processes. Furthermore, efficiency can be increased by executing various interpersonal processes centrally in one place and by the same personnel. This includes the cross-operational centralization of processes, e.g., with central (large) kitchens or supply and disposal services. Another approach would be the taking over of third-party processes in order to exploit synergies across organizations, such as (g)host kitchens for multiple brands or restaurants.

Overall, the pandemic has accelerated the spread of digitally enabled processes from fast food to other restaurant types. It seems that the acceptance has increased, at least in cases where both service and customer productivity are improved, e.g., thanks to reduced waiting times and easier payment. However, the emphasis is mostly on process optimization, and less on a business model or even business ecosystem level. There is still potential for improvements and innovation at these higher levels, which go beyond single process steps and individual firms.

8.3 Transport

Thanks to AllianceSwisspass and the highly integrated public transport system in Switzerland, trains, buses, trams, and even boats as well as mountain railways and cable cars provide a mostly digitized and seamless travel journey. Based on the Swiss interval timetable and apps such as SBB Mobile and EasyRide, mobility as a service is a very convenient reality in Switzerland. Nevertheless, there are some opportunities for improvement, which have been identified in talks with stakeholders and partners of this flagship. The following list contains a number of ideas and concepts for further digital integration of business (and customer) processes as well as business models in the Swiss travel and tourism ecosystem.

Table 35: Business process and model innovations in transport (based on input from various project partners, 2024/2025)

Explanation of business process or model conceptualization	Specific example or solution
Integrating the sale of ski tickets in the SBB app and SwissPass	cf. Snow'n'Rail
Expand bundling of public transport with activities to more areas	cf. SOB Loipenhit, SBB Railwayay
Combine outdoor experiences (hiking, cycling, skiing, etc.) with F&B and accommodation	cf. SchweizMobil
Improve luggage transport for train travelers with direct delivery to the hotel (same day)	cf. SBB Gepäcktransport
Bundle overnight stays with public transport and/or local cable car access	cf. ÖV inklusive
Boost subscription models for leisure offerings to loyalise customers	cf. MagicPass
Single guest account for all tourism services and registrations in Switzerland; guests can allow to transfer all needed data to selected service provider; data will be cleaner which saves service providers time	cf. DiscoverSwiss
Allow for tracking and mapping of tourist journeys to optimize products and services along the route and also allow for more personalized experiences	
Liaise all players in one region or destination for cross-selling and selling from multiple points, e.g. by booking accommodation with transport and excursions	
Provide all-inclusive offerings (e.g., with different service or accessibility levels or times) for leisure trips to simplify the customer journey across companies	

Regarding business process efficiency, the transportation sector is highly digitized already as this is a necessity in a system with dense intervals and capacity limits in peak hours. Furthermore, due to increased customer expectations and climate change, highly efficient resource management is key, especially for cable car companies with winter operations. Snow making and grooming of slopes is IT-heavy today (with systems from TechnoAlpin and/or DemacLenko, as well as satellite-based groomers). However, as the table above shows, there is still room for more cross-company optimization along the customer journey.

By understanding the patterns of visitor flows within destinations and across regions, digitally enabled business processes could be tailored to specific touch points of the journey. By adopting the travelers' perspective on a tourist ecosystem level, more integrated offerings could be conceived. Based on business processes in the transport sector which are highly digitized already, there is potential for further business model and ecosystem innovation across firm boundaries and along the tourist journey.

9 Practice review conclusion

The second part of this report provides an overview and integration of three main concepts of the second subproject of this flagship on resilient tourism: business processes, business models, and business ecosystems. After a theoretical introduction of the concepts, an empirical collection with a focus on the practice in tourism and hospitality is presented. The report builds on the preceding (first) part and combines both a process and system perspective while providing the basis for subsequent, more conceptual work.

After definitory sections on key concepts from literature, this second part of the report includes blueprints of business processes and maps of business models that are applied in the tourism and hospitality ecosystem. It gathers frameworks, typologies and taxonomies that support the identification of opportunities for workflow automation and integration with digital tools in tourism. In combination with typical visitor flows and related touchpoints, this provides ground for the development of digitally enabled business model configurations in the tourism and hospitality ecosystem, that are supported by data and technology.

On the micro-level, this report adopts a business process view, introducing concepts such as customer journey, service blueprint, and value chain. The empirical overview of digitally enabled processes in tourism and hospitality is based on a mapping of 400 widely adopted applications in Switzerland with 60 different functionalities and up to 25 value propositions per tool. On the meso-level, the report focuses on business models, providing different definitions and typologies based on value creation and value capture logics. These different models are illustrated by a collection of typical cases from tourism and hospitality, both from Switzerland and abroad, some with highly digitized models, others less so. On the meta-level, the report provides a business ecosystem view of the (IT-based) environment in tourism and hospitality. The analysis shows distinct topical clusters around booking platforms, data provision, web tools, marketing instruments, digital networks and collaboration, planning and accounting, resource management systems, and transaction related applications.

There are two perspectives to this part of the report. On one hand, it can be read in a rather academic manner, against the backdrop of the comprehensive literature analysis of the preceding part on smart tourism and data-drive service designs (see part I of this report). On the other hand, the compact theoretical foundations and the empirical collection of this report function as self-standing, inspirational fundus and starting point for further work on practical implementation projects in future work packages. It supports ideation regarding conceptualizations on the business process, business model, and business ecosystem level. This practice review shows that there is considerable room for innovation, especially regarding business model configurations within and across firms, but also regarding business process optimizations in various areas of the tourism and hospitality domain.

10 Synthesis and outlook

After a brief introduction (chapter 1) of the scope of the second subproject within the Innosuisse flagship on resilient tourism, the **first part** of this report (chapters 2 to 5) is based on a literature review of data-driven smart tourism and provides key insights from *work-package 1*. This is followed by the **second part** of this report (chapters 6 to 9), which contains an empirical review of digitally enabled processes and business models in the tourism and hospitality ecosystem from *work-package 2*. These two parts (and work-packages) provide the basis for subsequent, conceptual work of the final phase of this flagship project (2024 onwards).

This **third part** of the report gathers the conceptual output that emerged from the combination of insights from theory (part I) and practice (part II). Both *work-packages 3 and 4* aim at developing novel concepts together with industry partners of this flagship project. As these ideas – ideally – create impact in the real world, they go beyond the scope of this (rather academic) report at hand. Therefore, this last section (chapter 10) provides both synthesis and outlook. It presents brief summaries of the conceived implementations and directs the reader to further outputs and possible follow-up projects of this flagship. For a detailed understanding of the different ideas, a look at the relevant materials is recommended (see also *Repository* in the Appendix).

Table 36: Structure of this report and relation to subproject packages (flagship resilient tourism, second subproject with four work packages)

Part	Chapters	Type	Content	Description	Work-Package	Time Frame
I	2–5	Theoretical	Literature review	Review of 2000+ sources on the topics	WP1 (and WP2)	2022–2023
II	6–9	Empirical	Practice review	Review of 400+ solutions in the field	WP2 (and WP1)	2023–2024
III	10	Conceptual	Project review	Overview of the 5+ novel ideas	WP3 and WP4	2024–2026

As the first and second parts of this report have shown, theory is lagging practice regarding the consideration and understanding of digitization in tourism and hospitality. While literature remains largely high-level and conceptual (with buzzwords such as smart tourism and tourism 4.0), practice shows that digitization is actively transforming the industry by optimizing the use of resources in processes and business models. However, not all enterprises in the heterogeneous sector of tourism and hospitality are equally advanced and integrated. Furthermore, it is apparent that the current wave of digitization is most heavily affecting areas that are information-based and thus (relatively) easy to digitize. It will be interesting to observe the future advent of more physical automation in the form of robotics and fully autonomous tools.

After this brief synopsis of the main parts of the report at hand and the state of digitization in tourism and hospitality, this chapter presents a collection of novel ideas for practice (10.1), which have been developed during this project. As most of these concepts have evolved into rather extensive projects of their own, they are just briefly summarized and attached with links to further materials, which appear in various formats (reports, presentations, databases, pilots, etc.). The chapter is then closed by a short outlook (10.2) regarding follow-up projects with implementations and a brief conclusion (10.3) with some final remarks on the project.

10.1 Novel ideas for practice

The following sections contain a range of ideas for generic as well as specific business systems and ways for their virtual digital integration in (Swiss) travel and hospitality. Possible configurations and governance models for digital collaboration within the tourism ecosystem have been explored (cf. *work-package 4*). These conceptualizations are conceived based on existing visitor patterns of behavior and consumption of tourists (cf. *work-package 3*). All this is developed with the backdrop of recent theoretical (cf. *work-package 1*) and practical (cf. *work-package 2*) developments. Furthermore, relevant partners from academia (HSLU, FHGR, HES-SO, EHL) and practice have been involved in ideation, both from within and outside the consortium of this Innosuisse flagship.

- (1) Tracking visitor flows
- (2) Finding tools for digitization in tourism
- (3) Benchmarking productivity in hospitality
- (4) Systematizing business models of hotel companies
- (5) Bundling accommodation and public transport
- (6) Evolving energy business models for cable car companies

The first idea proposes a **Swiss tourist app** as a national visitor-flow tracking instrument. Given the absence of granular, real-time data on travel patterns in Switzerland, a multi-stakeholder app is suggested, that simultaneously delivers utility to tourists and generates behavioral data for service providers. Suggestions for a future rollout are supported by an international market study.

The second contribution introduces a **digital tool-finder** for tourism businesses, built upon a database of approximately 400 applications and 60 functionalities mapped across the Swiss hospitality landscape. The prototype enables operators to identify relevant digitization solutions by functional category, which could facilitate collective procurement and shared support services.

The third proposition includes a **productivity benchmarking framework** grounded in real-time KPI monitoring via existing platforms and API integration. The framework positions productivity improvement as a systemic response to labor scarcity and margin pressure, linking operational optimization to strategic business model innovation in hospitality and gastronomy.

Fourth, a **hotel business model morphology** is introduced, structuring innovation potential along various dimensions and enabling systematic ideation for technology, capital, real estate, and labor configurations. The morphology serves as an ideation tool that is based on the business model framework, providing roughly 100 dimensions (domains) with up to 30 conditions each.

The fifth concept investigates the **bundling of accommodation with public transport**, informed by a trilingual market study conducted with relevant industry partners. Results indicate cautious interest, favoring a voluntary, customizable implementation model. This study complements an (updated) foundations report on the bundling of accommodation with baggage transport.

Finally, the section examines **energy business models for alpine cable car companies**, exploring renewable energy generation potential as a strategic response to climate change, rising operating costs, and energy market volatility – situated within the context of the Swiss federal *Solarexpress* initiative and the overarching theme of this subproject (resilient tourism).

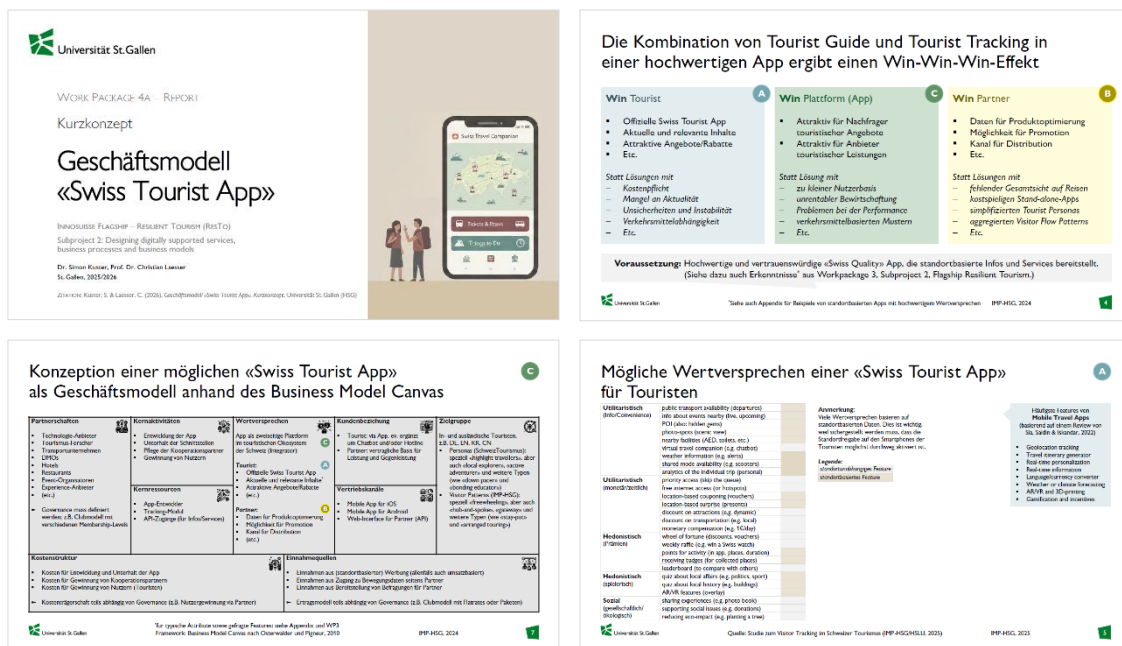
The subsequent sections present each of the six packages in the form of a brief fact sheet. For further information, several resources and outputs from the relevant package are referred to.

10.1.1 Tracking visitor flows

To be able to tailor products and services in tourism to visitor flows and touchpoints, actors need to better understand tourist behavior. In Switzerland, there is no granular data on national visitor flows available. We therefore suggest the release of a Swiss tourist app, a digital guide for tourists and a source of behavioural pattern data for tourist service providers. The proposed business model incorporates partnerships with various tourism stakeholders, a provision of monetized incentives, and access to movement data.

The concept outlines potential benefits and concerns from a theoretical perspective and indicates practical measures to improve the user experience. It concludes with suggestions for multi-phase development, club model governance, and alliance-building for app management. The granular data from the app could serve as real-time tourism monitor for Switzerland and make existing, non-digital approaches obsolete. However, such an app should provide considerable use value (utility, hedonic, social) to tourists as it can be assumed that they want to be compensated for the provision of data (privacy calculus or cost-benefit as well as technology acceptance and adoption issues). To investigate tourist preferences including cultural and personality differences regarding app features, an international market study has been conducted. Based on the results, a functional mobile app can be specified and developed (cf. 10.1.2 on digital tools in tourism).

Figure 92: Extract from business model concept on a Swiss travel app (platform configuration of Swiss Tourist App; IMP-HSG, 2025/2026)



Published sources and further resources derived from this module:

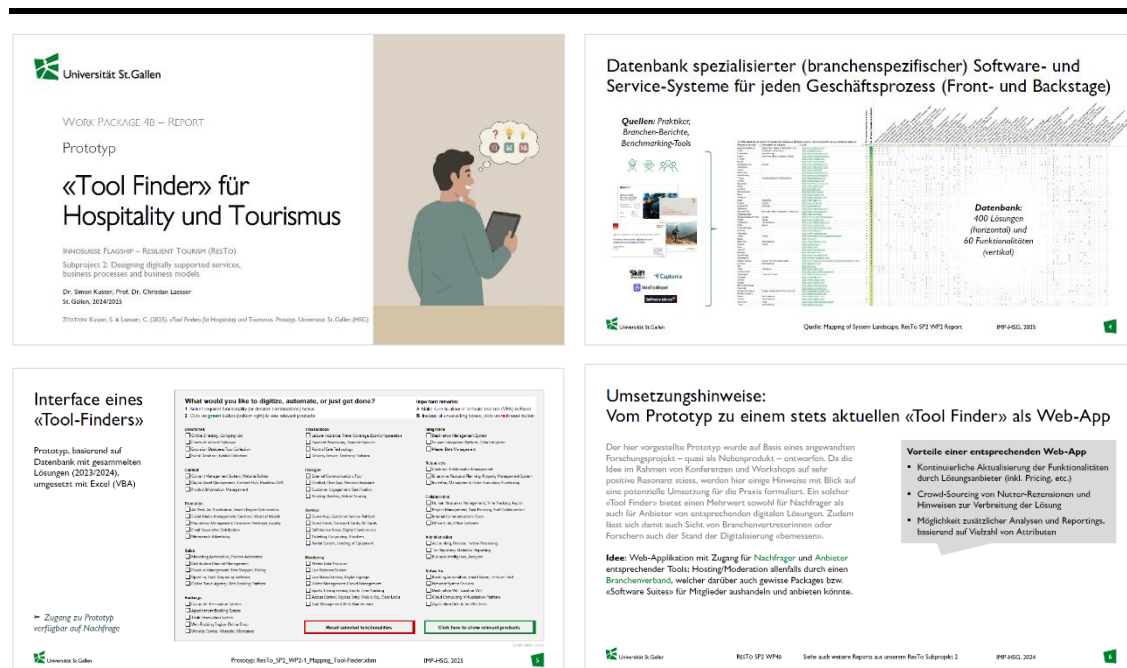
- ▶ ResTo_SP2_WP4-A_Tourist_Tracking_App (16 slides; related to WP3; in German)
- ▶ Report on Visitor Tracking in Swiss Tourism (64 pages, IMP-HSG with HSLU, 2025; in German)
- ▶ Conference paper on Kano-analysis of Swiss and German study (Enter, Wrocław, 19.2.2025)
- ▶ Market study: insights presentations for internal discussions with industry partners (2025/2026)
- ▶ Market study: insights workshop for 3rd resilient tourism conference (25 slides, Chur, 6.3.2025)
- ▶ Market study: survey with HSLU and Intervista in Switzerland, Germany, USA (2024/2025)
- ▶ Research deck on visitor flows and touchpoints (26 slides; IMP-HSG, 5.4.2024)
- ▶ Research report for tracking acceptance study (35 pages; IMP-HSG, 12.9.2023)
- ▶ Research deck for visitor tracking workshop with HSLU (66 slides; Lucerne, 7.8.2023)

10.1.2 Finding tools for digitization in tourism

Our mapping of digital processes on tourism and hospitality in Switzerland (cf. 7.1.1) has brought forward 400 frequently used digital applications with 60 functionalities, organised into various thematic clusters. Based on this database, a prototype of a tool-finder for companies (restaurants, hotels, destination managers, activity providers, etc.) has been developed and implemented as an Excel-based application (VBA). Users can select specific topics or functionalities, which they would like to digitize or automate. The recommender tool then generates a list of solutions, including descriptions and links to the specific product websites.

Preliminary validation through conferences and workshops elicited strongly positive industry resonance, confirming both practical relevance and market demand. To remain up-to-date and accessible, the mock-up should be rebuilt as a web application, accessible to both demand-side users and solution providers, with the underlying database subject to continuous maintenance – including crowd-sourced user reviews and vendor-side updates on features and pricing. Furthermore, it would make sense to procure certain products collectively and negotiate special rates. This might be done by industry associations who could then offer specific bundles (software suites) for their members. This could even be combined with certain shared implementation and support services across companies. The platform would additionally serve as an observatory for tracking the state of digitalization across the tourism sector. Furthermore, as soon as more data is available regarding the impact of specific products on business process efficiency, tool recommendations could be combined with productivity metrics (cf. benchmarking in 10.1.3).

Figure 93: Excerpts from concept for the prototype of a tool-finder for T&H (based on mock-up in Excel with VBA; IMP-HSG, 2024/2025)



Published sources and further resources derived from this module:

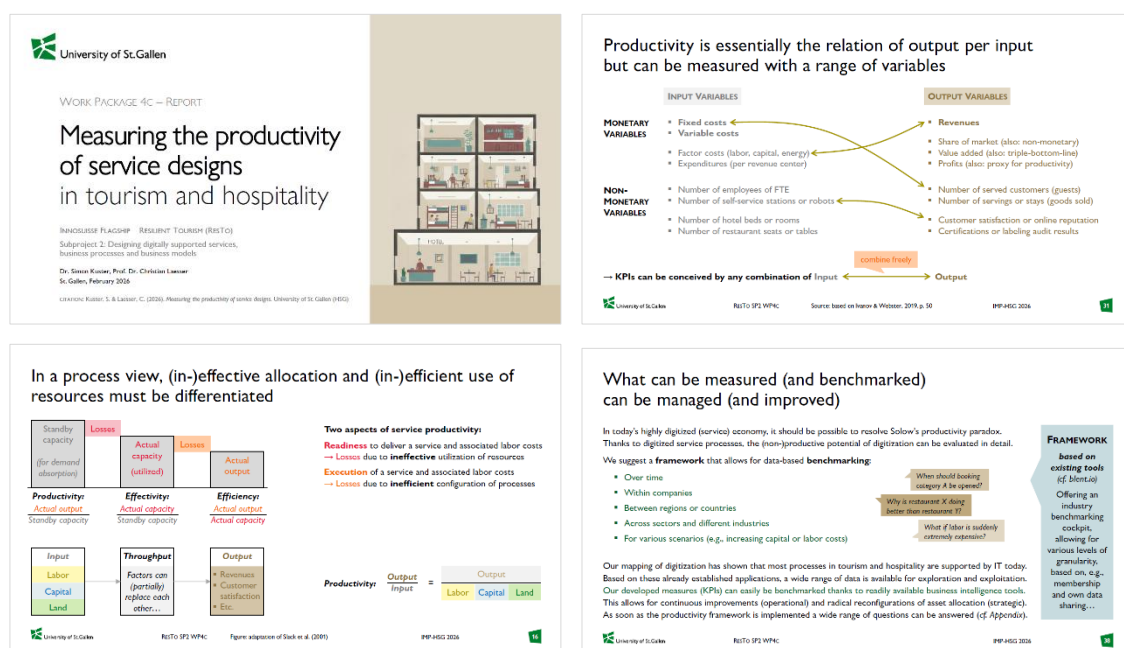
- ResTo_SP2_WP4-B_Tool_Finder_Prototyp (8 slides; related to WP2, in German)
- Experimental online tool, provided to selected DMOs (via HSG Sharepoint, 21.8.2024)
- Slide deck of IT landscape/map for 2nd resilient tourism conference (Lucerne, 4.4.2024)
- Internal database on 400 frequently used digital tools in Swiss T&H (artifact of WP2)

10.1.3 Benchmarking productivity in hospitality

Productivity is still a problematic and often misunderstood term in tourism and hospitality. In the sector's context, the concept carries negative connotations – evoking factory-like efficiency thinking that appears incompatible with the principles of outstanding personal service – and its measurement remains conceptually underdeveloped, according to literature. Swiss Federal Statistical Office data further illustrate a structural challenge: labor productivity in accommodation and food services has persistently lagged the total business sector since 1995, while median gross wages remain nearly 40% below the services sector average, a gap that cannot be explained by demand alone. The report argues that the aftermath of the Covid-19 pandemic and demographic shifts have fundamentally eliminated access to the cheap production factors (capital, labor, land) that historically masked this underperformance.

Going forward, service processes must be actively designed around scarce and costly resources. Productivity improvements provide answers to many problems: Addressing scarce labor while at the same time increasing margins and thus salaries for skilled staff. Through the implementation of digital benchmarking tools, hospitality companies should optimize business processes on an operational level by using process-level KPIs such as labor per check-in or covers per service hour and innovating their business models on a strategic level (cf. 10.1.4 on hotel business models), guided by metrics such as gross operating income per square meters across revenue centers. Thanks to existing platforms (Hospitality Cockpit based on Blent.io) and increasingly digitized hotels, a wide range of KPIs could be conceived, monitored, and improved in real-time.

Figure 94: Conceptual workshop slides on service productivity in tourism (in collaboration with Thomann Hospitality; IMP-HSG, 2024/2025)



Published sources and further resources derived from this module:

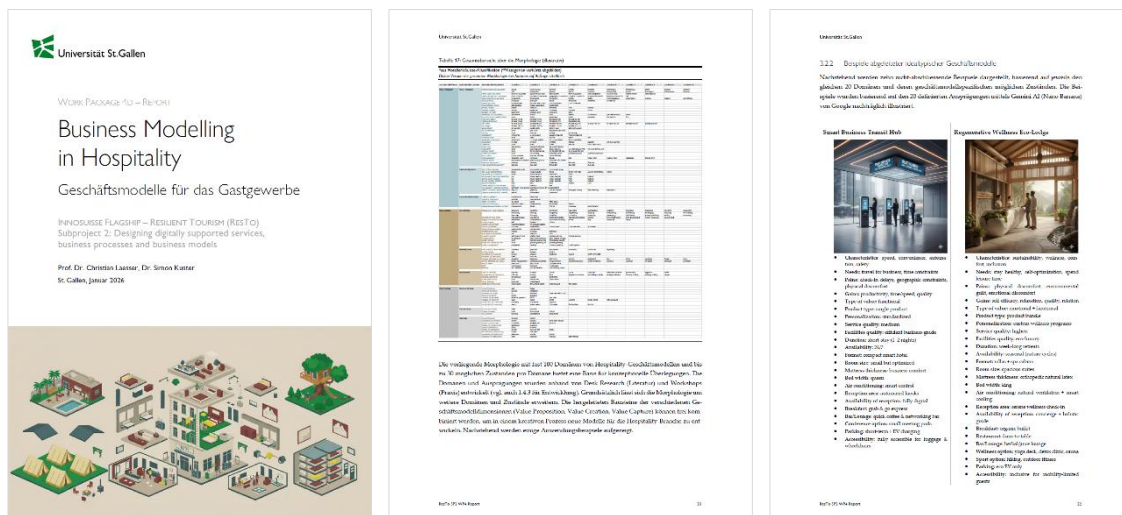
- ResTo_SP2_WP4-C_Measuring_Productivity_Hospitality_Report (48 slides; related to WP1)
- Conference presentation on productivity measurement (ResTo Conference II, Luzern, 4.6.2024)
- Conference presentation on service productivity (ResTo Conference I, Lausanne, 24.2.2023)
- Internal specification of a potential productivity benchmark tool (with Thomann Hospitality, 2024/2025)
- Internal workshop notes on productivity benchmark based on Blent (Thomann Hospitality, Steinhausen, 24.4.2024)

10.1.4 Systematizing business models of hotel companies

Hotels are challenged to systematically review their business models against a backdrop of mounting structural pressures: changing guest expectations around individualization, sustainability and experience; scarce and expensive labor in high-cost environments such as Switzerland; intensifying platform-driven competition and value capture by intermediaries; and the growing imperative of digitalization across all business processes. Based on data from digital benchmarking and other sources, they should ensure their most efficient and effective use of resources. The starting point for any such review is a fundamental clarification across four strategic domains: the operator's self-understanding beyond the narrow category of *hotel*; the breadth of the service chain along the customer journey; the design of room and service configurations relative to guest typology and location; and the processes required to execute the chosen model.

To facilitate a structured approach to business model innovation, we developed a morphology which builds on three key dimensions: infrastructure, service, and ownership. It serves as a starting point for systematic reviews and ideation surrounding the configuration of capital (including technology), land (real estate or rooms), and labor (or knowledge). The morphology is structured across four hierarchical levels, encompassing three business model dimensions (value proposition, value creation, value capture), nine business model canvas elements, approximately 100 hospitality-specific domains, and up to 30 possible configurations per domain. It was developed through desk research and validated in workshops with over 30 industry practitioners, resulting in ten illustrative ideal-type business models – ranging from ideas like *Smart Business Transit Hubs* to *Regenerative Wellness Eco-Lodges* – that demonstrate the potential of the instrument. Together with existing business model frameworks (cf. 6.3), it provides a valuable tool for fundamental business model innovation in hospitality (cf., e.g., 10.1.5 on bundling of services).

Figure 95: Excerpts from accompanying report on business modelling in hospitality (morphology and examples; IMP-HSG, 2024/2025)



Published sources and further resources derived from this module:

- ▶ [ResTo_SP2_WP4-D_Hospitality_Business_Modelling_Report](#) (32 pages; in German)
- ▶ [Ideation tool for crowd-sourced input on the morphology: \[bit.ly/hospitality-morphology\]\(https://bit.ly/hospitality-morphology\)](#)
- ▶ Slide deck for conference presentation and ideation (Hotelinside Meeting, Zug, 26.3.2026)
- ▶ Slide deck for conference presentation and ideation (Hotelinside Meeting, Luzern, 3.4.2025)
- ▶ Slide deck for conference presentation and ideation (Hotelinside Meeting, Zürich, 24.10.2024)

10.1.5 Bundling accommodation and public transport

Traveling to and from destinations is a major factor in the carbon footprint of tourism. Together with AllianceSwisspass, HotellerieSuisse, Switzerland Tourism and the Conference of Regional Tourism Directors of Switzerland (RDK), we conducted a market study to investigate the feasibility of a “public transport inclusive” concept to increase the share of public transport among travelers. The study is situated within the broader sustainability agenda of Swiss tourism policy and draws on comparable existing models, such as destination cards or regional guest cards, as precedents for bundling mobility with accommodation. The study can be seen as a specification of an earlier concept on the inclusion of public transport and baggage transport with overnight stays, which has been updated as well (updated foundations report).

The concept includes the integration of public transport into hotel offers, positioning it as an added-value service element rather than a mandatory surcharge. The study was targeted at hoteliers in Switzerland and therefore conducted in three languages. Survey findings reveal that while a majority of respondents recognize the ecological and reputational benefits of the concept, key concerns center on the uncertainty of cost absorption, the heterogeneity of guest profiles across hotel categories and regions, and the operational complexity of ticket administration. Especially smaller, independent properties express reservations regarding implementation effort relative to expected uptake. The report therefore suggests that a more customized, voluntary implementation could be useful, where hotel businesses have the option to purchase packages or volumes of public transport tickets based on individual characteristics – including property size, location, and target segment – allowing for a graduated, low-threshold entry into the concept without requiring sector-wide standardization. Future piloting in selected regions is recommended to gather empirical data on guest acceptance and assess the financial viability of a broader rollout.

Figure 96: Excerpt from market study on bundling of public transport and overnight stays (report «Hotel-ÖV inklusive»; IMP-HSG, 2024)



Published sources and further resources derived from this module:

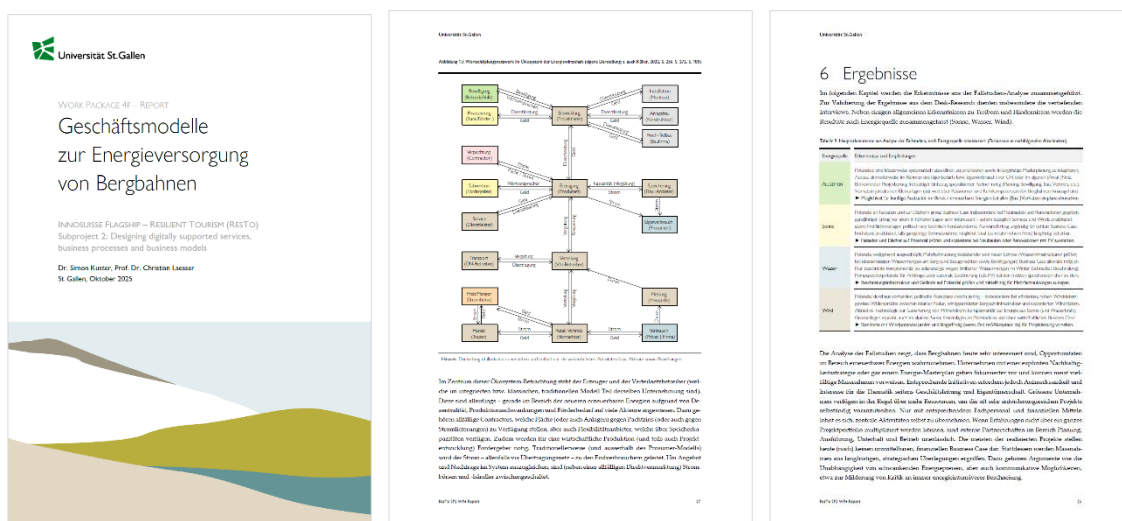
- ResTo_SP2_WP4-E_Report_Hotel-ÖV-inklusive (24 pages; in German)
- ResTo_SP2_WP4-Eplus_Report_ÖV-und-Gepäck-inklusive (26 pages; updated foundations report; in German)
- Special analysis for Grisons (Report on subset of Hotel-ÖV-inklusive; SPSS-Export, 25.6.2024)
- Slide deck for meeting with RDK and SBB (online, 27.7.2023)
- Slide deck for conference (Forum SVWG Bern, 9.5.2023)

10.1.6 Evolving energy business models for cable car companies

In the aftermath of the pandemic of 2020/2021 and the energy crisis of 2022/2023, the resilience of touristic enterprises was tested heavily. Due to climate change, cable car companies with reliance on winter operations are especially exposed due to rising costs for snow making and grooming. At the same time, mountain destinations are uniquely positioned to generate renewable power based on (partially already existing) infrastructure for power generation from water, sun, or wind. In 2022, the Swiss national parliament initiated the so-called *Solarexpress* to accelerate and subsidize installations of photovoltaics in alpine regions to produce electricity in winter – above the typical winter fog. Therefore, we investigated possible business models for energy generation by Swiss alpine cable car companies. The intent was to collect information from different case studies to understand the status quo, identify drivers and obstacles, and outline possible future scenarios, with the aim to provide an overview and derive actionable insights for the industry. The report provides relevant information for mountain cable car operations and sheds light on how these businesses can continue to thrive despite challenges of energy security and climate change.

Drawing on a structured analysis of ten Swiss cable car companies – spanning solar, hydro, and wind energy – the study finds that rooftop and facade photovoltaic installations offer the most viable business case, particularly for new construction and renovation projects, where self-consumption eliminates significant grid fees and levies. Hydropower potential is largely tapped, though multi-use of existing snowmaking infrastructure presents a promising avenue, as demonstrated by Davos Klosters Bergbahnen. Wind energy, while technically complementary to solar in winter months, faces substantial political resistance. Across all energy types, the report recommends a partnership-based approach focused on self-supply, and emphasizes that cable car operators should keep renewable energy firmly on their strategic agenda – ensuring future project opportunities are preserved even when immediate implementation is not yet feasible.

Figure 97: Excerpt from case-based study on business models for cable car companies (report for Seilbahnen Schweiz; IMP-HSG, 2025)



Published sources and further resources derived from this module:

- ▶ ResTo_SP2_WP4-F_Bergbahnen_Geschäftsmodelle_Energie (52 pages; available in German and French)
- ▶ Case studies based on interviews and desk research (10 cable car companies; IMP-HSG, 2024/2025)
- ▶ Research deck on energy business models and solar express (IMP-HSG, 2023/2024)

10.2 Steps toward implementation

As stated in the proposal from 2021, the output of this (sub-)project remains primarily conceptual. However, all the four work packages provide grounds for subsequent implementation projects. These require leadership from industry partners, many of which have been part of the consortium of this Innosuisse flagship project. Based on our empirical analyses and conceptual models, a range of practical tools can be conceived. While some of our deliverables are waiting for implementation or adoption, others have already been developed further.

10.2.1 Swiss guest pass

Based on our preceding work with HSLU (*cf. 10.1.1, Tracking visitor flows*), a Swiss guest pass is currently created. The vision outlines an intelligent visitor management platform designed to dynamically steer tourism demand using real-time contextual data. By analysing live factors such as location, weather, current capacity, and personal preferences, the system delivers tailored recommendations that guide guests toward underutilized attractions, quiet periods, and lesser-known spots, effectively easing crowding while creating immediate value for travellers. By connecting existing demand with available capacity at the right moment, the platform unlocks untapped revenue potential and promotes balanced economic growth across the entire ecosystem.

At its core, the system acts as a central data orchestrator, integrating previously isolated live and master data (including location trends, booking records, and operator capacity) under clear governance. This aggregated intelligence offers insights that individual businesses could not generate alone. Beyond traditional overnight visitors, the guest pass targets previously unmonitored groups such as day-travellers and residents, establishing a comprehensive view of leisure activities. By expanding its scope to include related fields like public mobility, the platform fosters broader partnerships across local, cantonal, and federal levels, ultimately serving as a reliable live data foundation to inform public policy, spatial planning, and infrastructure decisions. The guest pass is being developed further under the leadership of HSLU and relevant industry partners.

10.2.2 Hospitality tech stack

Building on our mapping of digitization in tourism and our proposed tool finder (*cf. 10.1.2, Finding tools for digitization in tourism*), HES-SO Valais is working on a hotel tech stack navigator. This is to be part of an overarching digital navigator for hospitality, including self-assessments, tool finder, transformation co-pilot, and accompanying webinars. The hotel tech stack navigator is a web-based platform designed to help hoteliers map, evaluate, and optimize their digital infrastructure. Built on our comprehensive database of around 400 hospitality software systems, the tool aims at guiding hotels away from fragmented architectures toward seamless, best-of-breed software environments. By prioritizing an integration-first approach, users input their current tools to uncover fully compatible solutions, effectively avoiding costly interface issues.

The conceived platform will enable side-by-side comparisons of up to four products across features, integration capabilities, and pricing models. To ensure decision-making relies on trustworthy data, user feedback is strictly verified through professional channels. Furthermore, vendors maintain their own interface listings, while industry associations can provide tailored software suites and special conditions for their members. The tech stack is currently curated and further developed by HES-SO Valais.

10.2.3 Hotel live benchmark

Based on our work on productivity in tourism and our collaboration with Thomann Hospitality (cf. 10.1.3, *Benchmarking productivity in hospitality*), a next-generation hotel benchmark tool is being conceived. Together with various industry stakeholders (hotels, gastronomy, technology), a fully digital benchmarking system based on live data will be implemented. The benchmark builds on Hospitality Cockpit, a tool based on technology by Blent, a startup originating at EHL. Swiss hotels currently rely on performance benchmarking tools that are static and retrospective. However, to manage productivity effectively and efficiently across labour, capital, and technology, hotel managers require real-time visibility into how specific inputs and resource allocations generate outcomes.

To bridge this gap, the project aims to introduce an automated, daily benchmarking tool that acts as an early-warning system, enabling hoteliers to actively steer performance based on various indicators rather than merely react to past results. By maintaining strict data ownership with participating Swiss businesses, the system builds a secure data foundation for industry associations and researchers to generate broader sector insights. Ultimately, this initiative drives productivity through refined process-cost business models while contributing directly to Switzerland's federal digitalization strategy and the National Data Infrastructure in Tourism (NaDIT). NaDIT is curated by HSLU and FHGR (cf. tourismdata.ch).

10.2.4 Hotel business model configurator

Building on our morphology of hotel business models (cf. 10.1.4, *Systematizing business models of hotel companies*) a configurator has been developed together with HES-SO Valais and industry partners. The configurator is an interactive digital tool designed to help hoteliers, developers, and consultants to systematically design, evaluate, and reconfigure hospitality business models. Grounded in the business model canvas framework, the tool structures the complex hotel ecosystem across three core dimensions: value proposition, value creation, and value capture. Within these core dimensions, the configurator encompasses about 100 distinct design domains, such as target customer segments, operational structures, partner networks, and pricing strategies, with up to 30 configurable states per domain.

Rather than prescribing a single fixed strategy, it functions as a strategic thinking tool that allows users to map current operations or experiment with new concepts step by step. By illustrating interdependencies between service offerings, resources, and revenue models, it helps businesses break traditional paradigms to unlock new value and ensure economic viability. Integrated generative AI serves as a sparring partner, helping users develop coherent future scenarios (such as automated micro-hotels or regional hospitality ecosystems) and illustrating them visually, making it an ideal framework for strategic workshops and long-term planning. The configurator is already freely available online (cf. hotel-business-model-innovation.net) and maintained by HES-SO Valais. It should not be viewed as a static tool, but rather as something that allows for continuous refinement.

10.2.5 Hotel with public transport included

Based on our studies on the bundling of accommodation and public transport (and/or luggage transport), various implementation variants have been conceived (cf. 10.1.5, *Bundling accommodation and public transport*). In the summer season of 2026, Valais tourism has partnered with Alliance SwissPass and key regional tourism and transport organizations to launch a pilot mobility ticket aimed at domestic guests. Visitors booking directly with participating hotels in the canton of Valais for at least two nights receive a complimentary round-trip public transportation ticket.

Supported by the federal Innotour program, the initiative seeks to promote sustainable travel, elevate the overall guest experience, boost direct hotel bookings, and incentivize longer stays. Academic partners from HES-SO, HSLU and HSG are accompanying the pilot. The goal is to study guest travel behaviour to determine how public transit incentives influence regional tourism value and sustainability. While there are various regional initiatives that include public transport in overnight stays (e.g., Ticino Ticket, cf. ticino.ch/ticket), this pilot includes the full return trip from home (within Switzerland).

10.2.6 Energy business models for cable cars

Our study on energy business models for cable car companies provided a selection of case studies on renewable power sources (cf. 10.1.6, *Evolving energy business models for cable car companies*). The report serves as a collection of references for members of the Swiss Cablecar Association and beyond. In the current environment, larger endeavours regarding investments in sustainable energy creation do not seem feasible. Even alpine energy projects funded under the federal *Solarexpress* initiative with investment subsidies of more than 50% do not really take off. So far, only four of dozens of alpine solar projects are being realized, all four without relevant involvement of cable car companies. However, as geopolitical tensions increase, prices and volatility of energy might rise again. It is therefore very well possible that projects that were thought to be unprofitable suddenly become feasible again.

Apart from this study on energy business models with Swiss cable car companies (featured on seilbahnen.org), all of our work streams resulted in follow-up projects with tangible results. Some of these projects have been transferred to partners from academia (HES-SO, HSLU, FHGR, EHL), others must be handed over to practice partners. Thanks to the broad range of implementation partners of this flagship (sub-)project (Switzerland Tourism, Hotelleriesuisse, Gastrosuisse, Swiss Cablecar Association, Thomann Hospitality Management, DiscoverSwiss, Swiss Federal Railways, Intervista, and selected Destination Management Organizations across Switzerland), we ensured that a range of our newly generated insights and ideas (cf. 10.1) found – and still find – their way into the Swiss tourism and hospitality ecosystem.

10.3 Conclusion

Building on recent developments in theory and practice, the last part of this report provides a range of novel ideas for tourism and hospitality. While following visitor flows and touchpoints, these concepts relate to all areas of the industry, ranging from hotels and restaurants to destination and transportation organizations. They build on data-based business processes, digitally enabled business models, and industry-wide ecosystems.

However, to leave the conceptual phase and enter the real world, they need to be tested and implemented by practice. Thanks to its broad-based consortium, this flagship does not remain in the academic realm but creates impact across the industry. Due to close collaboration between academia and industry as well as stakeholders from different areas of tourism and hospitality, many of the concepts are already materializing in follow-up projects.

It will be interesting to see how the latest developments in AI will help making the industry more resilient. After a detailed analysis of the first wave(s) of digitization in tourism (cf. part I of this report) and its impact in practice (cf. part II), it seems wise to let pass the hype and buzz. Instead, we recommend starting with small and tangible initiatives (cf. part III), first on a process level, then on a business model level, and finally also on the ecosystem level.

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Repository

The following repository contains all published outputs produced by the University of St. Gallen (and others) for Subproject 2 of the Innosuisse Flagship “Resilient Tourism” (cf. section 10.1):

<https://alexandria.unisg.ch/entities/funding/cb55b11e-c4ab-42da-b52f-165848568ed0>

Year	WP	Type	Title	Abstract
2023	WP1	Conference contribution	One solution fitting many problems: Improving the productivity of service designs	Many travel and tourism enterprises are confronted with low margins and low profitability. Value is insufficiently ‘captured’ and often lost to intermediaries. In the recent past, many tourism and hospitality processes only could create value at all because they had access to favourable production factors. However, in the aftermath of the pandemic and due to demographic changes, key production factors (land, capital, labour) have become scarce and thus expensive. Processes must therefore be increasingly aligned with the available and often scarce human and financial resources: ‘design to resources’. Improving effectivity and efficiency of systems and processes is key to improving service (and customer) productivity in tourism and hospitality. Insights from literature and practice show, that digitization and technology are key drivers.
				
2024	WP2	Conference contribution	Measuring and managing productivity: Digitally supported service designs and business models	The tourism and hospitality sector faces challenges related to stagnant labour productivity and relatively low wages. A key issue lies in the lack of a clear understanding of productivity in services and in tourism specifically. However, the ongoing digitization is transforming the industry. On one hand, technology has the potential to enhance efficiency of processes and systems at an operational level. On the other hand, it provides essential data for systematic productivity measurement and management. This data-driven approach offers valuable insights into optimizing resource allocation (including land, capital, and labour) at a strategic level. Companies can refine process designs and business models by optimizing the deployment of skilled labour, technological tools, and self-service options. Looking ahead, tourism and hospitality enterprises should leverage real-time data to benchmark and enhance their productivity.
				
2025	WP3	Conference contribution	Incentives for Visitor Tracking: Is Gamification the Way to Go?	Data is essential to better understand tourists and visitor flows as well as to better inform and guide tourists and manage visitor flows. In the age of data protection and overtourism, destination management organizations and national tourism organizations are challenged to find ways for consensual visitor tracking via mobile apps. Based on social exchange theory, it can be assumed that people are willing to provide personal location data when being compensated fairly. In this study, we find and explore a selection of potential mobile app features, ranging from utilitarian (personalized content, higher value of services, monetary rewards) to hedonic (gamified features) and social benefits. Based on the Kano model and a representative sample of 2038 panellists, we classify app features according to their ability to make people use a mobile app and thus allow for location-based tracking. Results show that gamification seems appealing to a subset of younger generations, while utility features are more broadly accepted and wanted. Social elements of travel mobile apps seem less attractive and relevant to most people. To convince a representative group of tourists to use a mobile app with tracking capabilities, we conclude that the focus should primarily be on actual utility of the app while gamified features should be implemented with care.
				

Year	WP	Type	Title	Abstract
2026	WP3	Report (empirical)	Visitor Tracking im Schweizer Tourismus	This report establishes a framework for the conceptual design of scientific research and the practical implementation of visitor tracking in Swiss tourism. It is based on a comprehensive literature review, which forms the foundation for an empirical study on the acceptance of visitor tracking. The findings of the study provide the basis for implementing a deployable solution in collaboration with industry partners. Methodologically, the report combines a systematic literature analysis with a quantitative survey of tourists in order to identify acceptance factors as well as the opportunities and risks associated with visitor tracking. In addition, existing practical examples from Swiss destinations are analysed, and legal and ethical framework conditions are taken into account in order to derive practice-oriented recommendations for action.
				
2026	WP4-A	Report (conceptual)	Kurzkonzept zum Geschäfts- modell einer «Swiss Tourist App»	This concept report outlines the business model of a Swiss Tourist App functioning as a two-sided platform serving both tourists with a digital travel companion and tourism service providers with granular behavioural data. By combining tourist guiding and tourist tracking, the concept generates a win-win-win effect for users, partners, and the platform itself, with location-based features – ranging from real-time information and gamification to dynamic discounts – forming the core of the value proposition. Development is envisioned iteratively, building on existing solutions and progressively evolving into a tool for managing, activating, and retaining guests. The concept was developed as part of the Innosuisse flagship initiative “Resilient Tourism” and is based on findings from our study on “Visitor Tracking in Swiss Tourism” (HSG & HSLU, 2026).
				
2026	WP4-B	Report (conceptual)	Prototyp eines «Tool-Finders» für Hospitality und Tourismus	This report, developed within the Innosuisse Flagship project “Resilient Tourism”, presents a prototype of a “Tool Finder” for the hospitality and tourism sector. Given the vast and rapidly growing number of digital solutions – a systematic mapping identified approximately 400 tools covering up to 60 functional categories – a filter-based interface was developed to help industry actors efficiently identify software matching their specific business process needs. As a next step, the authors propose a collaborative web application that could be continuously updated by solution providers, users, and industry associations.
				
2026	WP4-C	Report (conceptual)	Measuring the productivity of service designs in tourism and hospitality	This report examines the productivity of service designs in tourism and hospitality, addressing the persistent challenge of measuring and improving productivity in a sector traditionally resistant to the concept. Drawing on conceptual frameworks, industry case studies, and a mapping of digital applications across business processes, it identifies key drivers of both operational efficiency and strategic resource effectiveness. A set of KPIs is developed that allows firms to benchmark productivity at the process level - from housekeeping and reception to food and beverage operations - leveraging already-available business intelligence tools. The proposed framework enables data-driven, continuous improvement as well as radical reconfiguration of asset allocation, with the aim of benefiting both service providers and their customers. This report compiles findings from the Innosuisse flagship project “Resilient Tourism” (ResTo).
				

Year	WP	Type	Title	Abstract
2026	WP4-D	Report (conceptual)	Business Modelling in Hospitality – Geschäftsmodelle für das Gastgewerbe	This report, part of the Innosuisse Flagship project “Resilient Tourism”, develops a structured decision-making tool for configuring business models in the commercial lodging sector. Building on established business model theory – in particular the Business Model Canvas with its dimensions of Value Proposition, Value Creation, and Value Capture – a morphology comprising approximately 100 hospitality-specific domains and up to 30 possible states per domain is developed. The resulting framework is illustrated using ten ideal-typical business model configurations and is available as a practice-oriented tool for the systematic further development of business models in the hospitality industry. <i>The report is complemented by an interactive web-tool.</i>
2026	WP4-E	Report (empirical)	Studie zum Konzept «Hotel mit ÖV inklusive»	A significant portion of tourism’s environmental impact stems from travel to and from vacation destinations. If travel is to become more sustainable, lower-carbon mobility is essential. Switzerland’s well-developed public transportation system holds untapped potential for tourism in this regard. To increase the share of public transportation in tourist travel to and from destinations, access should be as low-barrier as possible. At the initiative of the Conference of Regional Directors, this study, conducted in collaboration with Alliance Swiss-Pass, HotellerieSuisse, and Switzerland Tourism, explored possible alternatives for including interregional transportation services. The goal was to gauge interest among hotels in incorporating specific “inclusive options” into their accommodation offerings. To this end, three concrete offers were developed and evaluated. Various implementation recommendations were derived. <i>The report is complemented by an extended (earlier) foundations report.</i>
2026	WP4-F	Report (empirical)	Geschäftsmodelle zur Energieversorgung von Bergbahnen	For cable car companies, the question arises as to what role they could play in the context of expanding renewable energies. To this end, this report compiles relevant basic knowledge on the Swiss energy industry and various business model configurations. Against this backdrop, specific case studies of Swiss cable car companies with initiatives in the energy sector are presented. The aim is to identify the drivers and obstacles of such projects involving mountain railways and to derive insights for business models and governance. The focus here is on renewable sources of solar, wind, and hydroelectric power. <i>The report is available in German and French.</i>

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