

# Digital Government

## Strategy, Government Models and Technology

Lecture Material

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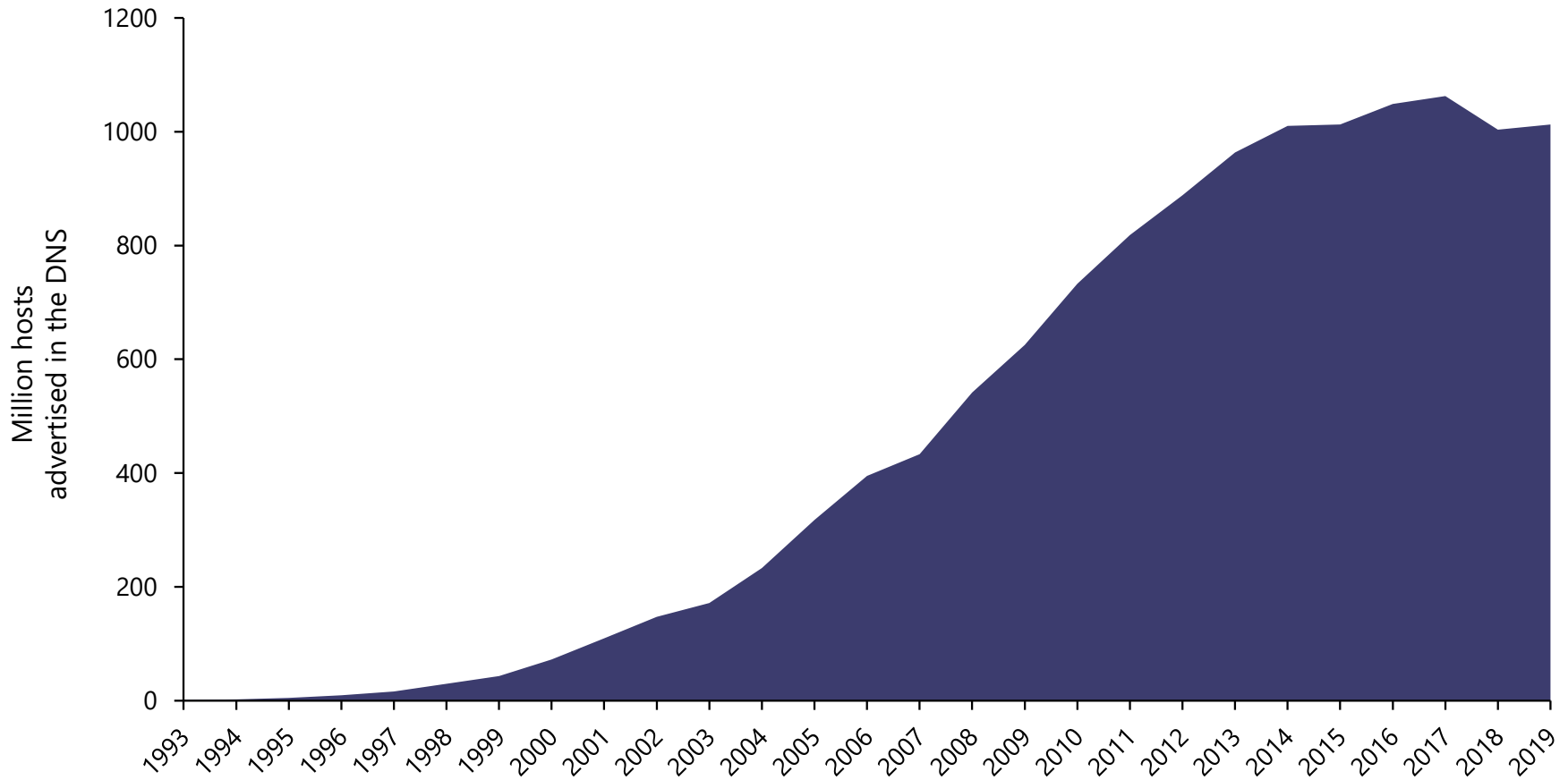
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# **Part I - Concept and Strategy of Digital Government**

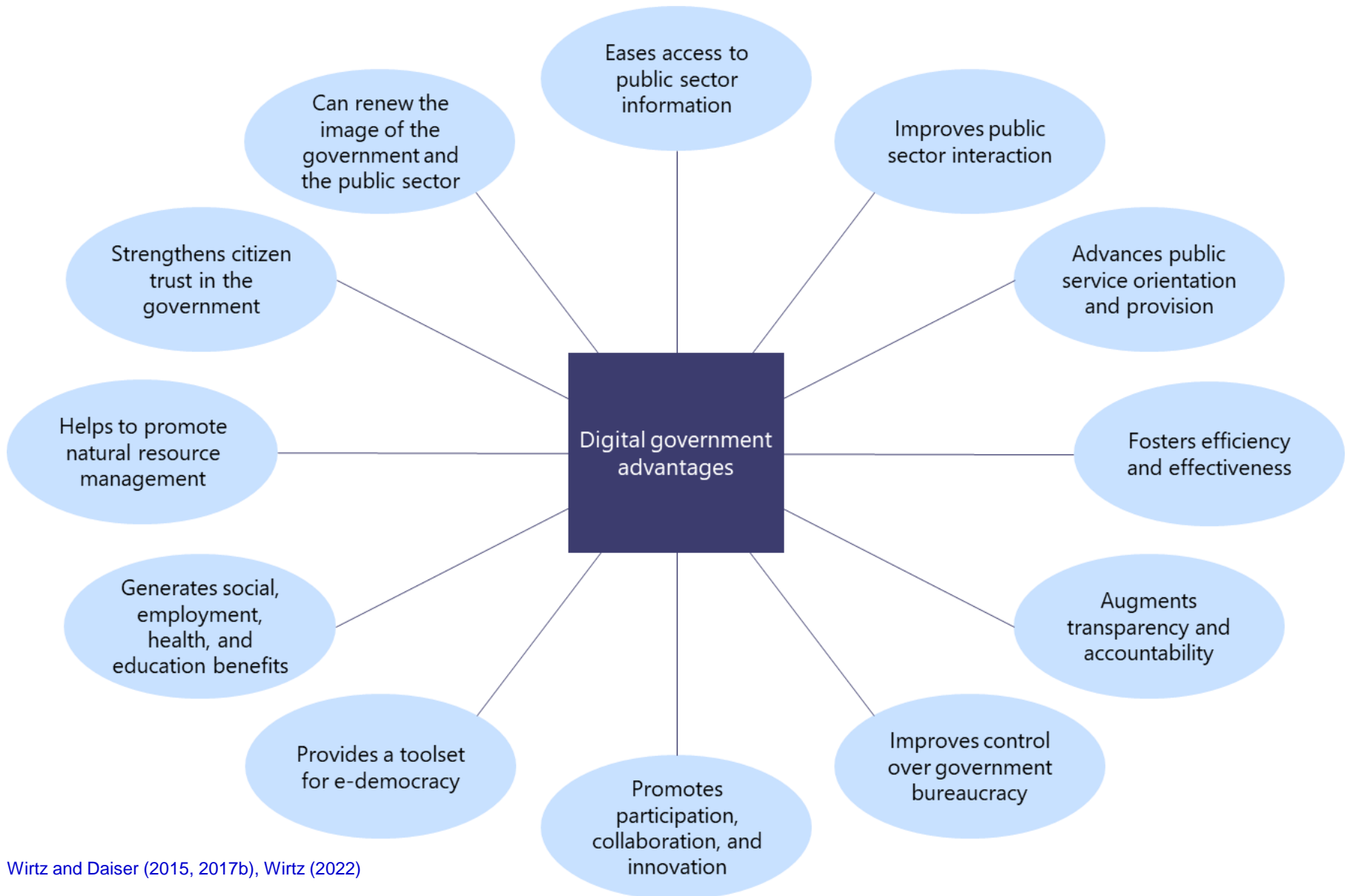
# Chapter 1: Introduction

## Fig. 1.1 Development of the number of Internet hosts since 1993



Data Source: ISC (2019), and Wirtz (2022)

## Fig. 1.2 Advantages of digital government



Wirtz and Daiser (2015, 2017b), Wirtz (2022)

## Table 1.1 Selected definitions of digital government/e-government

Author(s)	Definition
Silcock (2001)	Simply stated, e-Government is the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees.
UNDPEPA and ASPA (2002)	[...] E-government is defined as: utilizing the internet and the world-wide-web for delivering government information and services to citizens.
Carter and Bélanger (2005)	[...] the use of information technology to enable and improve the efficiency with which government services are provided to citizens, employees, business and agencies.
Heeks (2005)	[...] E-government in a broad sense: all use of information technology in the public sector. It covers a broad range of managerial issues: from high-level strategy to detailed tactics; from the technicalities of data flows and process mapping to the politics of e-government.
Evans and Yen (2006)	Simply speaking, E-Government means the communication between the government and its citizens via computers and a Web-enabled presence. The advantages in timeliness, responsiveness, and cost containment are outstanding.
Spirakis et al. (2010)	Electronic government is the use of Information and Communication Technology in the transformation of government; primarily aiming to the improvement of accessibility, effectiveness and responsibility. It is based on the diffusion of the information and the information policy development. Electronic government guides to increasing citizens' participation and active citizens' development affecting the mechanisms of democracy.
Veit and Huntgeburth (2014)	Digital government is defined as the use of Information and Communication Technologies (ICT), in particular the internet, to transform the relationship between government and society in a positive manner.
Yavwa and Twinomurinzi (2019)	Digital government is defined as a socio-technical phenomenon or mechanism by which governments provide efficient services using ICT in a seamless and interfaced manner.
Twizeyimana and Andersson (2019)	e-Government is commonly conceptualized as governments' use of Information and Communication Technologies (ICTs) combined with organizational change to improve the structures and operations of government.



## Table 1.2 Range differences of digital government definitions

	Minimum range	Maximum range
Scope	Information and service delivery	Enabler for e-democracy
Subject	Citizen	All public sector stakeholders
Technology	Computer and web presence	Internet

Wirtz and Daiser (2015, 2017b), Wirtz (2022)

# Definition of Digital Government

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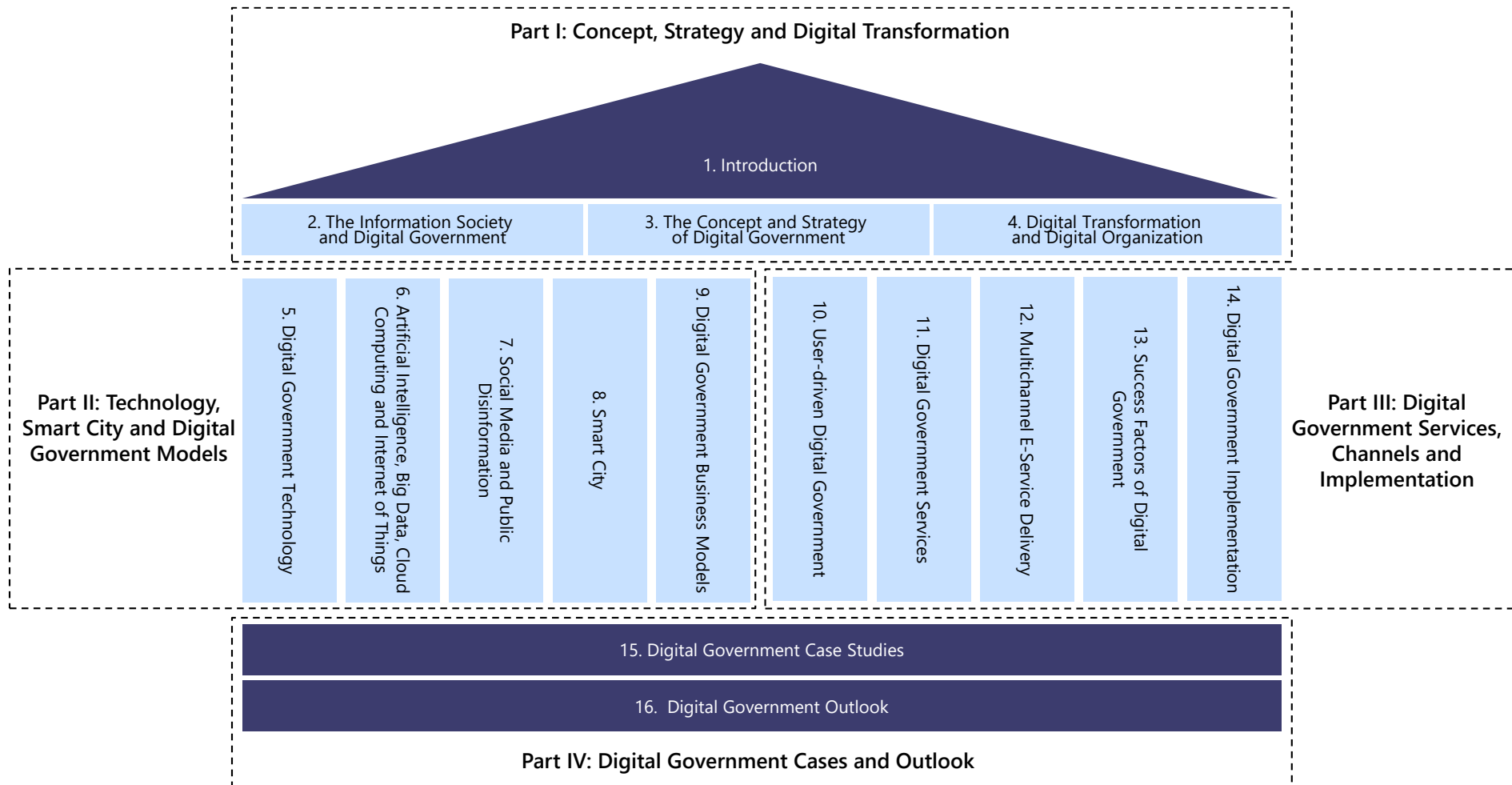
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The term digital government describes the electronic handling of administration and democracy processes in the context of governmental activities by means of information and communication technologies to support public duties efficiently and effectively.

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Source: [Wirtz and Piehler \(2010\)](#), [Wirtz and Daiser \(2015\)](#), [Wirtz \(2020b, 2022\)](#)

## Fig. 1.3 Structure of the textbook



Source: Wirtz (2022)

# Chapter 1

## Review questions, topics for discussion and online exercises

### Chapter 1

#### Review questions, topics for discussion and online exercises



#### Review questions

1. Describe the major changes that have been caused by the worldwide use of the Internet.
2. Explain the importance of modern information and communication technologies for governments and public administrations.
3. Describe the advantages of digital government.
4. Define digital government.
5. Describe the range differences of digital government definitions.



#### Topics for classroom discussion and team debates

1. Discuss the advantages and disadvantages of digital government for your city.
2. Discuss to what extent excellent digital government is important for the development of the information society.
3. Discuss the relevance of digital government for the international competitiveness of states in global competition.

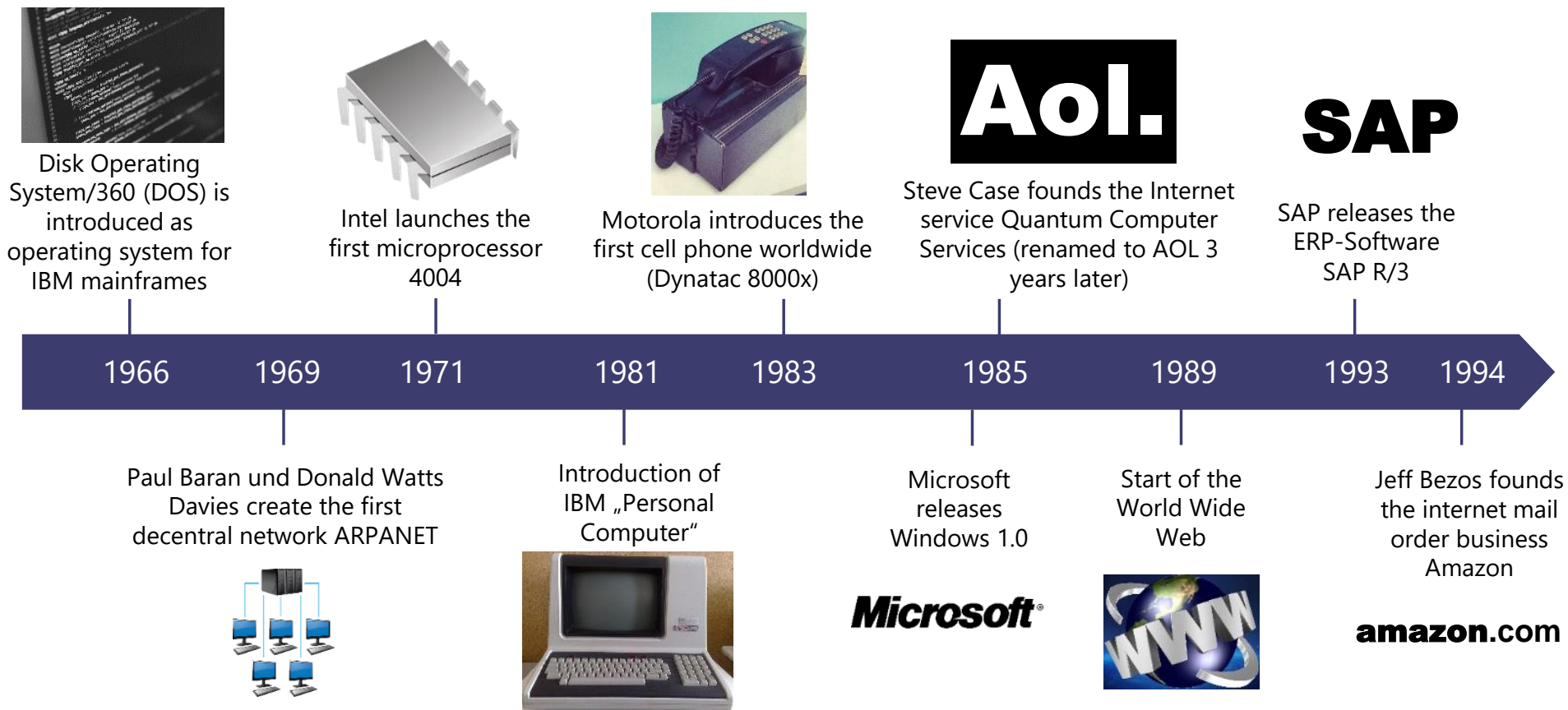


#### Online Exercises

1. Visit your local digital government website (city website) and explore the structure of the site.
2. Visit [www.un.org](http://www.un.org) and explore the different content and service offerings.
3. Compare the offerings of [www.un.org](http://www.un.org) and your city's website. What are the differences in content and services (goals, target groups)?

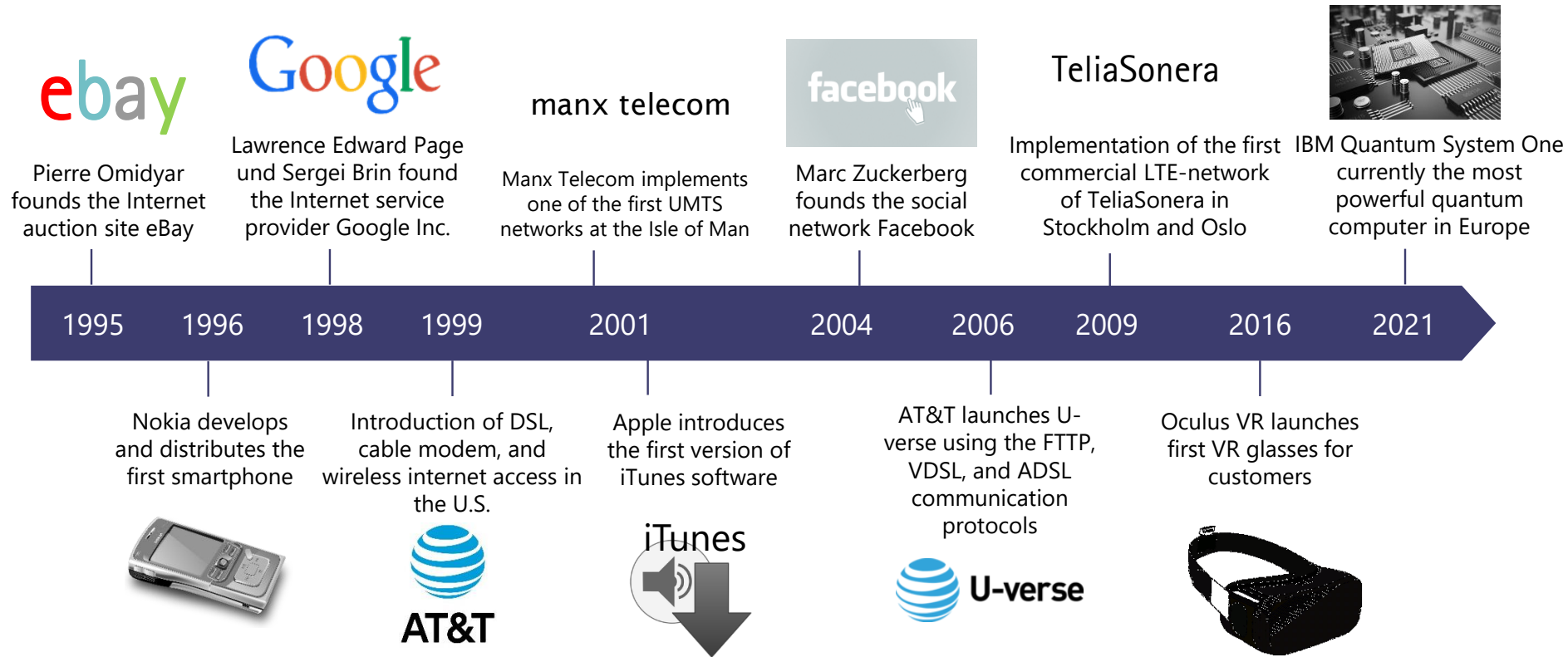
# **Chapter 2: The Information Society and Digital Government**

## Fig. 2.1 Development of information and communication applications (1966 until 1994)



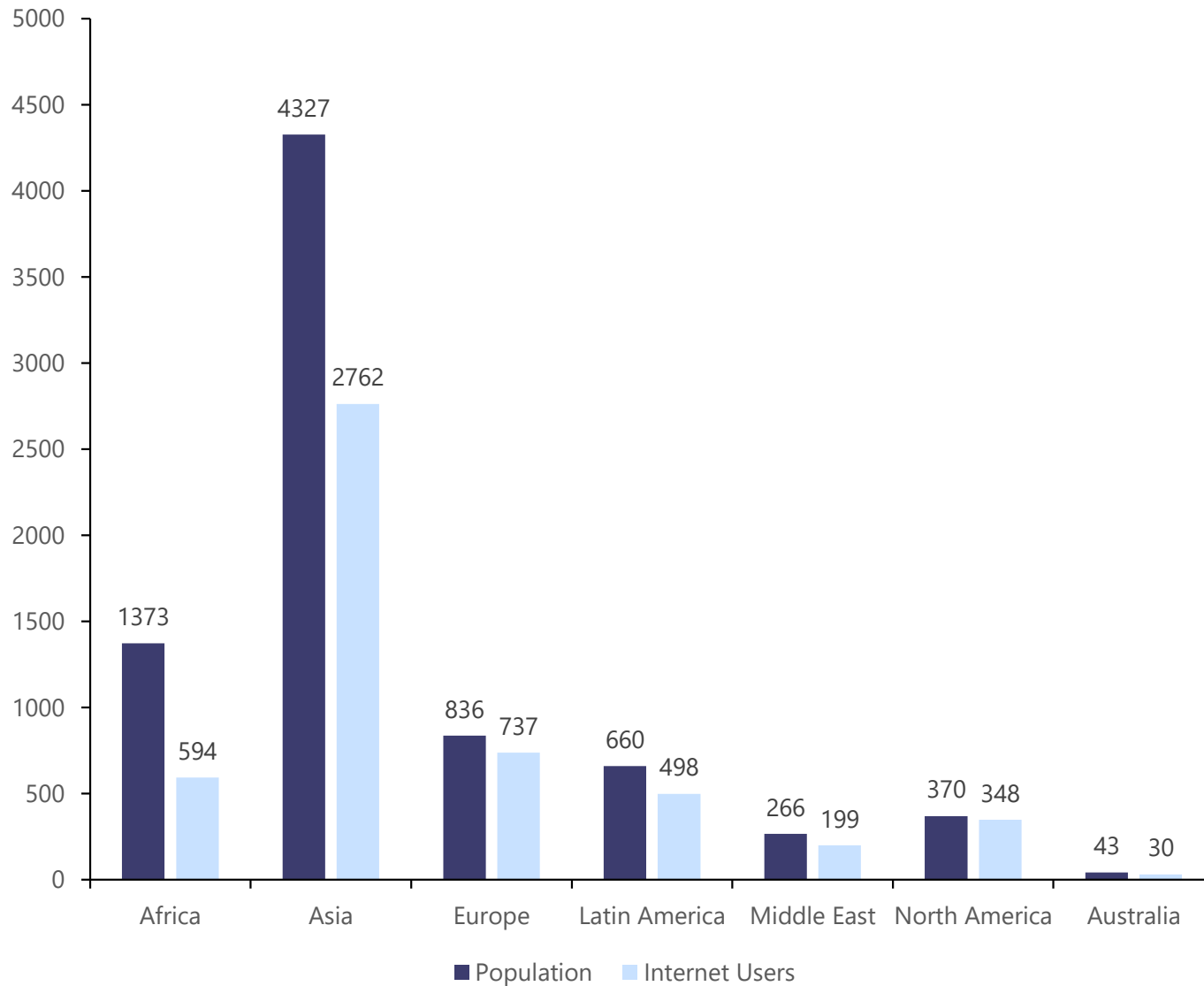
Source: Wirtz (2013b, 2021b, 2022)

## Fig. 2.2 Development of information and communication applications (1995 until 2019)



Source: Wirtz (2013b, 2021b, 2022)

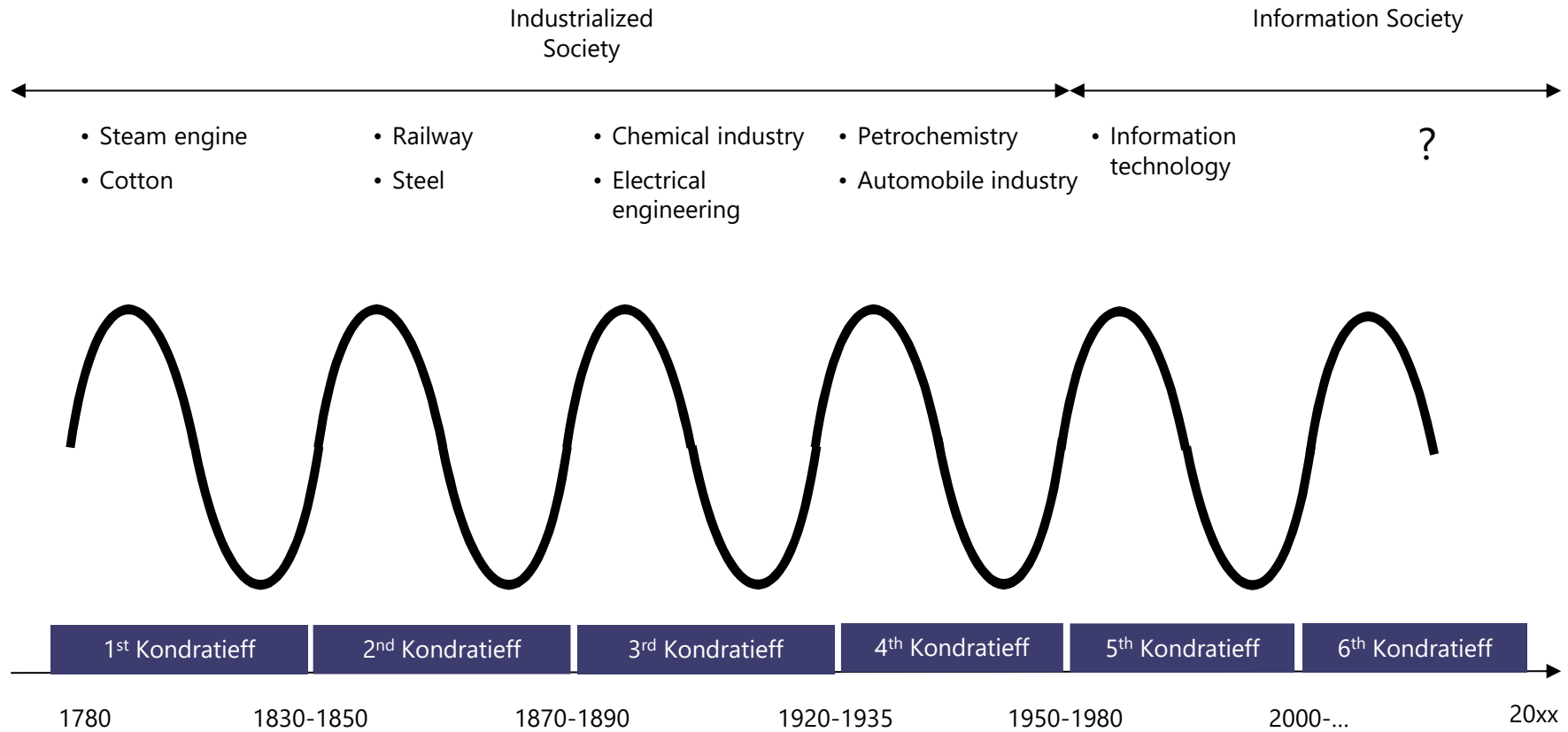
## Fig. 2.3 Worldwide Internet usage and population statistics



Data Source: Internet World Stats (2021), and Wirtz (2022)



## Fig. 2.4 The development of a technological revolution



Source: Wirtz (2019b, 2020b, 2021b, 2022)

## Table 2.1 ICT Development Index

No.	Countries	Rank 2017	IDI 2017	Rank 2016	IDI 2016	Rank 2015	I
1	Iceland	1	8.98	2	8.78	3	
2	Republic of Korea	2	8.85	1	8.8	1	
3	Switzerland	3	8.74	4	8.66	7	
4	Denmark	4	8.71	3	8.68	2	
5	United Kingdom	5	8.65	5	8.53	4	
6	Hong Kong, China	6	8.61	6	8.47	9	
7	Netherlands	7	8.49	10	8.4	8	
8	Norway	8	8.47	7	8.45	10	
9	Luxembourg	9	8.47	9	8.4	6	
10	Japan	10	8.43	11	8.32	11	
11	Sweden	11	8.41	8	8.42	5	
12	Germany	12	8.39	13	8.2	14	
13	New Zealand	13	8.33	12	8.23	16	
14	Australia	14	8.24	16	8.08	13	
15	France	15	8.24	17	8.05	17	
16	United States	16	8.18	15	8.13	15	
17	Estonia	17	8.14	14	8.16	20	
18	Singapore	18	8.05	20	7.85	19	
19	Monaco	19	8.05	18	8.03	18	
20	Ireland	20	8.02	19	7.9	22	

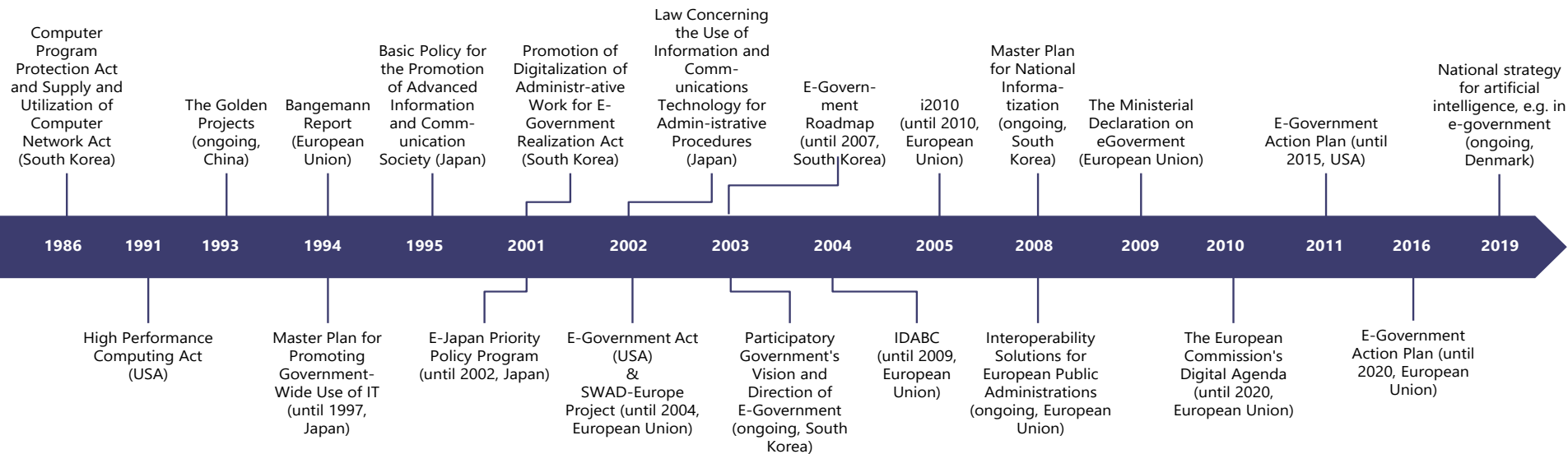
Data Source: ITU (2015, 2017), Wirtz (2022)

## Table 2.2 World E-Government Leaders in 2020

No.	Country	Region	EGDI 2020	Rank 2020	Rank 2018
1	Denmark	Europe	0.9758	1	
2	Republic of Korea	Asia	0.9560	2	
3	Estonia	Europe	0.9473	3	
4	Finland	Europe	0.9452	4	
5	Australia	Oceania	0.9432	5	
6	Sweden	Europe	0.9365	6	
7	United Kingdom	Europe	0.9358	7	
8	New Zealand	Oceania	0.9339	8	
9	United States	Americas	0.9297	9	
10	Netherlands	Europe	0.9228	10	
11	Singapore	Asia	0.9150	11	
12	Iceland	Europe	0.9101	12	
13	Norway	Europe	0.9064	13	
14	Japan	Asia	0.8989	14	

Data Source: United Nations Department of Economic and Social Affairs (2020), Wirtz (2022)

# Fig. 2.5 Overview of selected e-government/digital government acts and initiatives (1986-2019)



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2021b, 2022)

# Chapter 2

## Review questions, topics for discussion and online exercises

### Chapter 2

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Outline the development of information and communication technology.
2. Explain the principle of Kondratieff waves.
3. List the countries with the highest ICT Development Index.
4. Name five important e-government/digital government acts.
5. Which countries are the World E-Government Leaders in 2020 according to the UN?



##### Topics for classroom discussion and team debates

1. Discuss the changes that the Kondratieff-cycle of digitalization causes.
2. Discuss the perspectives of an information society against the background of data security as well as personal and privacy rights.
3. Why are there are such large differences between countries in the areas of information and communication technology and digital government and what might be the underlying causes? Discuss!

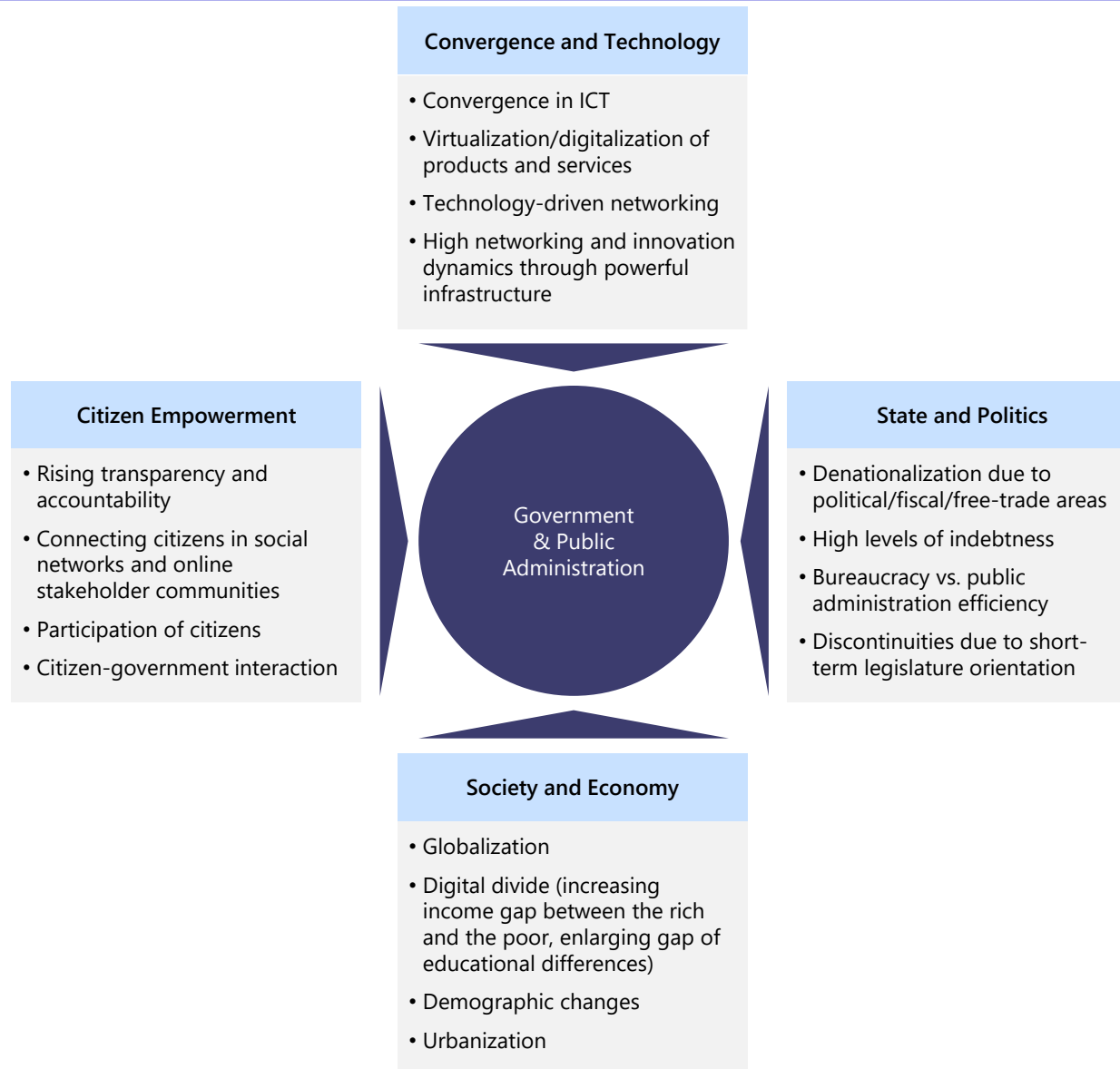


##### Online Exercises

1. Go to <https://publicadministration.un.org/en/Research/UN-e-Government-Surveys>. Examine how the UN's E-Government Ranking is arrived at. Discuss whether the criteria applied are useful.
2. Enter <https://www.ai.gov/>. Look at the contents of the initiative and identify its main issues and goals.
3. Visit <https://ec.europa.eu/jrc/en/science-area/information-society>. Explore what aspects make up the Information Society and what main topics are related to it.

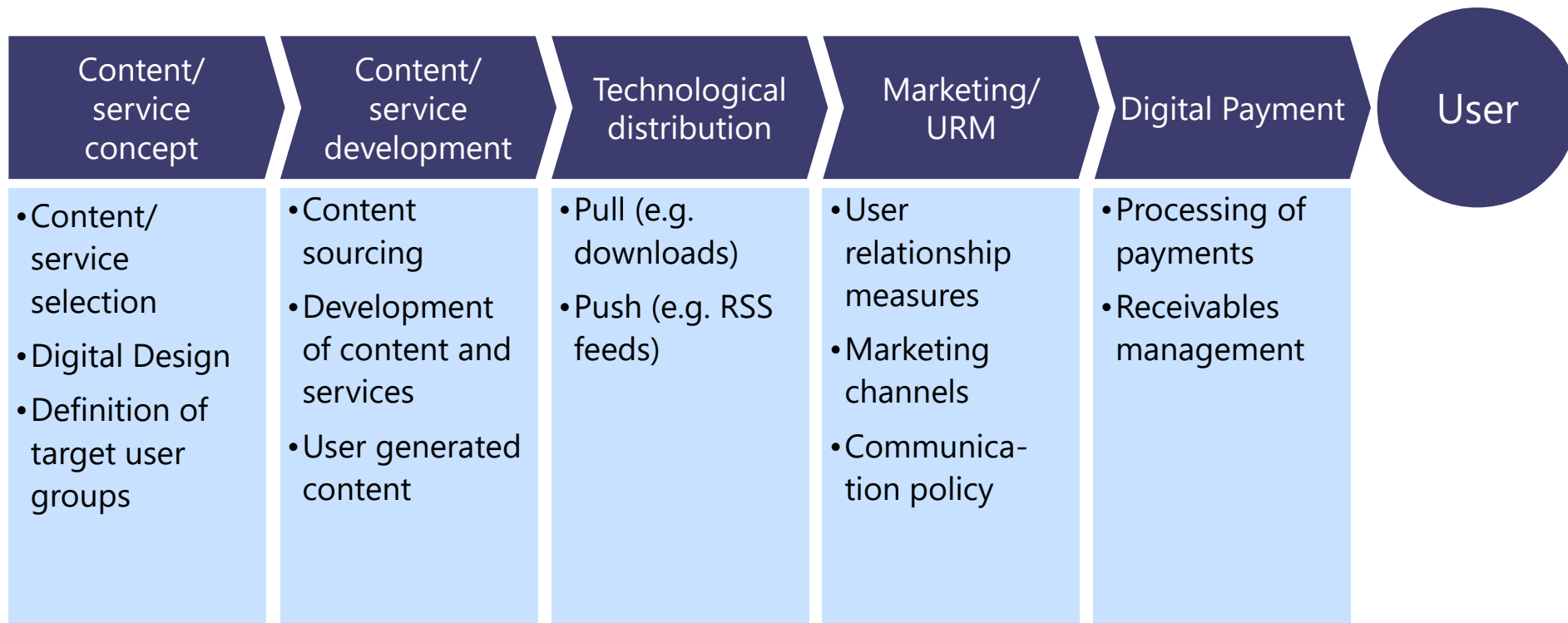
# **Chapter 3: The Concept and Strategy of Digital Government**

## Fig. 3.1 The Four Forces Modes of Digital Government



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

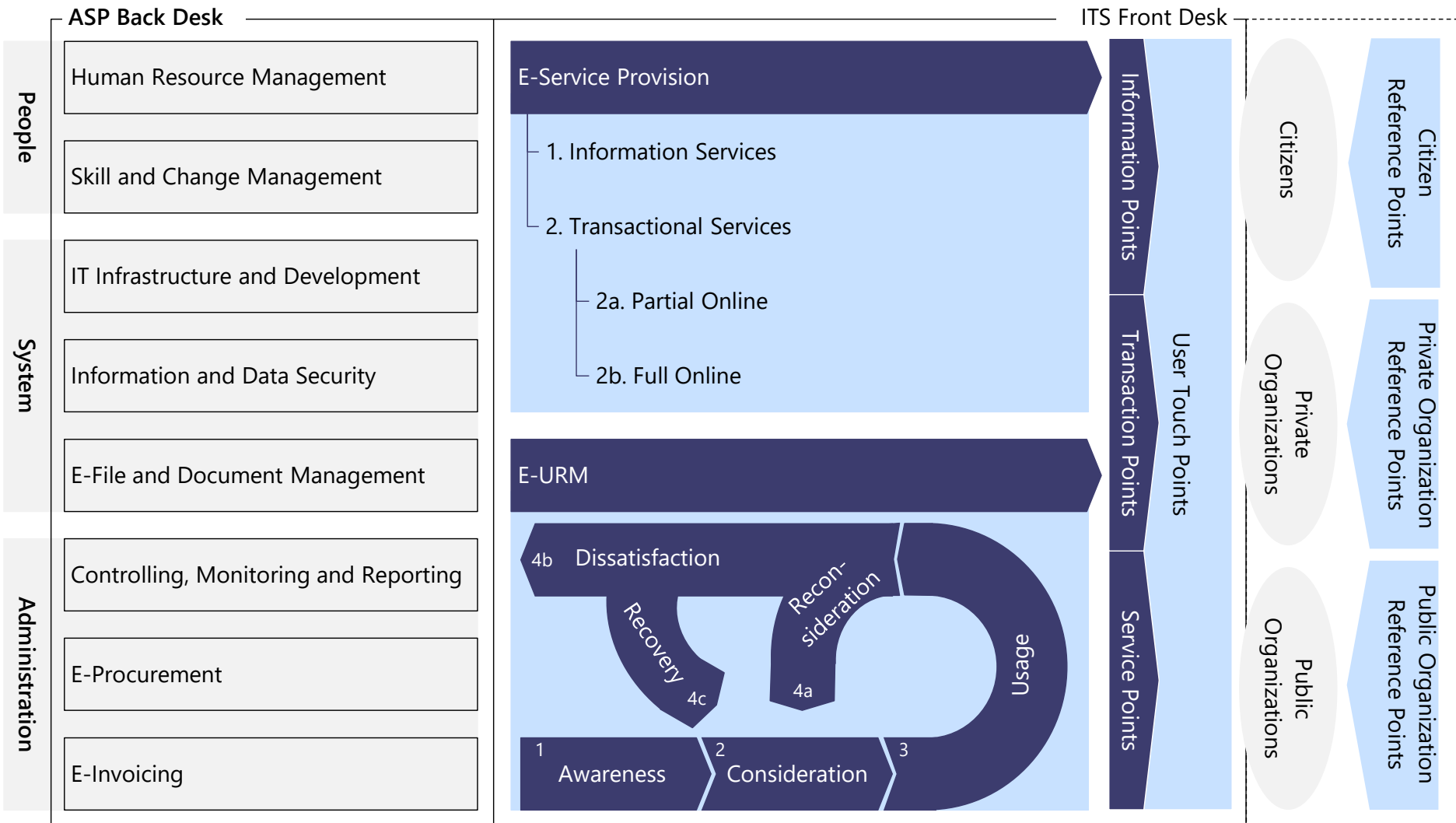
## Fig. 3.2 Exemplary digital government value chain



Source: Wirtz (2000, 2020b, 2021b, 2022)

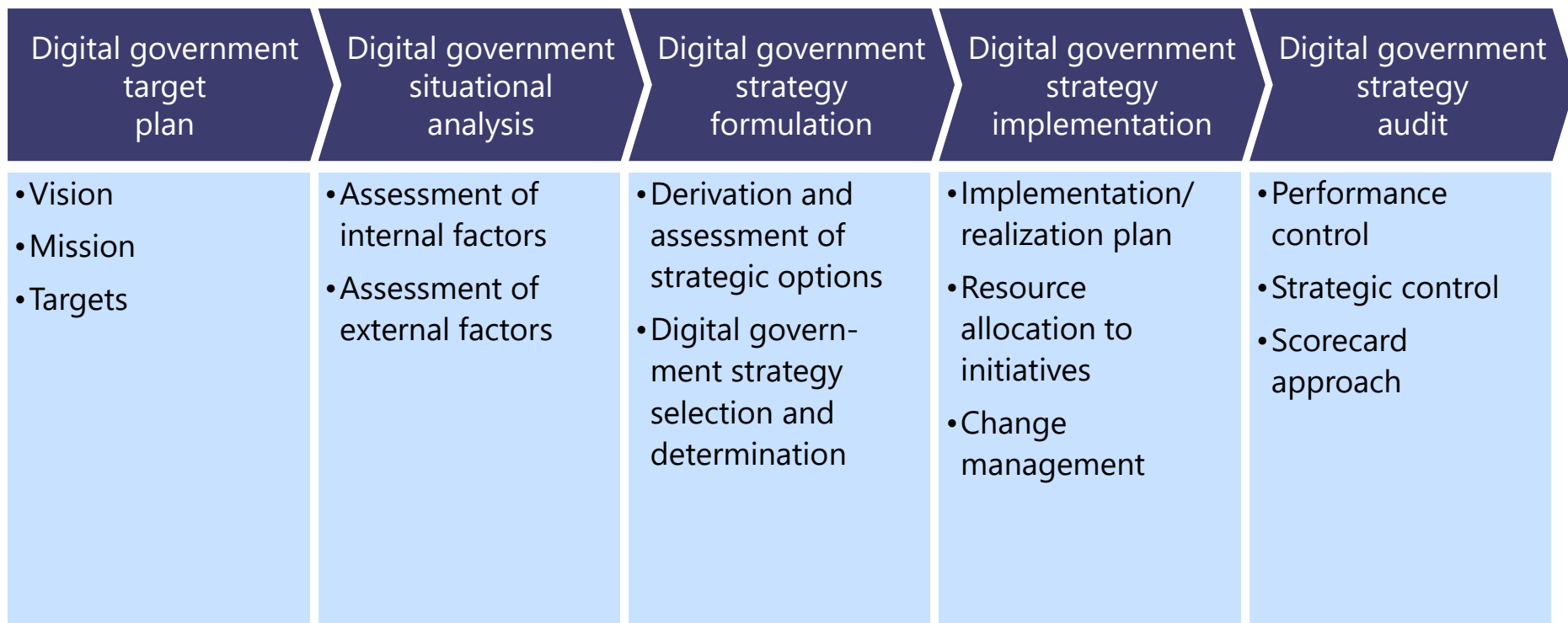


# Fig. 3.3 Model of E-Government Value Activity System (EVAS)



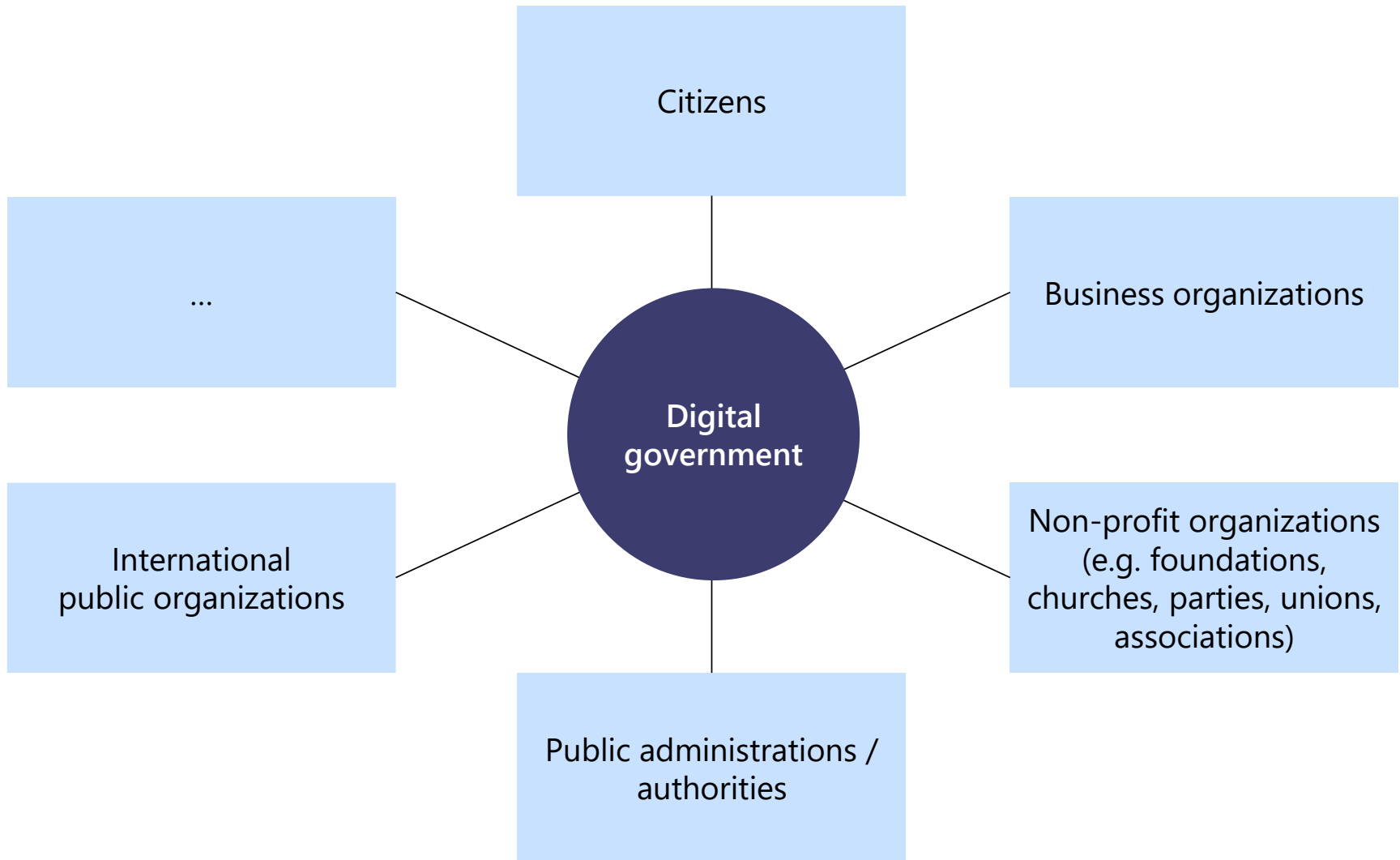
Source: Wirtz and Daiser (2015), Wirtz (2021b, 2022)

## Fig. 3.4 Taxonomy of digital government strategy development



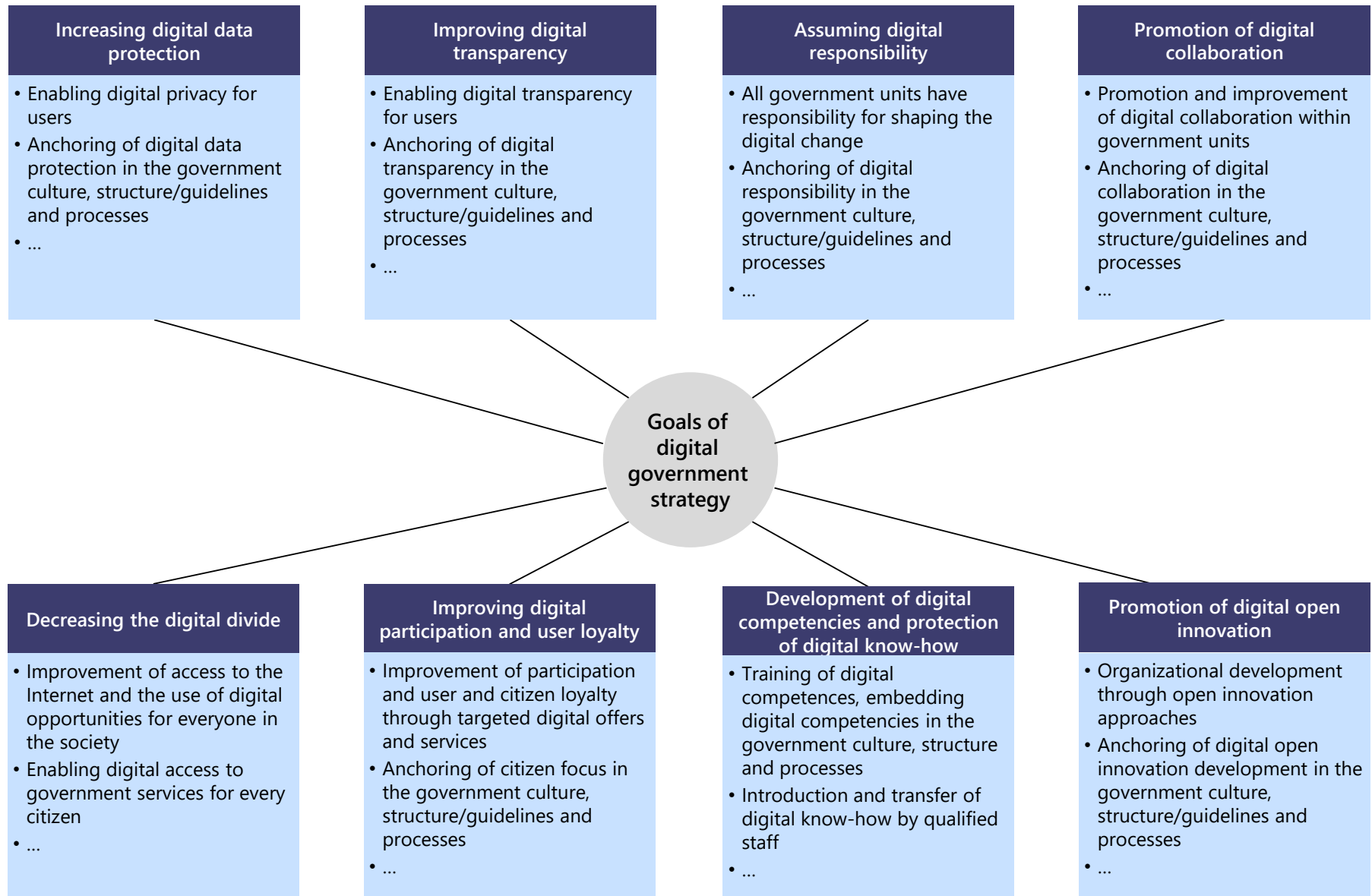
Source: Wirtz (2016, 2020b, 2021b, 2022)

**Fig. 3.5 Taxonomy of digital government stakeholders**



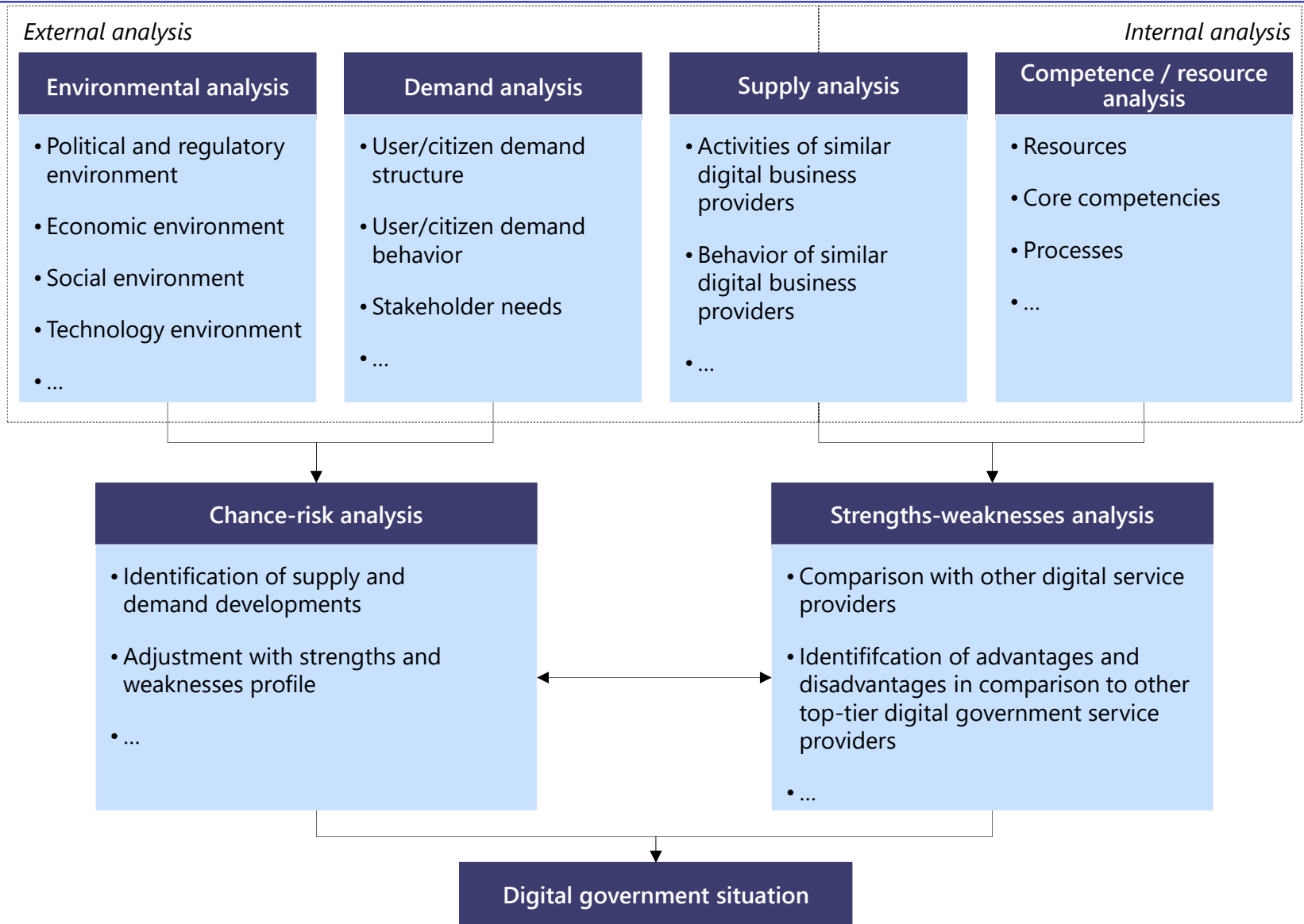
Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

## Fig. 3.6 Goals of digital government strategy



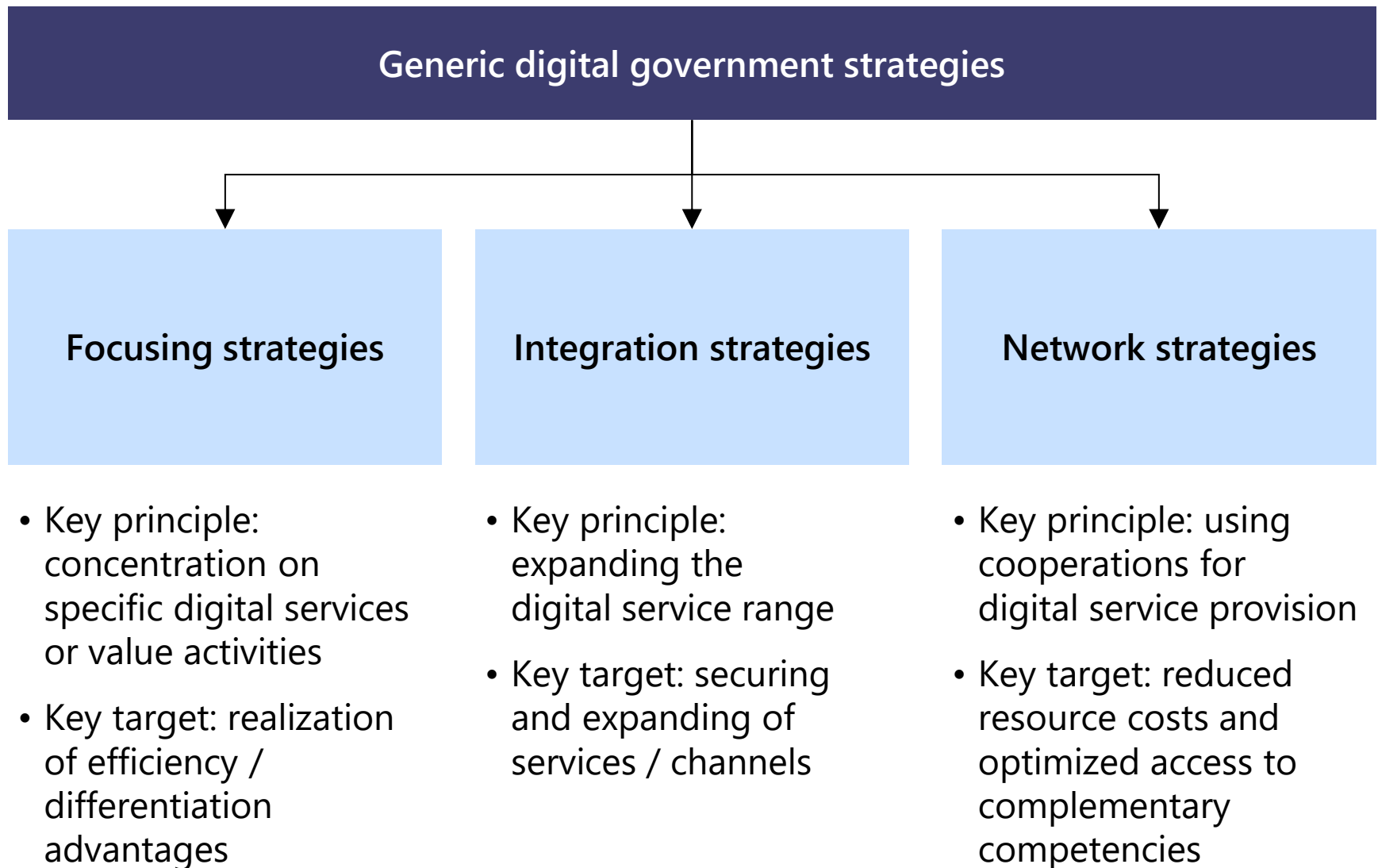
Source: Wirtz (2020b, 2021b, 2022)

## Fig. 3.7 Elements of the situational digital government analysis



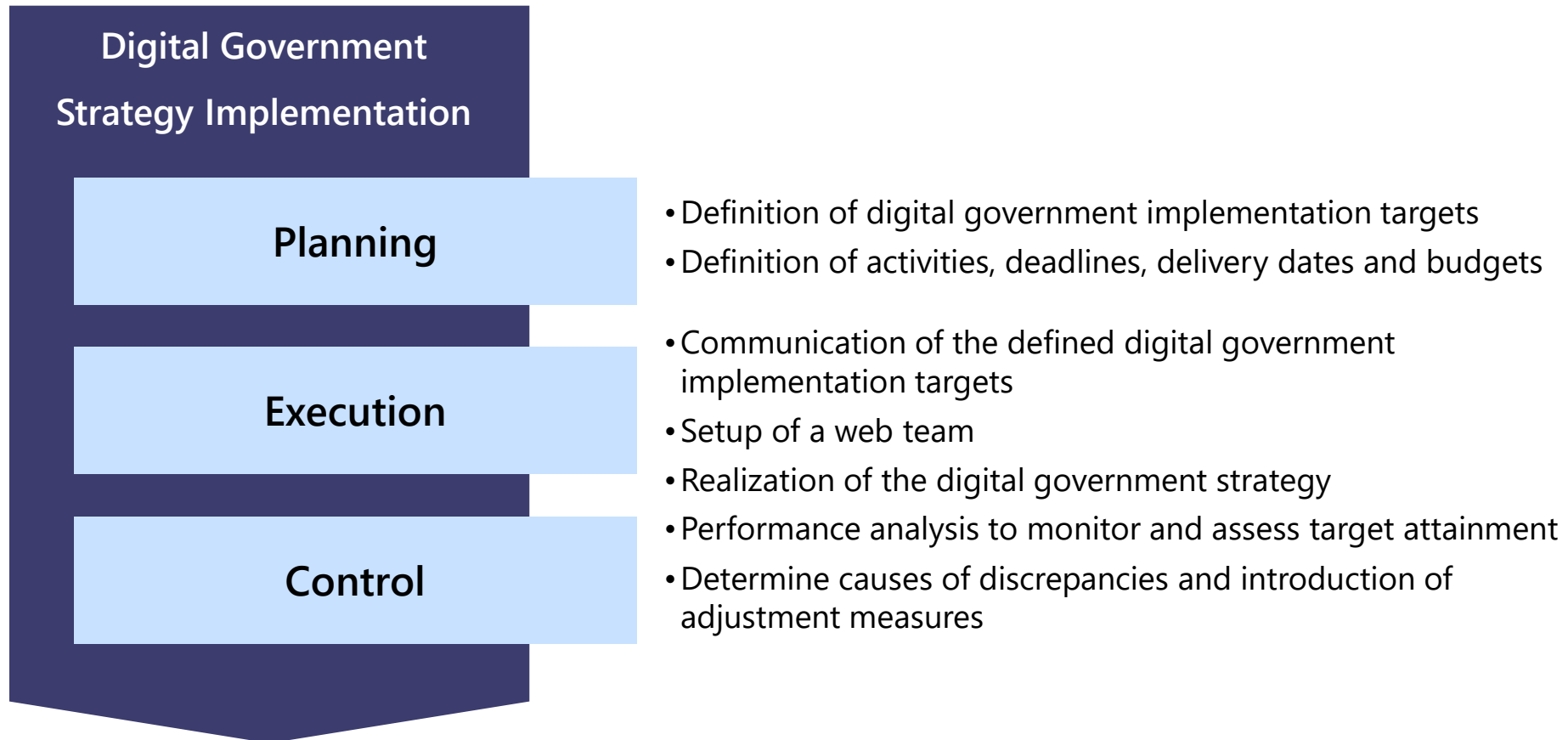
Source: Wirtz (2001, 2010b, 2021b, 2022)

**Fig. 3.8 Generic digital government strategies**



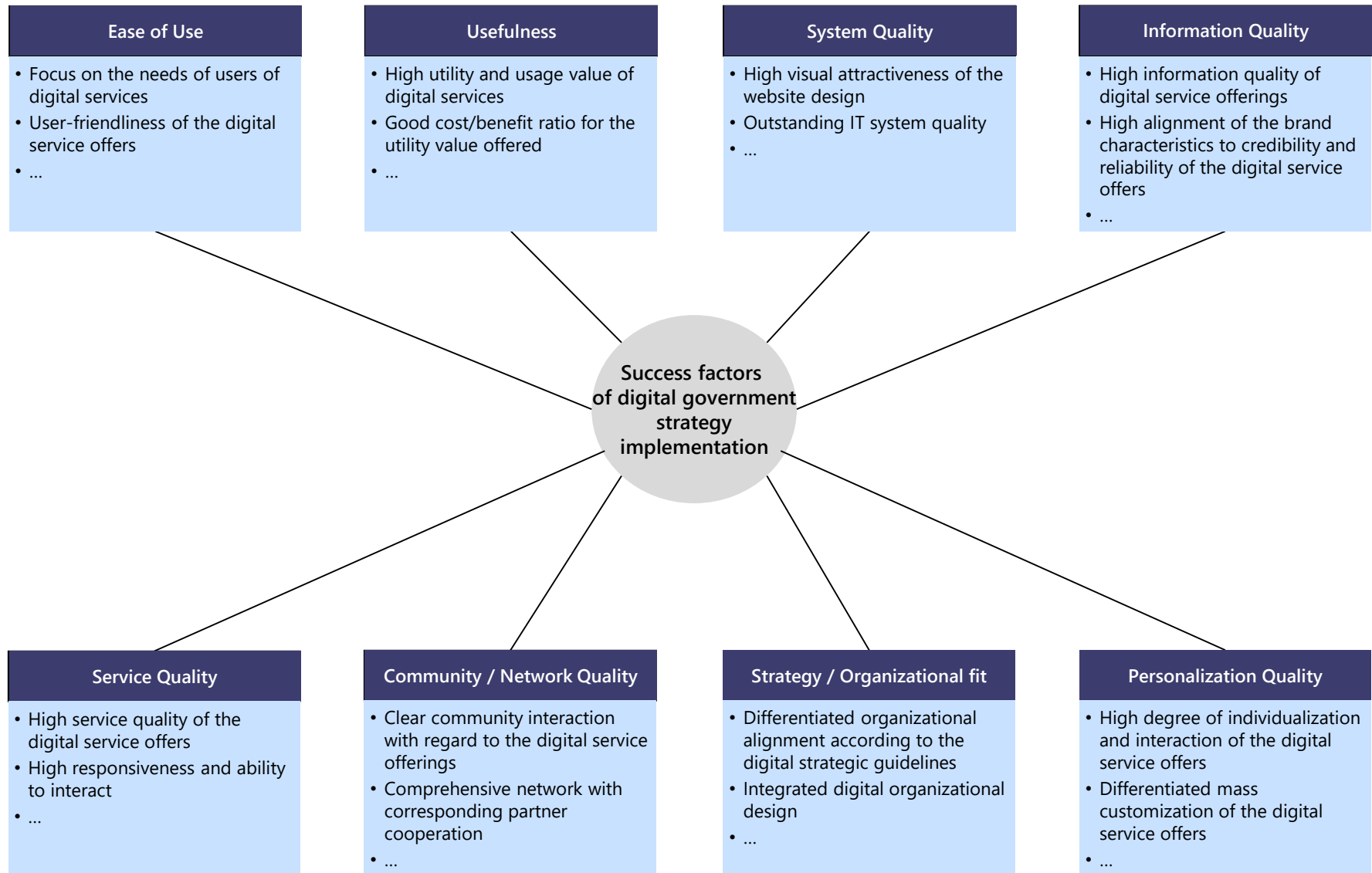
Source: Wirtz (2006, 2001b, 2020c, 2022)

## Fig. 3.9 Digital government implementation phases



Source: Wirtz (2010b, 2020b, 2021b, 2022)

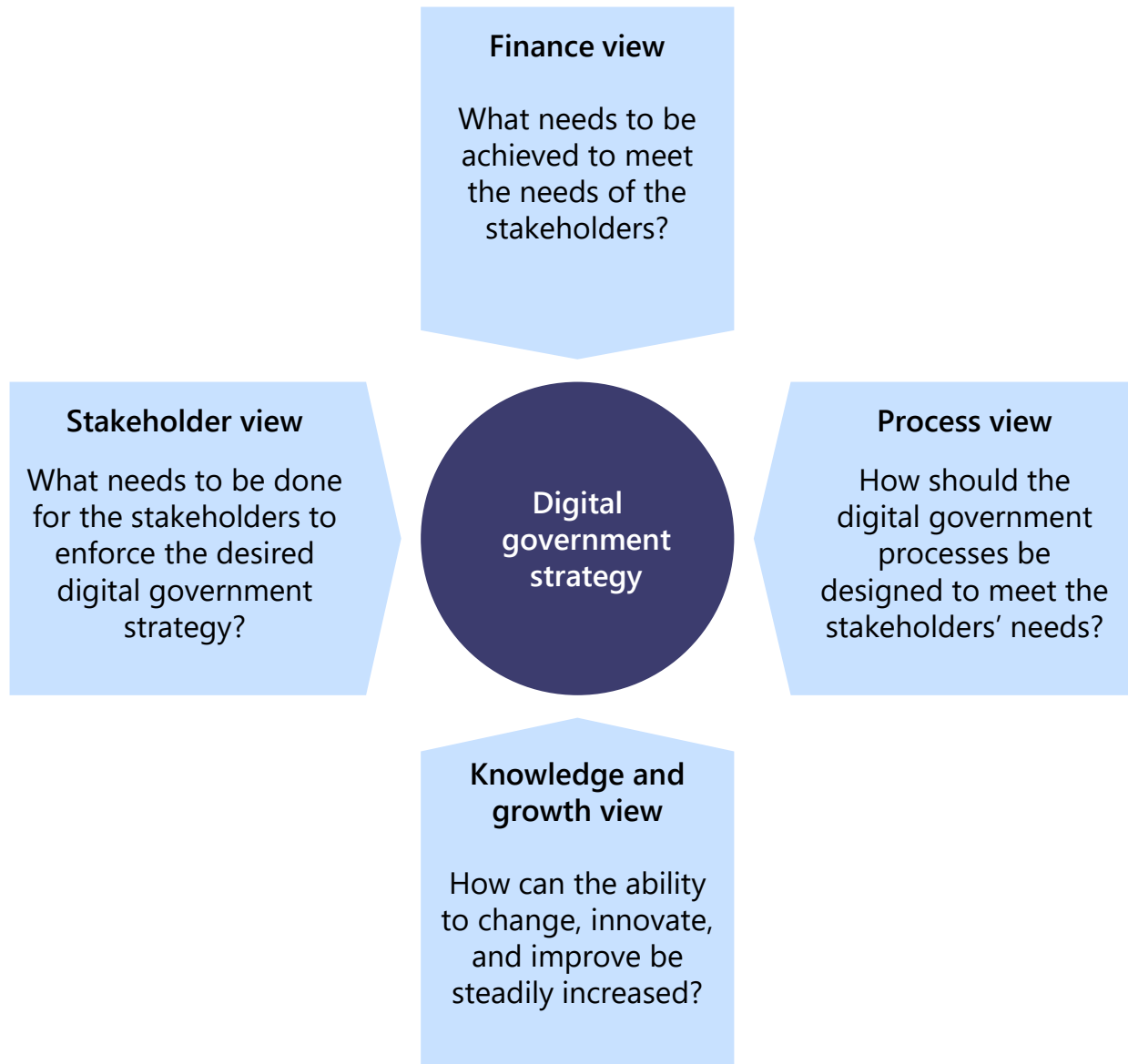
## Fig. 3.10 Success factors of digital government strategy implementation



Source: Wirtz (2020b, 2021b, 2022)



## Fig. 3.11 Dimensions of the digital government strategy scorecard



Source: Wirtz (2016, 2018, 2011b, 2022)

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Assets are tangible and intangible resources that form the basis for the activities and the competitiveness of a public sector organization. Core assets concern public sector organization-specific assets that were accumulated in-house or were at least refined and that have a special intrinsic value for a public sector organization's value creation process. They are relatively scarce and are difficult to imitate or substitute. Core assets form the basis for a lasting digital government advantage.

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Source: Wirtz (2011b, 2020b, 2022)

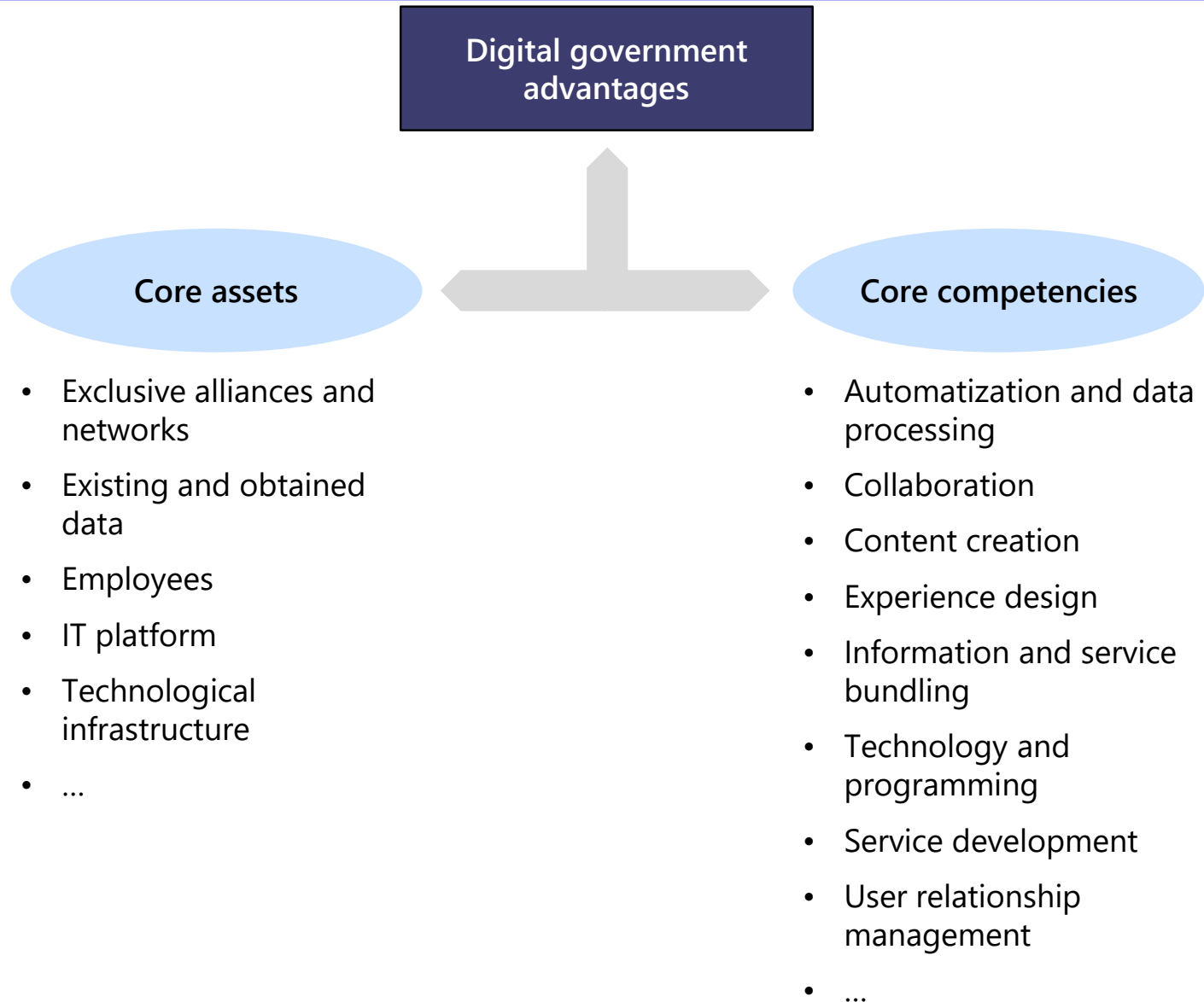
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Competencies form the foundation for the collective action in a public sector organization and facilitate the service creation process, in which assets and core assets are combined into valuable services. Core competencies are a special form of competencies. They are relatively scarce and do not lend themselves to imitation or substitution by the competition. Core competencies make a significant contribution to the perceived user benefits and provide public sector organizations with a lasting digital government advantage.

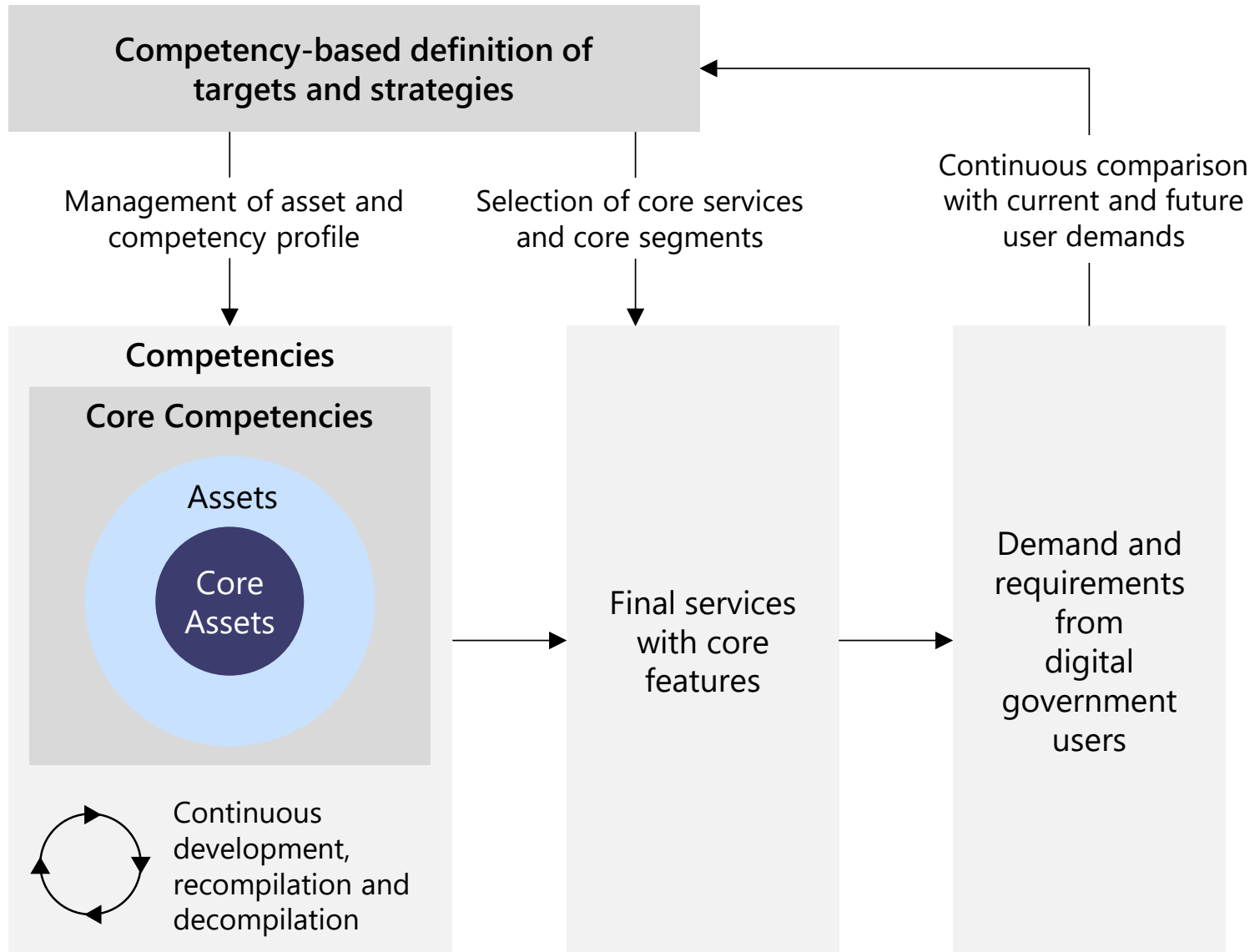
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Source: Wirtz (2011b, 2020b, 2022)

## Fig 3.12 Digital government-related core assets and core competences



**Fig 3.13 Core assets and core competency development**



Source: Wirtz (2005b, 2019b, 2022)

## Table 3.1 Selected definitions of open government

Author(s)	Definition
OECD (2009)	“Open and responsive government refers to the transparency of government actions, the accessibility of government services and information, and the responsiveness of government to new ideas, demands and needs.”
Geiger and von Lucke (2012)	“Open Government acts as an umbrella term for many different ideas and concepts. The narrow definition of Open Government consists of transparency, participation and collaboration of the state towards third actors like the economy or the citizenship.”
Harrison et al. (2012)	“Broader access to government data and other documentation, the ability to contribute to decision-making processes within government agencies, and the possibility of responsible engagement with agency leadership in such processes are incrementally more democratic actions that lie at the heart of the open government vision.”
Meijer et al. (2012)	“Openness of government is the extent to which citizens can monitor and influence government processes through access to government information and access to decision-making arenas.”
Evans and Campos (2013)	“Open government is widely understood as the leveraging of information technologies to generate participatory, collaborative dialogue between policymakers and citizens.”
Wirtz and Birkmeyer (2015)	“Open government is a multilateral, political, and social process, which includes in particular transparent, collaborative, and participatory action by government and administration.”

Source: Wirtz (2017b, 2021b, 2022)

# Definition of Open Government

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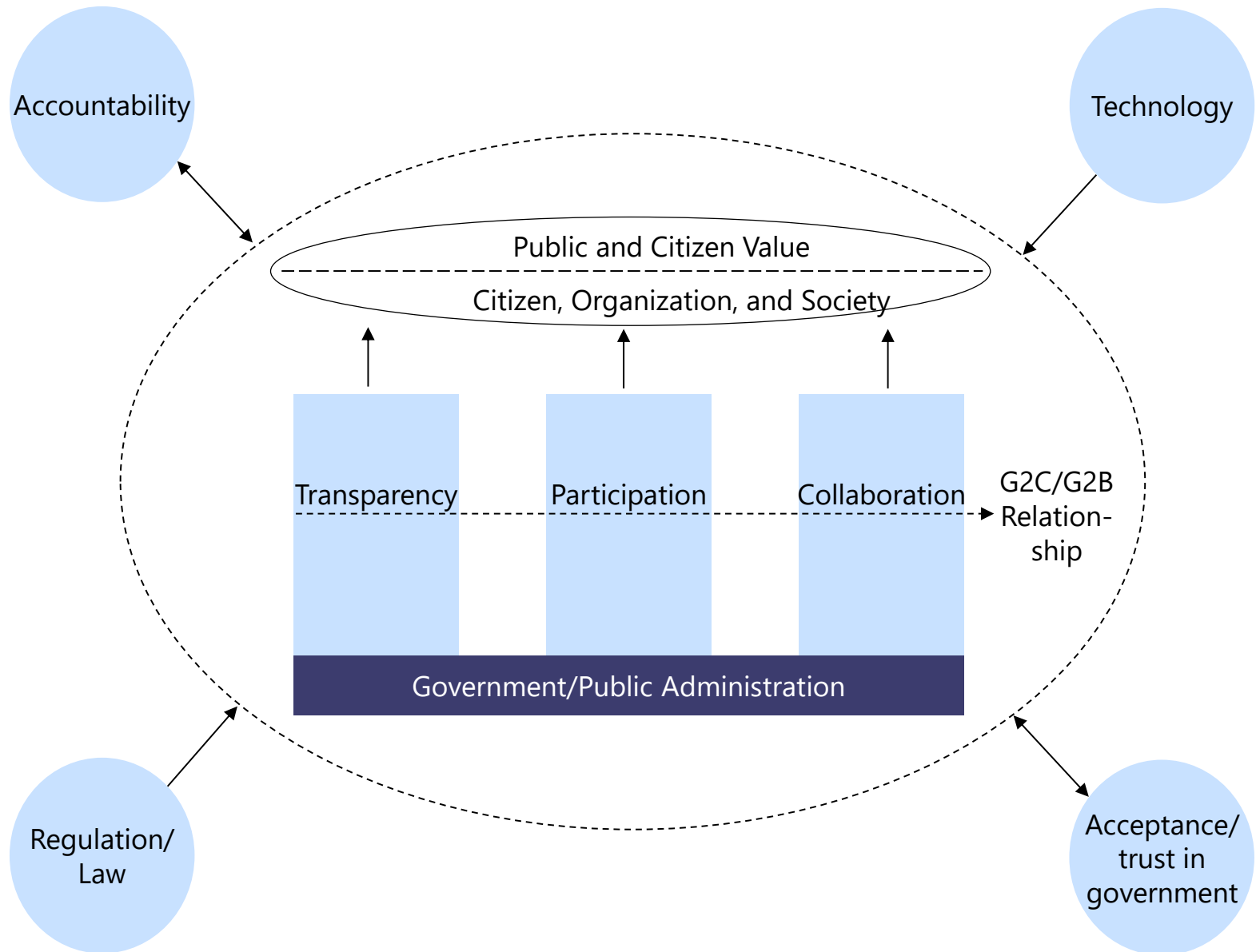
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Open government is a concept that generates a transparent, participatory, collaborative, and innovative government environment by providing existing data and knowledge to third parties and integrating external knowledge into political and administrative processes.

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Source: [Wirtz et al. \(2017a\)](#), [Wirtz \(2022\)](#)

**Fig. 3.14 Open government framework**





## Table 3.2 Definition of E-Participation

Author(s)	Definition
OECD (2003)	E-participation as an electronic form of active participation is “a relationship based on partnership with government in which citizens actively engage in defining the process and content of policy-making. It acknowledges equal standing for citizens in setting the agenda, proposing policy options and shaping the policy dialogue – although the responsibility for the final decision or policy formulation rests with government.”
Macintosh (2006)	E-participation is “the use of information and communication technologies to broaden and deepen political participation by enabling citizens to connect with one another and with their elected representatives.”
Sæbø et al. (2008)	“eParticipation involves the extension and transformation of participation in societal democratic and consultative processes mediated by information and communication technologies (ICT), primarily the Internet. It aims to support active citizenship with the latest technology developments, increasing access to and availability of participation in order to promote fair and efficient society and government.”

Source: Wirtz and Daiser (2017b), Wirtz (2021b, 2022)

# Definition of E-Participation

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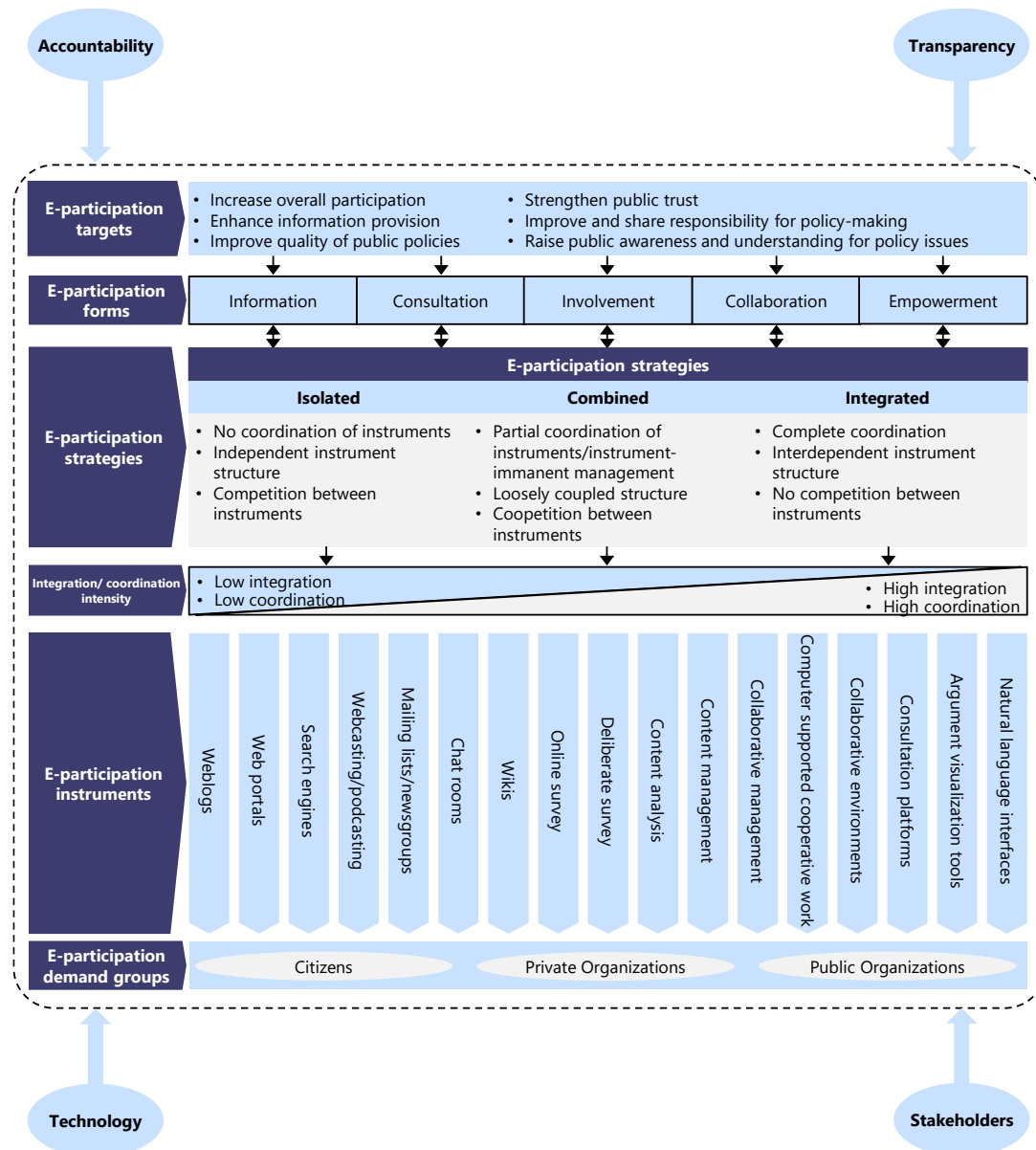
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E-participation is a participatory process that is enabled by modern information and communication technologies, includes stakeholders in the public decision-making processes through active information exchange, and thus fosters fair and representative policy-making.

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Source: [Wirtz et al. \(2016a\)](#), [Wirtz \(2022\)](#)

# Fig. 3.15 Integrated strategic e-participation framework



Source: Wirtz and Daiser (2017b), Wirtz (2021b, 2022)

# Chapter 3

## Review questions, topics for discussion and online exercises

### Chapter 3

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Describe the Four Forces Model of Digital Government.
2. Explain the digital government value chain and the EVAS Model.
3. Describe the digital government strategy development step by step.
4. List the goals of digital government strategy.
5. Explain the open government framework and the strategic e-participation framework.



##### Topics for classroom discussion and team debates

1. Discuss on the basis of the four forces which force is the most important one. Should citizen empowerment on the Internet be applied more extensively by users in order to make digital government providers aware of their preferences?
2. Discuss whether the fast moving digital society even requires a long-term strategy. Is a short-term adaptation not the more effective approach?
3. Discuss to what extent e-participation contributes to an improvement of political and social processes?

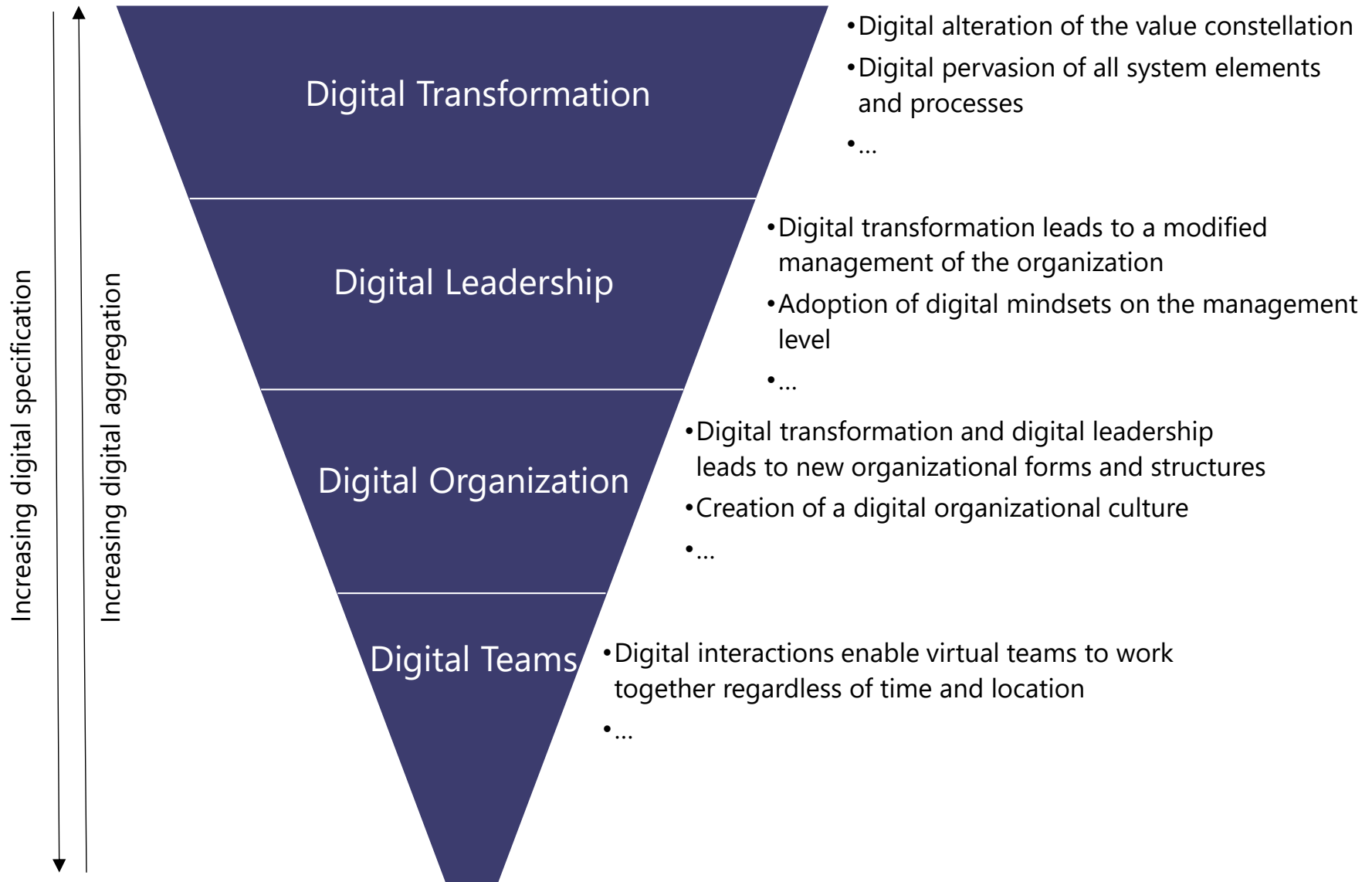


##### Online Exercises

1. Visit <https://open.usa.gov/>. Look at the topics of the U.S. National Action Plans and discuss whether these are the essential elements to put open government into practice.
2. Access <https://e-estonia.com/>. Work out the essential cornerstones of the E-Estonia strategy.
3. Visit <https://www.gov.uk/government/publications/uk-digital-strategy>. Explore the site. What are the main cornerstones? Compare them to the strategic cornerstones you found at <https://e-estonia.com>.

# **Chapter 4: Digital Transformation and Digital Organization**

## Fig. 4.1 Digital transformation pyramid



## Table 4.1 Selected definitions of digital transformation (1)

Author(s)	Definition
<b>Capgemini Consulting (2011)</b>	Digital transformation (DT) – the use of technology to radically improve performance or reach of enterprises – is becoming a hot topic for companies across the globe. Executives in all industries are using digital advances such as analytics, mobility, social media and smart embedded devices – and improving their use of traditional technologies such as ERP – to change customer relationships, internal processes, and value propositions.
<b>Bouée and Schaible (2011)</b>	We understand digital transformation as the consistent interconnectedness of all industrial sectors and the adaptation of the actors to the new conditions of the digital economy. Decisions in interconnected systems include the data exchange and analysis, the calculation and evaluation of options as well as the initiation of actions and consequences.

Source: Wirtz (2020b, 2021b, 2022)

## Table 4.1 Selected definitions of digital transformation (2)

Berghaus and Back (2016)	Digital transformation is a technology-induced change on many levels in the organization that includes both the exploitation of digital technologies to improve existing processes, and the exploration of digital innovation, which can potentially transform the business model.
Kofler (2018)	From a societal perspective, the digital transformation is omnipresent and affects every individual - it is irrevocable. We are all affected and actively drive this continuous change in different roles (for instance as customers, developers, employees, scientists) without any foreseeable end.

Source: Wirtz (2020b, 2021b, 2022)



# Definition of Digital Transformation

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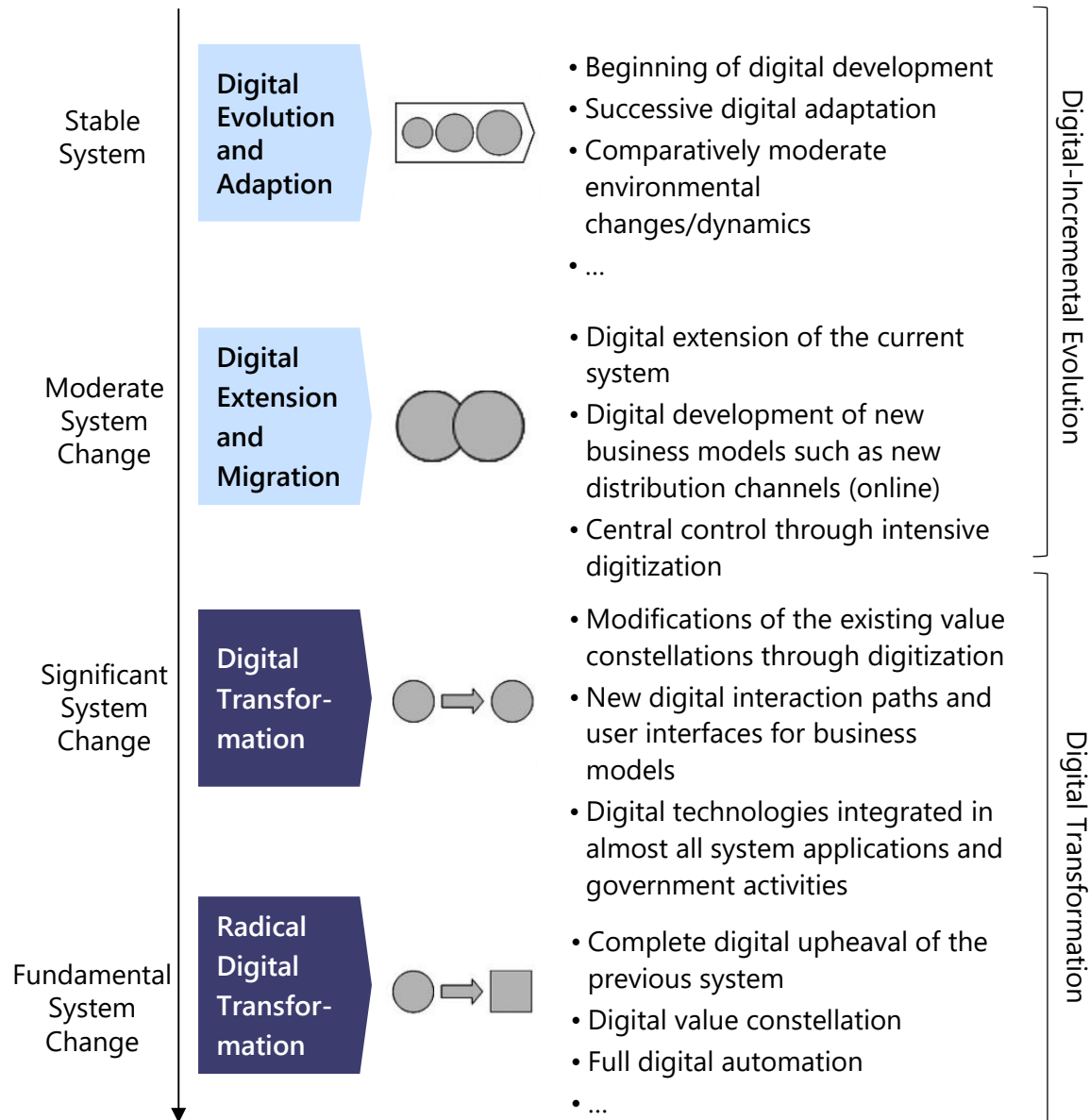
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The digital transformation represents the fundamental change and transformation of economy and society towards a digital-based economic and social system. In this process, all economic and social structures and processes are significantly supported and shaped by digital technologies with the aim of improving efficiency and effectiveness at a higher level of welfare.

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Source: [Wirtz \(2020b, 2021b, 2022\)](#)

## Fig. 4.2 Phases of digital development and transformation



## Table 4.2 Definitions of digital leadership (1)

Author(s)	Definition
<b>Buhse (2012)</b>	Digital Leadership as a form of management that not only masters the old management basics, but is also able to abstract old leadership concepts and recipes for success, compare them with the new values and success models from the digital world and then use them (two-handed leadership). In addition to their traditional role, digital leaders are also required to act as moderators, bridge builders and organizers of networks.
<b>El Sawy et al. (2016)</b>	We define digital leadership as doing the right things for the strategic success of digitalization for the enterprise and its business ecosystem.
<b>Petry (2018)</b>	The five characteristics of network, openness, participation, agility plus trust form the so called NOPA+ model of digital leadership.

Source: Wirtz (2020b, 2021b, 2022)

## Table 4.2 Definitions of digital leadership (2)

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<b>Hensellek (2020)</b>	Digital leadership is a reciprocal concept that is not only tied to top management positions in the sense of a top-down approach, but also refers to the active involvement of employees at lower hierarchical levels
<b>Doyé (2018)</b>	Digital leadership means using the collective intelligence of employees and peers (swarm intelligence) with decentralized leadership.

Source: Wirtz (2020b, 2021b, 2022)

# Definition of Digital Leadership

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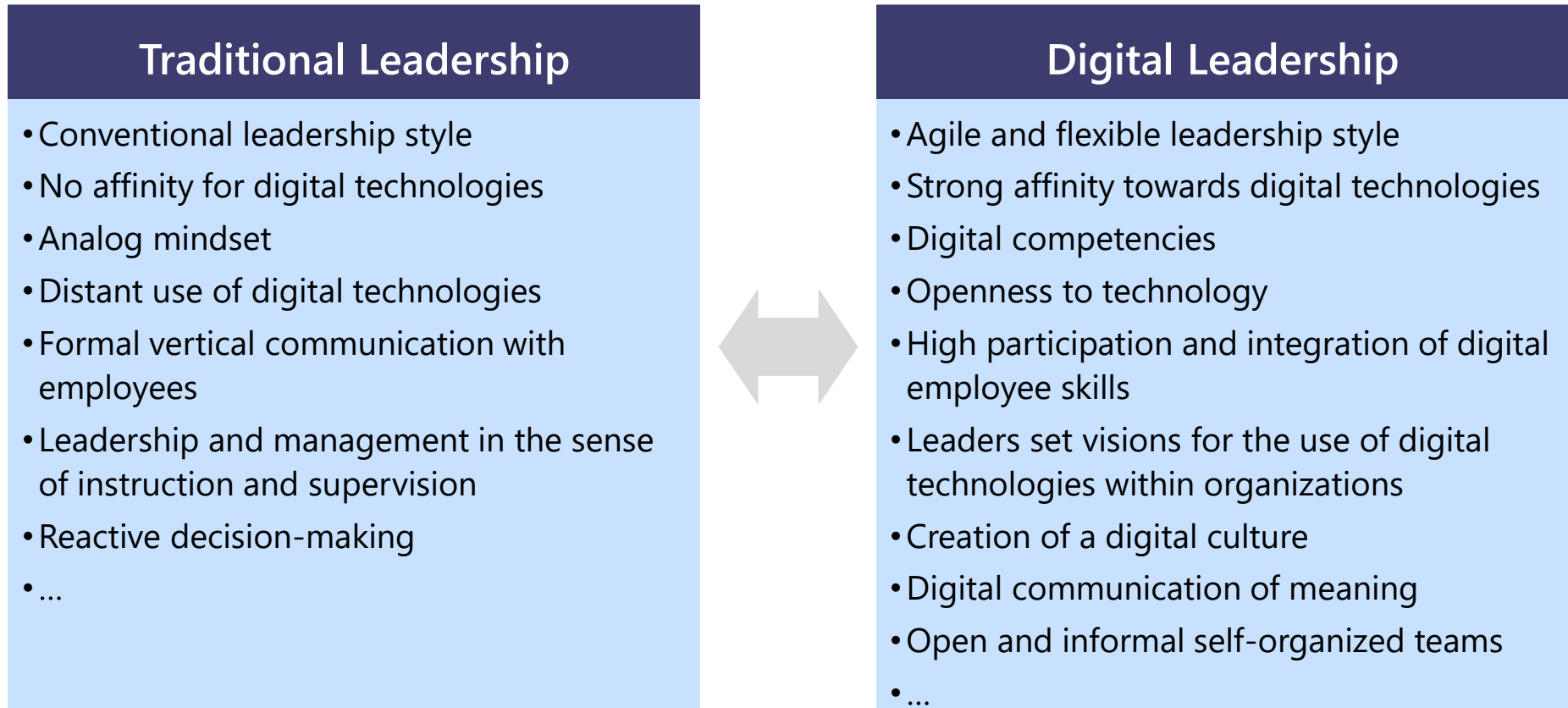
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Digital leadership characterizes the leadership of organizational systems and actors based on the comprehensive application of digital technologies. Specific features of digital leadership are high agility, networking, participation, flexibility and responsiveness to external environmental and internal organizational changes. The objective of digital leadership is to achieve greater effectiveness and efficiency in activities.

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Source: [Wirtz \(2020b, 2021b, 2022\)](#)

**Fig. 4.3 Traditional leadership vs. digital leadership**



Source: Wirtz (2020b, 2021b, 2022)

## Table 4.3 Selected definitions of digital/virtual organization (1)

Author(s)	Definition
<b>Wirtz (1995)</b>	A virtual organization can be understood as a temporary network of independent companies (suppliers, co-producers, distributors, but also customers or competitors), which is linked via modern information and communication technologies in order to transfer knowledge (know-how), supplement skills and share costs to open up new product areas and markets.
<b>Mertens and Faisst (1996)</b>	A virtual organization is based on a network of companies that quickly join forces (dynamic configuration and reconfiguration) to take advantage of a competitive opportunity.
<b>Picot et al. (1998)</b>	The virtual enterprise presents itself as a dynamic network. [...] Virtual enterprises are created through the networking of location-distributed organizational units that are involved in a coordinated value-added process based on the division of labor.

Source: Wirtz (2020b, 2021b, 2022)

## Table 4.3 Selected definitions of digital/virtual organization (2)

<b>Tucci (2011)</b>	A digital enterprise is an organization that uses technology as a competitive advantage in its internal and external operations.
<b>Accenture Consulting (2017)</b>	A digital enterprise is connected and dynamic, flexible enough to embrace continuous change. It uses connected platforms, analytic insights, collaboration and modular operating models to increase productivity, speed and responsiveness while putting customers at the center of whatever it does.
<b>Snow et al. (2017)</b>	A fully digital enterprise is a powerful combination of people, technology, and organizing ability that is well suited to today's economic and social environment.

Source: Wirtz (2020b, 2021b, 2022)



# Definition of digital organization

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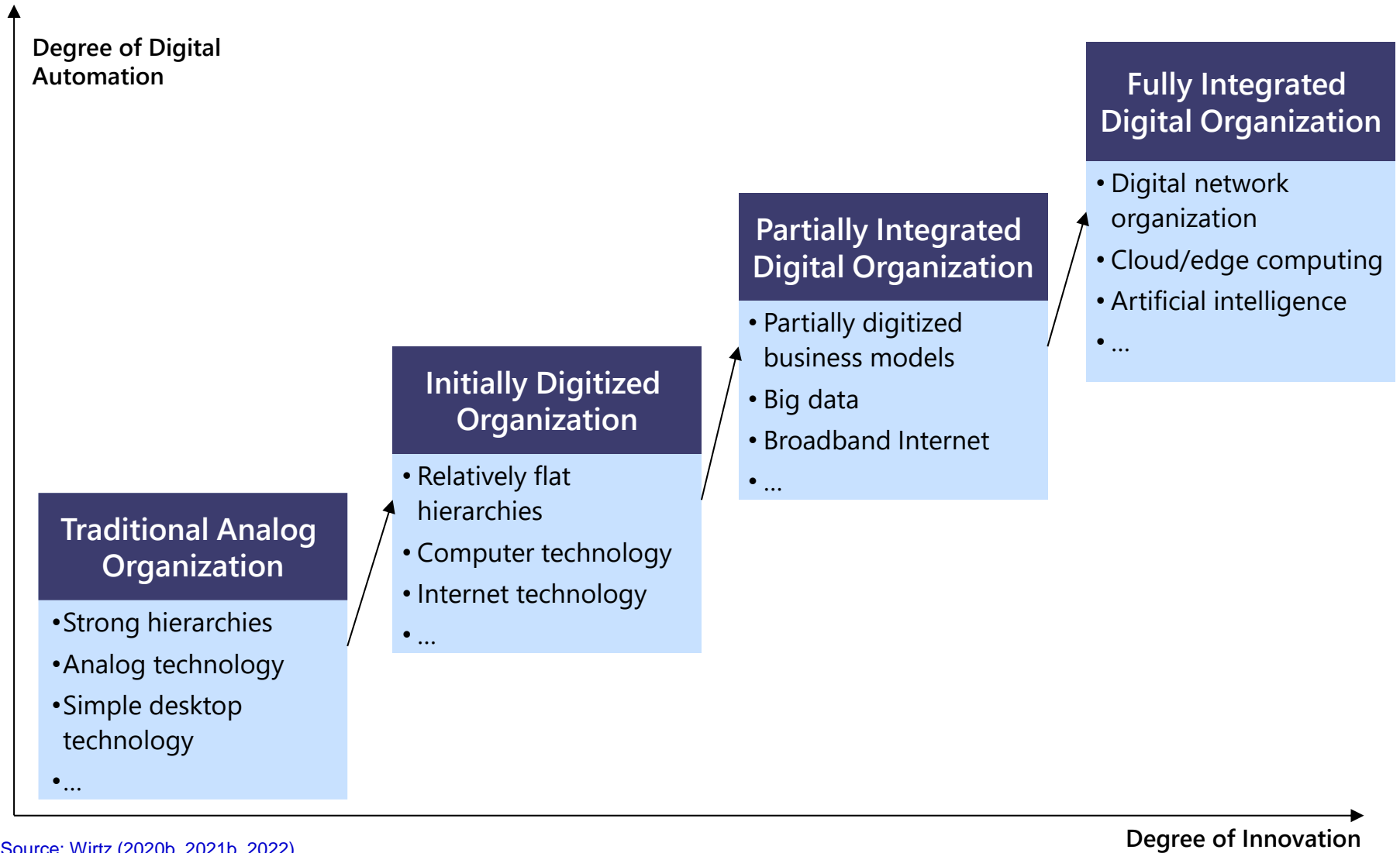
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The digital organization is an organization that is supported by digital information technologies in all essential areas of activities and digitizes all core processes. It thus has a digital-organizational end-to-end structure (value-added organization from the supplier interface to the customer interface). The digital organization uses digital technologies to achieve a sustainable, technology-based competitive advantage.

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Source: Wirtz (2020b, 2021b, 2022)




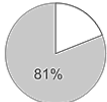


## Fig. 4.4 Development stages of digital organizations



# Fig. 4.5 Organizational and technological characteristics of the different development stages of digital organizations


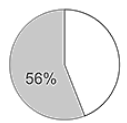

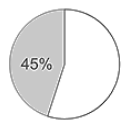

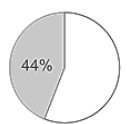

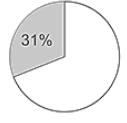
	Traditional Analog Organization	Initially Digitized Organization	Partially Integrated Digital Organization	Fully Integrated Digital Organization
Organizational Characteristics	<ul style="list-style-type: none"> <li>• Primary organization</li> <li>• Single-line or multi-line system</li> <li>• Strong hierarchy</li> <li>• Analog mindset</li> <li>• Analog business model</li> <li>• Central responsibility</li> <li>• Process orientation</li> <li>• Low integration or participation of users/customers</li> <li>• Concentration of specialists</li> <li>• Silo thinking</li> <li>• Formal vertical communication</li> <li>• Superior as sole directional control</li> <li>• Leadership and management in the sense of instruction and supervision</li> <li>• Reactive culture</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Secondary organization that completes/ transcends hierarchies</li> <li>• Rod line system</li> <li>• Focus on process standardization</li> <li>• Development culture</li> <li>• Establishment of intensive feedback loops</li> <li>• Relatively flat hierarchies</li> <li>• Focus on organizational stability</li> <li>• Low digital action, reaction and interaction capability</li> <li>• Responsible employees</li> <li>• Short and frequent communication cycles</li> <li>• Culture of cooperation</li> <li>• Manager as moderator between analogue and digital technologies</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Flat organizational structure</li> <li>• Flat hierarchies</li> <li>• Partially digitized business model</li> <li>• Digital integration and participation of users/customers</li> <li>• Focus on process optimization</li> <li>• Data based decision making</li> <li>• Moderate digital action, reaction and interaction ability</li> <li>• Electronic/digital collaboration</li> <li>• Decentralized responsibility</li> <li>• Supervisor as digital conveyor and enabler</li> <li>• Proactive organizational culture</li> <li>• Open informal and self-organized teams</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Digital network organization</li> <li>• Digital mindset/digital organizational culture</li> <li>• Digital business model/digital twin</li> <li>• Big data-based business activities and processes</li> <li>• Digital value chains</li> <li>• Digital interfaces</li> <li>• Digital cross-functional connections</li> <li>• High digital action, reaction and interaction capability</li> <li>• Digital transparency</li> <li>• Digitally based user/customer orientation</li> <li>• Focus on digital process automation</li> <li>• Digital collaboration</li> <li>• Use of agile methods</li> <li>• Digital flexibility and agility</li> <li>• Self-learning organization</li> <li>• Autonomous digital teams</li> <li>• ...</li> </ul>
Technological Characteristics	<ul style="list-style-type: none"> <li>• Analog data</li> <li>• Analog technology</li> <li>• Analog signal transmission</li> <li>• Simple desktop technology</li> <li>• Fax</li> <li>• Telephone</li> <li>• Printer</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic data processing</li> <li>• Data centers</li> <li>• Computer</li> <li>• Internet</li> <li>• Email</li> <li>• Floppy disks</li> <li>• CDs</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Big data</li> <li>• Predictive analytics</li> <li>• Computer-computer connection/cross communication (peer-to-peer-architecture)</li> <li>• In-memory-computing</li> <li>• Electronic collaboration Tools (Cisco Webex)</li> <li>• Videotelephony</li> <li>• Broadband Internet</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud/edge computing</li> <li>• Machine learning</li> <li>• Internet of things</li> <li>• Blockchain technology</li> <li>• Virtual, augmented and mixed reality</li> <li>• Artificial intelligence/ augmented intelligence</li> <li>• Hyper automation</li> <li>• Robotics</li> <li>• Neuromorphic hardware</li> <li>• Brain-computer interfaces</li> <li>• ...</li> </ul>

# Table 4.4 Digital technologies, instruments and methods in digital organizations (1)


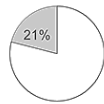

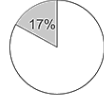

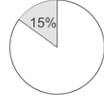
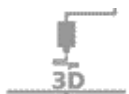
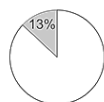
Digital technologies, instruments and methods	Description	Percentage of use in successful digital organizations
 Conventional Web Technologies	<ul style="list-style-type: none"> <li>• Active use of websites or online applications</li> <li>• Provision of websites and online applications</li> <li>• HTML</li> <li>• JavaScript</li> <li>• ...</li> </ul>	
 Cloud-based Services	<ul style="list-style-type: none"> <li>• Use of external storage capacities</li> <li>• Use of external computing power</li> <li>• Use of external software</li> <li>• Flexible and location-independent access to data, software and computing power</li> <li>• ...</li> </ul>	
 Mobile Internet Technologies	<ul style="list-style-type: none"> <li>• Location-independent access to nearly all contents of the Internet</li> <li>• High data transfer rates through 5G technology (10 Gigabit per second)</li> <li>• ...</li> </ul>	

Source: Wirtz (2020b, 2021b, 2022)

## Table 4.4 Digital technologies, instruments and methods in digital organizations (2)

 <p>Big Data and Big Data Architecture</p>	<ul style="list-style-type: none"> <li>• Effective and efficient analysis and processing of large, complex and partly unstructured data sets</li> <li>• Data-based decision making</li> <li>• ...</li> </ul>	
 <p>Internet of Things</p>	<ul style="list-style-type: none"> <li>• Interconnectedness of different physical and virtual objects via the Internet</li> <li>• The objects can communicate and interact autonomously via the Internet</li> <li>• ...</li> </ul>	
 <p>Design Thinking</p>	<ul style="list-style-type: none"> <li>• Method for solving complex problems</li> <li>• Application of creative techniques and technological tools</li> <li>• ...</li> </ul>	
 <p>AI Applications</p>	<ul style="list-style-type: none"> <li>• Automation of intelligence</li> <li>• Based on a variety of inputs the system learns to find the expected solutions to problems</li> <li>• E.g., in the form of language translation</li> <li>• ...</li> </ul>	

## Table 4.4 Digital technologies, instruments and methods in digital organizations (3)

 <p>Robotics</p>	<ul style="list-style-type: none"> <li>• Use of information technology, mechanical elements and electrical engineering to create a physical connection between a technical unit and the real environment</li> <li>• Interaction between electronics and mechanics</li> <li>• ...</li> </ul>	
 <p>Advanced Neural Machine Learning (Deep Learning)</p>	<ul style="list-style-type: none"> <li>• Artificial neural networks as information-technological replication of the human brain</li> <li>• Machine learning is the artificial generation of knowledge by machines</li> <li>• Subfield of artificial intelligence</li> <li>• ...</li> </ul>	
 <p>Augmented Reality</p>	<ul style="list-style-type: none"> <li>• Virtual extension of human perception</li> <li>• Fictional extension of the environment through digital information and symbols</li> <li>• ...</li> </ul>	
 <p>Additive Manufacturing (3D Printing)</p>	<ul style="list-style-type: none"> <li>• Computer-controlled successive generation of three-dimensional products</li> <li>• E.g., 3D printing</li> <li>• ...</li> </ul>	

Source: Wirtz (2020b, 2021b, 2022)

## Table 4.5 Selected definitions of digital/virtual teams (1)

Author(s)	Definition
<b>Jarvenpaa and Leidner (1999)</b>	A virtual team is an evolutionary form of a network organization (Miles and Snow 1986) enabled by advances in information and communication technology.
<b>Zaccaro and Bader (2003)</b>	The "virtual" team is another phrase that has recently entered prominently into our leadership lexicon. The term "virtual" is misleading because it suggests a degree of unreality, as if such teams exist only in the nether world of electrons. These are real teams having all of the characteristics, demands, and challenges of more traditional organizational teams. The differences reside in two key features. First, members of these new forms of organizational teams either work in geographically separated work places, or they may work in the same space but at different times. Still other teams have members working in different spaces and time zones, as is the case with many multinational teams. The second feature is that most, if not all, of the interactions among team members occur through electronic communication channels.

Source: Wirtz (2020b, 2021b, 2022)

## Table 4.5 Selected definitions of digital/virtual teams (2)

<b>Hertel et al. (2004)</b>	[...] virtual teams consist of two or more persons who collaborate to achieve common goals, while (at least) some of the team members work at different locations (or times) so that communication and coordination is predominantly based on electronic communication media (email, fax, phone, video conference, etc.).
<b>Malhotra et al. (2007)</b>	Virtual teams are teams whose members are geographically distributed, requiring them to work together through electronic means with minimal face-to-face interaction.
<b>Hewitt (2013)</b>	Digital teams are responsible for developing, testing, and implementing a strategy to reach and engage target audiences through digital channels like web, mobile, and social.

Source: Wirtz (2020b, 2021b, 2022)



# Definition of Digital Teams

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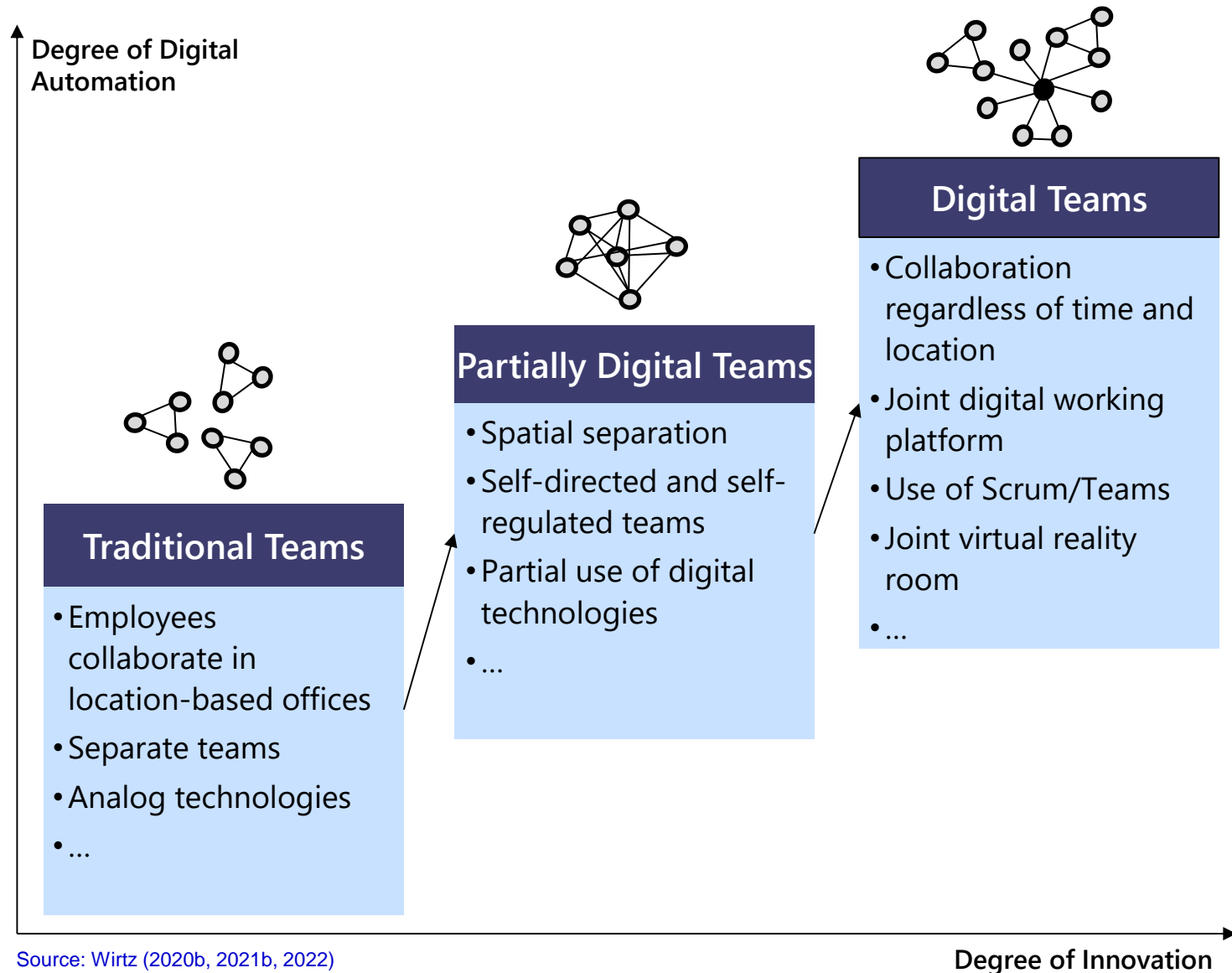
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A digital team is a working group of employees supported by digital information technologies in all essential areas of work, and in which all essential work processes are digitized. At the core of the digital team are digital working environments and platforms that enable agile and flexible collaboration regardless of time, location or people. Employees can work together interactively, simultaneously and in real time to complete tasks by means of digital technologies. Digital teams aim at achieving sustainable technology-based efficiency and effectiveness at the work level.

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Source: Wirtz (2020b, 2021b, 2022)

## Fig. 4.6 Development stages of digital teams



## Table 4.6 Selection of agile methods for digital teams (1)

Method	Concept	Core Aspects
<b>Design Thinking</b>	Design thinking is based on the assumption that problems can be solved better by interdisciplinary teams. The design thinking process can be divided into six phases, which are processed by interdisciplinary and most time in digital teams: understanding, observing, defining, ideating, prototyping, testing. These phases can be processed linearly or iteratively. The visualization is mostly done in digital form and enables working in digital teams.	<ul style="list-style-type: none"> <li>• Interdisciplinary approach</li> <li>• Promotion of collaborative creativity</li> <li>• User / customer centricity</li> <li>• Digital visualization of the phases</li> <li>• Digital collaboration of the team</li> <li>• ...</li> </ul>

Source: Wirtz (2022)

## Table 4.6 Selection of agile methods for digital teams (2)

<b>Scrum</b>	<p>Scrum is an iterative method of product development. Within defined time periods (sprints), a team develops solutions to requirements specified by a product owner with the support of a scrum master. At the end of the sprint, the team, the product owner and the scrum master evaluate which solutions have been fully developed and which solutions need further development. Subsequently the next sprint starts. Scrum is often used in the digital context.</p>	<ul style="list-style-type: none"><li>• Iterative method of product development</li><li>• Within a defined period of time (sprint), a team develops solutions to requirements specified by the product owner</li><li>• After evaluation of the result the next sprint starts</li><li>• Scrum enables digital planning and implementation of digital teams</li><li>• ...</li></ul>
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Source: Wirtz (2022)

## Table 4.6 Selection of agile methods for digital teams (3)

<b>Kanban</b>	<p>Kanban is based on the assumption that tasks should be broken down into manageable subtasks. These subtasks are processed in a planned schedule. Often, the number of subtasks that can be processed simultaneously is limited. This planning process is often visualized in digital formats and enables the working in virtual teams.</p>	<ul style="list-style-type: none"><li>• Decomposition of tasks into subtasks</li><li>• Limitation of the tasks that can be processed at the same time</li><li>• Digital visualization of the subtasks</li><li>• Digital collaboration of the team</li><li>• ...</li></ul>
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Source: Wirtz (2022)

## Table 4.6 Selection of agile methods for digital teams (4)

Business Model Canvas	<p>The basic idea of Business Model Canvas is that a business model can be efficiently developed based on nine fields: customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partners and cost structure. The most important aspects are assigned to these fields in bullet points. This approach allows an easy comparison of different variants and identification of overlaps. Ideas can be visualized, discussed, developed and evaluated in digital teams using this approach.</p>	<ul style="list-style-type: none"> <li>• Decomposition of central aspects of a business idea into nine areas</li> <li>• Visualization of the aspects within the nine fields</li> <li>• Evaluation and further development of ideas based on visualization</li> <li>• Digital visualization</li> <li>• Digital collaboration</li> <li>• ...</li> </ul>
Rapid Prototyping	<p>Within the rapid prototyping process, a minimum valuable product is developed first. This minimum valuable product is made available to selected customers. The feedback received is used directly in further product development. The advantage of this method is faster product development. Rapid prototyping is used in particular in the digital context.</p>	<ul style="list-style-type: none"> <li>• Development of a minimum valuable product</li> <li>• Use of feedback for further development</li> <li>• Reduced development time</li> <li>• ...</li> </ul>

Source: Wirtz (2022)

## Table 4.6 Selection of agile methods for digital teams (5)

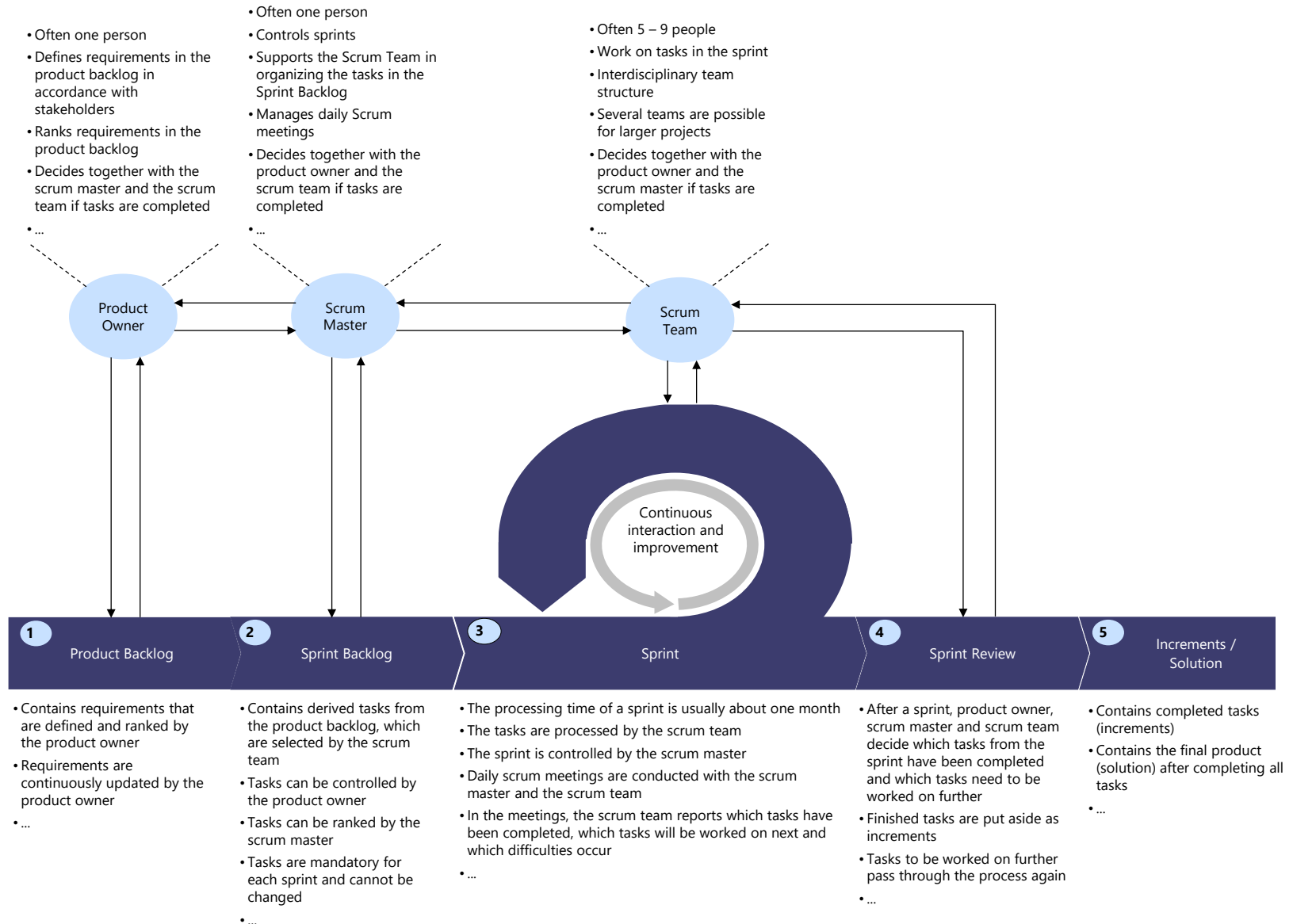
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<b>Hackathons</b>	Fast development of a prototype (usually within a period of a few days). This method is used in particular in the ICT sector. Meetings often take place in digital form.	<ul style="list-style-type: none"><li>• Development of a prototype within a short period of time</li><li>• Usage of ICT for digital collaboration</li><li>• ...</li></ul>
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Source: Wirtz (2022)

# Fig. 4.7 Structure and process of the Scrum method



Source: Wirtz (2022)



# Chapter 4

## Review questions, topics for discussion and online exercises

### Chapter 4

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Describe the digital transformation pyramid.
2. Explain the phases of digital development and transformation.
3. Distinguish digital leadership from traditional leadership.
4. What are the development stages of digital organizations? Name the technological and organizational characteristics of each stage.
5. Describe and explain the Scrum process.



##### Topics for classroom discussion and team debates

1. Discuss the socio-economic effects of digital transformation for your city.
2. Discuss the advantages and disadvantages of digital leadership in an open and democratic society against the background of traditional leadership.
3. Debate: Will the development towards digital organizations fundamentally change our understanding with regard to social systems and structures? Will digital development lead to the dissolution of traditional forms of organization?



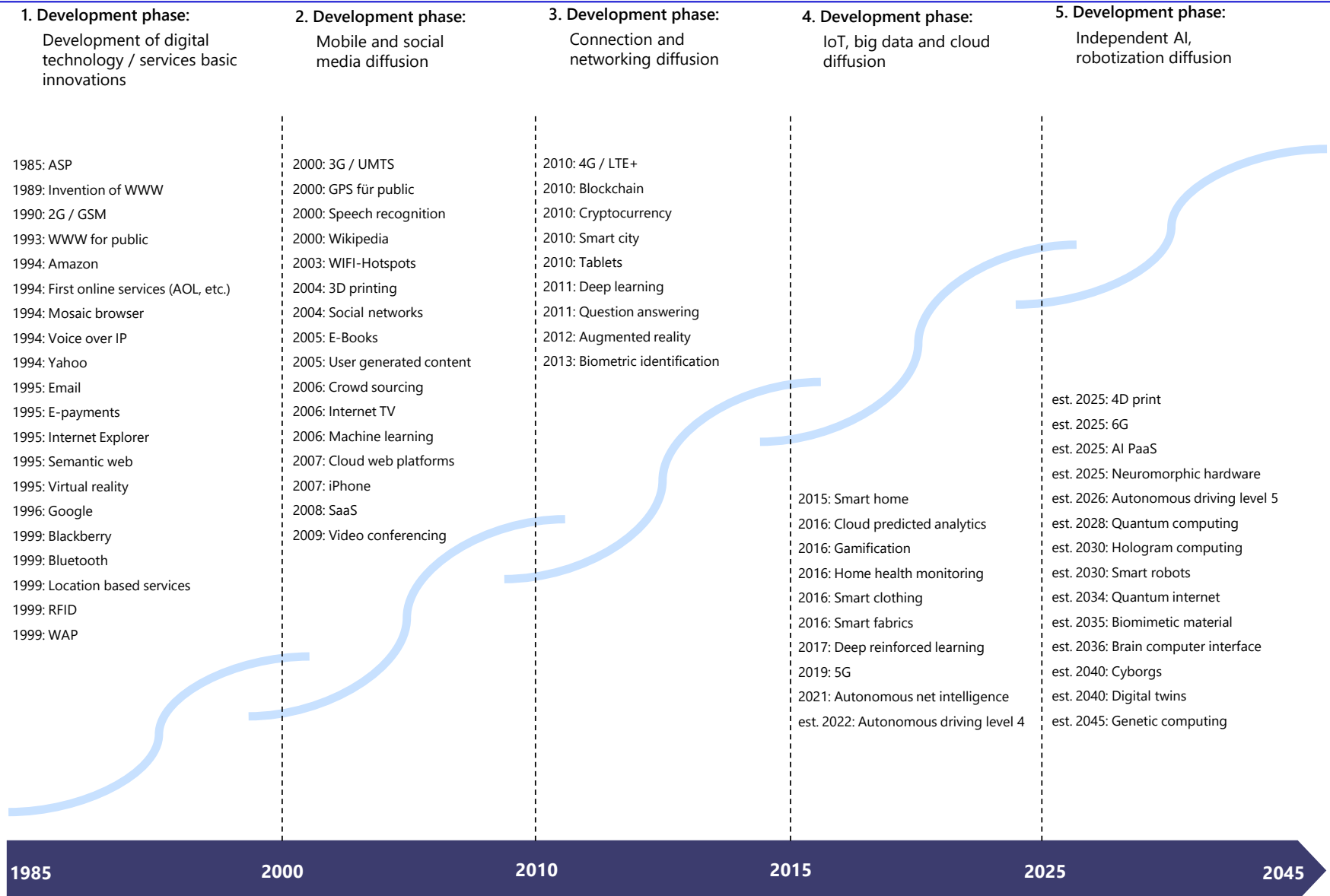
##### Online Exercises

1. Enter <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/digital-public-services-how-to-achieve-fast-transformation-at-scale> and explore the site. What are the key lessons learned about the transformation of digital public services from the perspective of a consulting firm?
2. Visit <https://www.oecd.org/governance/digital-government/toolkit/12principles/>. Explore the Key Issues and Overview for each principle. What are the main points?
3. Access <https://www.oecd.org/governance/digital-government/toolkit/self-assessment/>. Explore the self-assessments. What are the key lessons learned?

# **Part II - Technology, Smart City and Digital Government Models**

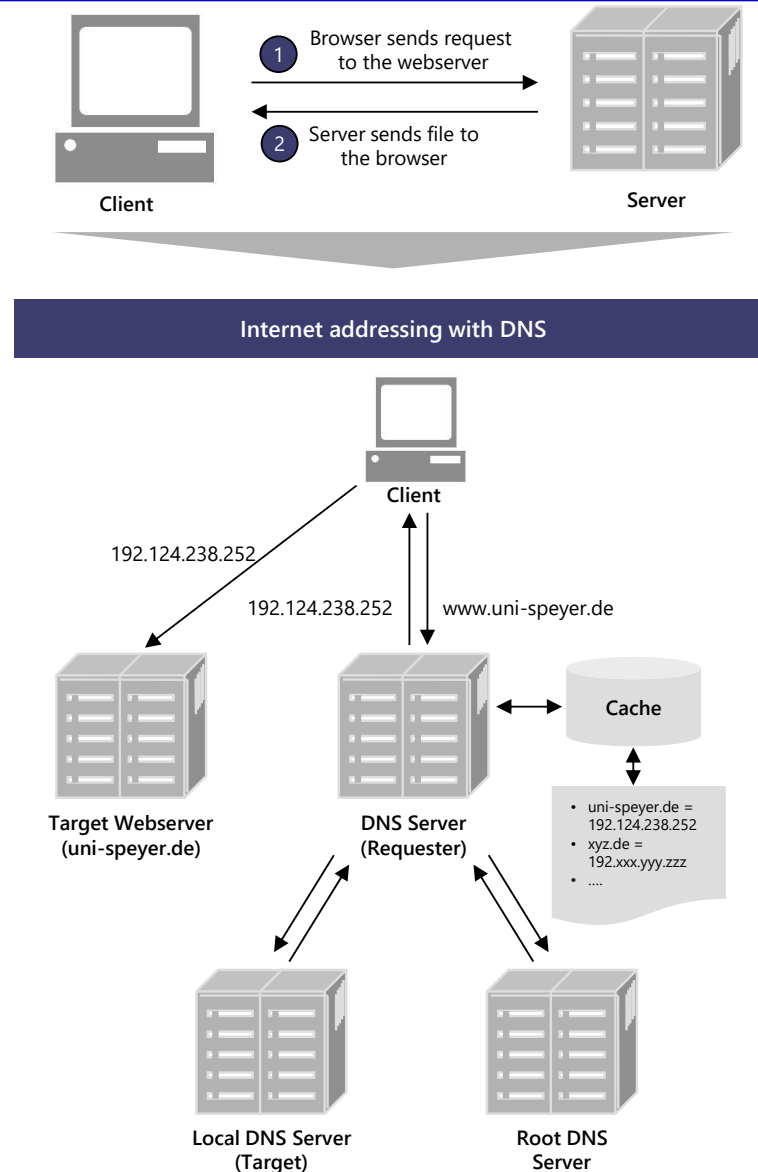
# **Chapter 5: Digital Government Technology**

# Fig. 5.1 Five Phases Model of Digital Transformation



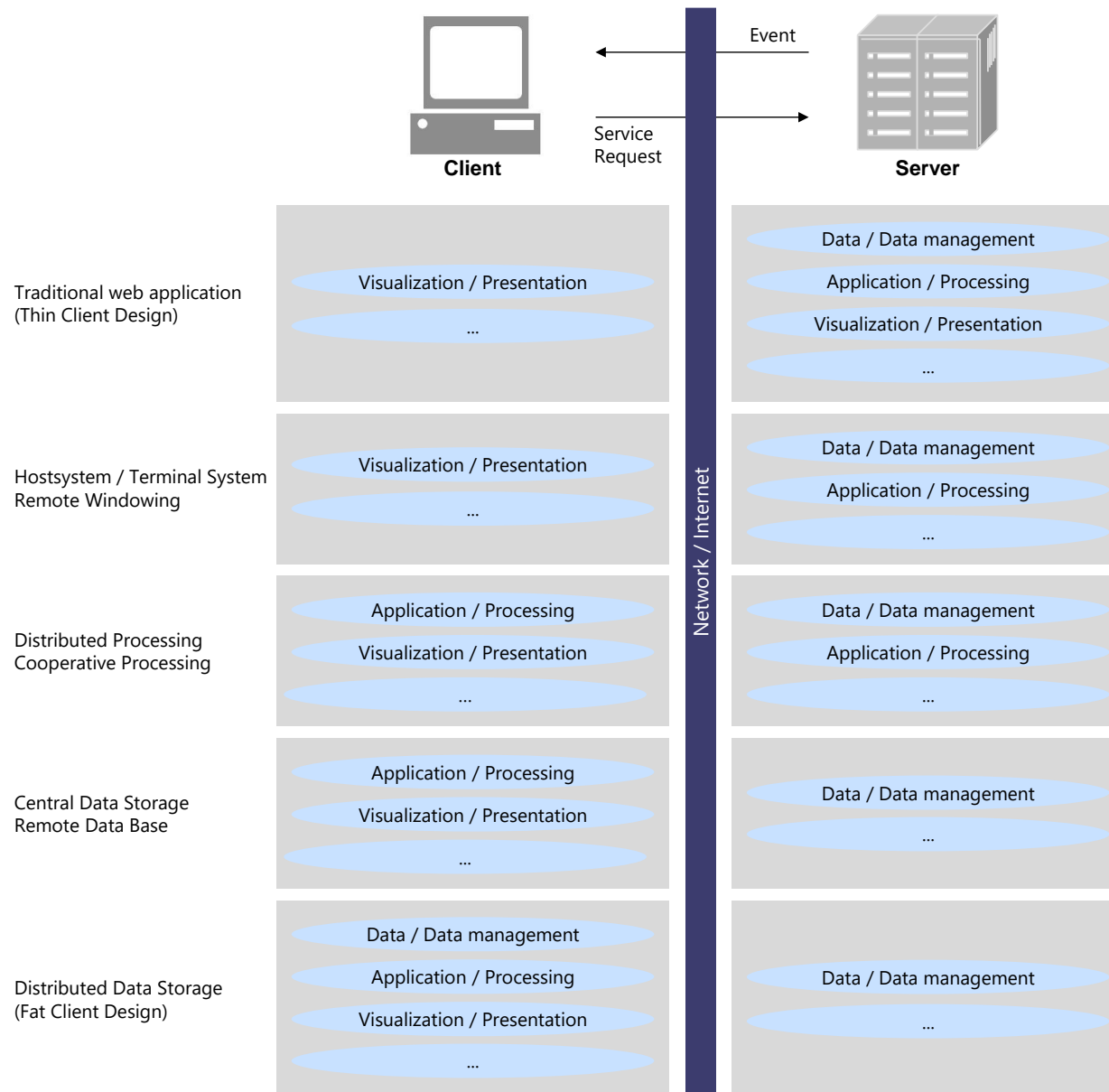
Source: Wirtz (2022)

## Fig. 5.2 Client-server principle and Internet addressing with DNS



Source: Wirtz (2013a, 2021b, 2020b, 2022)

# Fig. 5.3 Distribution of tasks between client and server



Source: Wirtz (2021b, 2022)

## Table 5.1 Classification of the most important services on the Internet (1)

Services	Protocol	Description	Application
Word Wide Web	HTTP/HTTPS	Transfer of websites	Web browser (Google Chrome, Internet Explorer, Firefox, Opera, etc.)
Email	SMTP/POP3/IMAP	Exchange of electronic messages (with data attachments)	Email program (Outlook, Thunderbird, etc.) or web-based interface
Data Transfer	FTP/FTPS	Data transfer to Internet server	FTP clients (WS-FTP, FileZilla, etc.)
Encrypted Network Connections	SSH	Encrypted access to other computers	PuTTY, WinSCP, etc.
Virtual Private Network (VPN)	IPSec/TSL/SSL/ViPNet/PPTP/PPPD	Secure partial networks with restricted access on the Internet	Different clients (OpenVPN, Cisco VPN, etc.)

Source: Wirtz (2013a, 2020b, 2021b, 2022)

## Table 5.1 Classification of the most important services on the Internet (2)

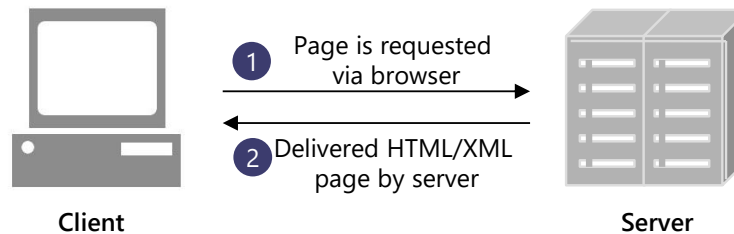
<b>Remote Control</b>	Telnet	Use of remote computers	Functionality provided by operating system
<b>Distributed Data Exchange (Peer-to-Peer Procedure)</b>	BitTorrent/Gnutella	Sharing site for decentral exchange of files	BitTorrent, Souseek, WinMX etc.
<b>Usenet</b>	NNTP	Discussion forum	News clients, mostly integrated in email programs
<b>Voice over IP (VoIP)</b>	SIP/SIPS/H.323/IAX/MGCP/Jingle	Phone via the Internet	Skype, etc.
<b>Instant Messaging</b>	OSCAR/Simple/ Tencent QQ/ XMPP	Instant transmission of text messages; type of chat	WhatsApp-Web, FacebookMessenger, Skype, etc.

Source: Wirtz (2013a, 2020b, 2021b, 2022)

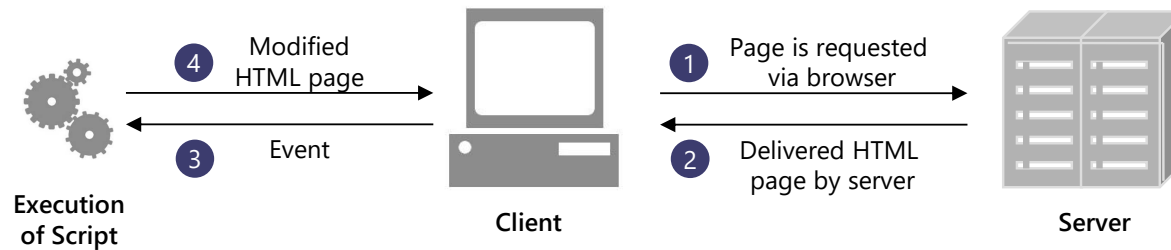


## Fig. 5.4 Static vs. dynamic WWW documents

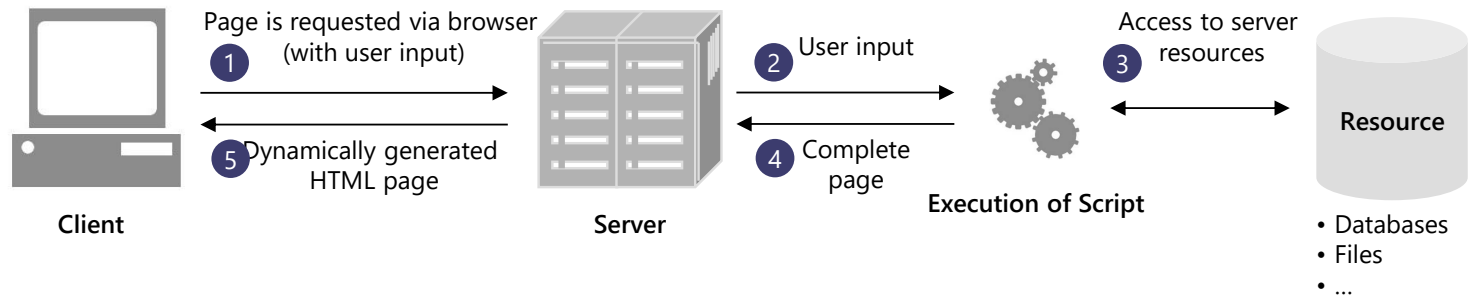
### Display of Static WWW Documents



### WWW Documents with Client-Side Script Execution

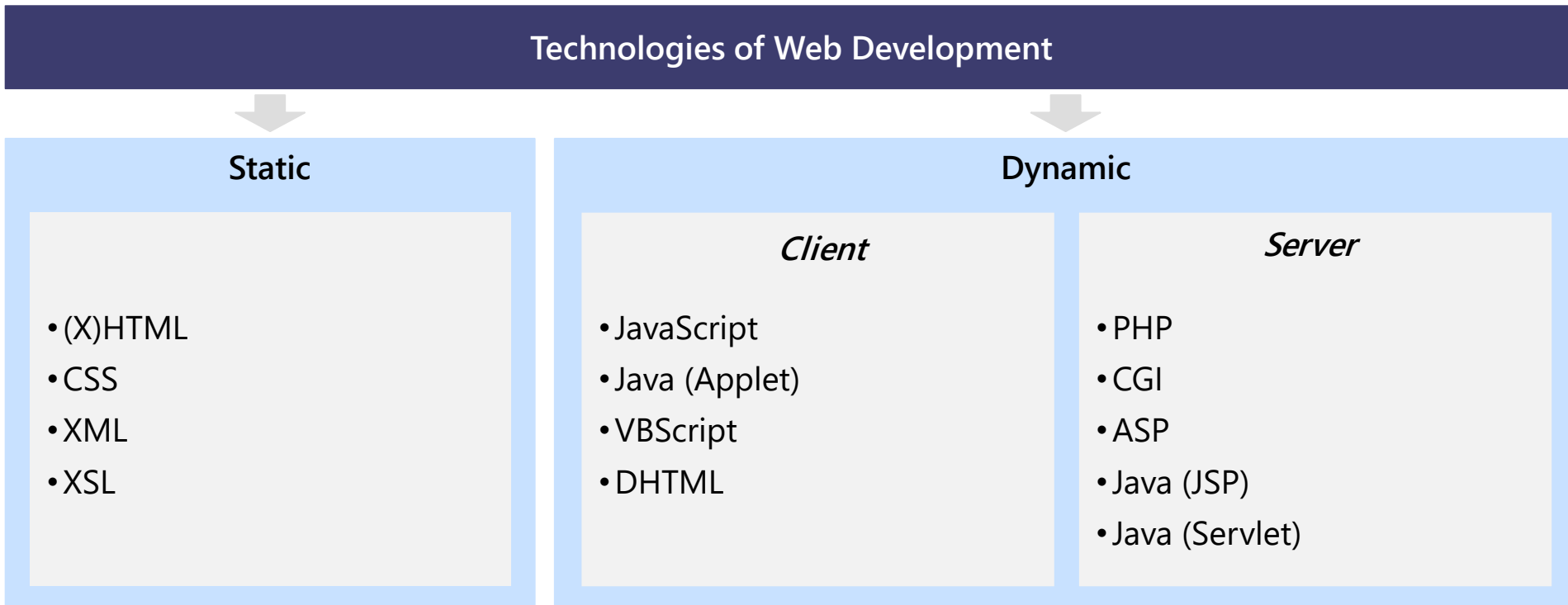


### WWW Documents with Server-Side Script Execution



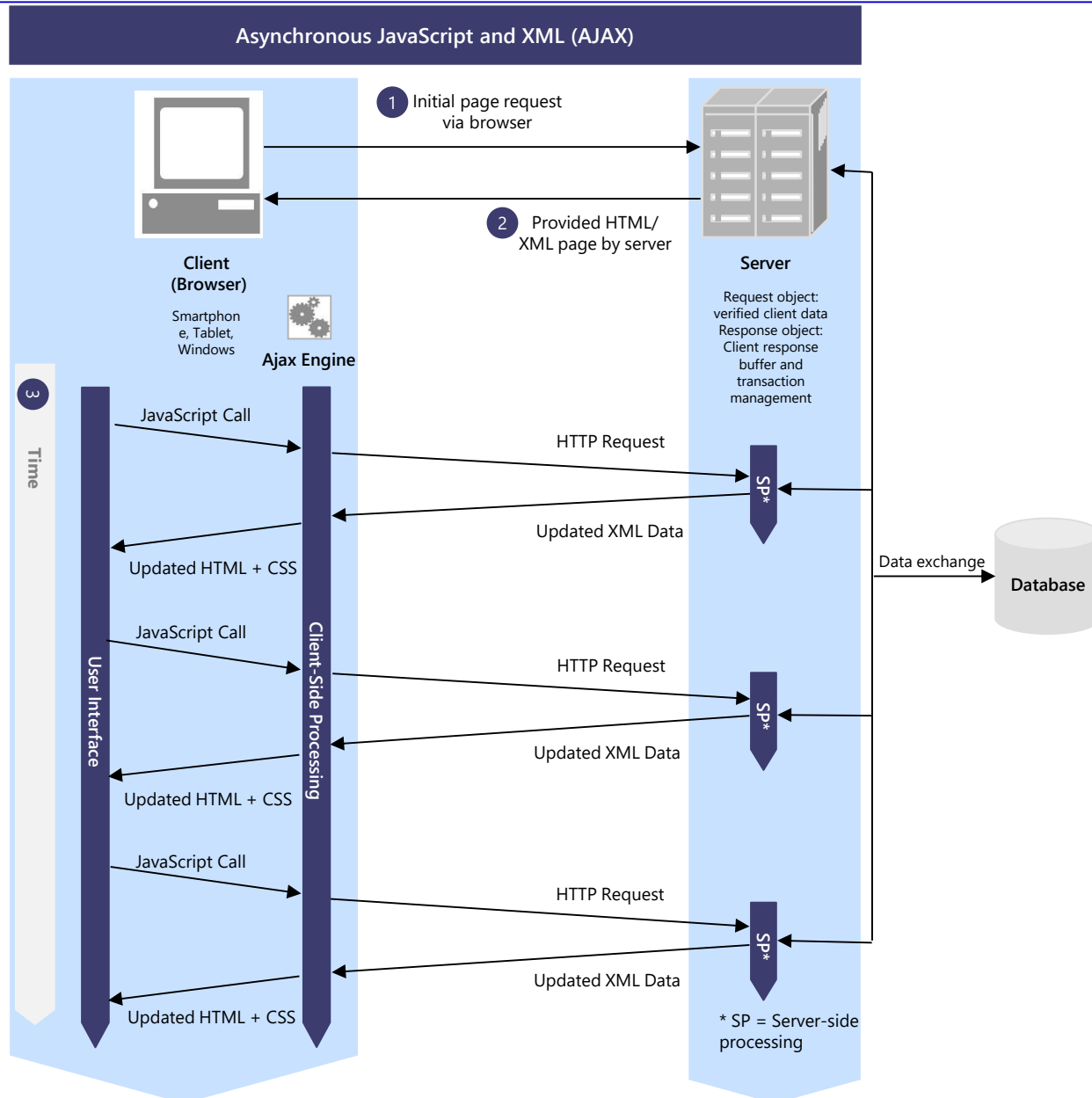
Source: Wirtz (2013a, 2021b, 2022)

## Fig. 5.5 Static and dynamic languages of web development

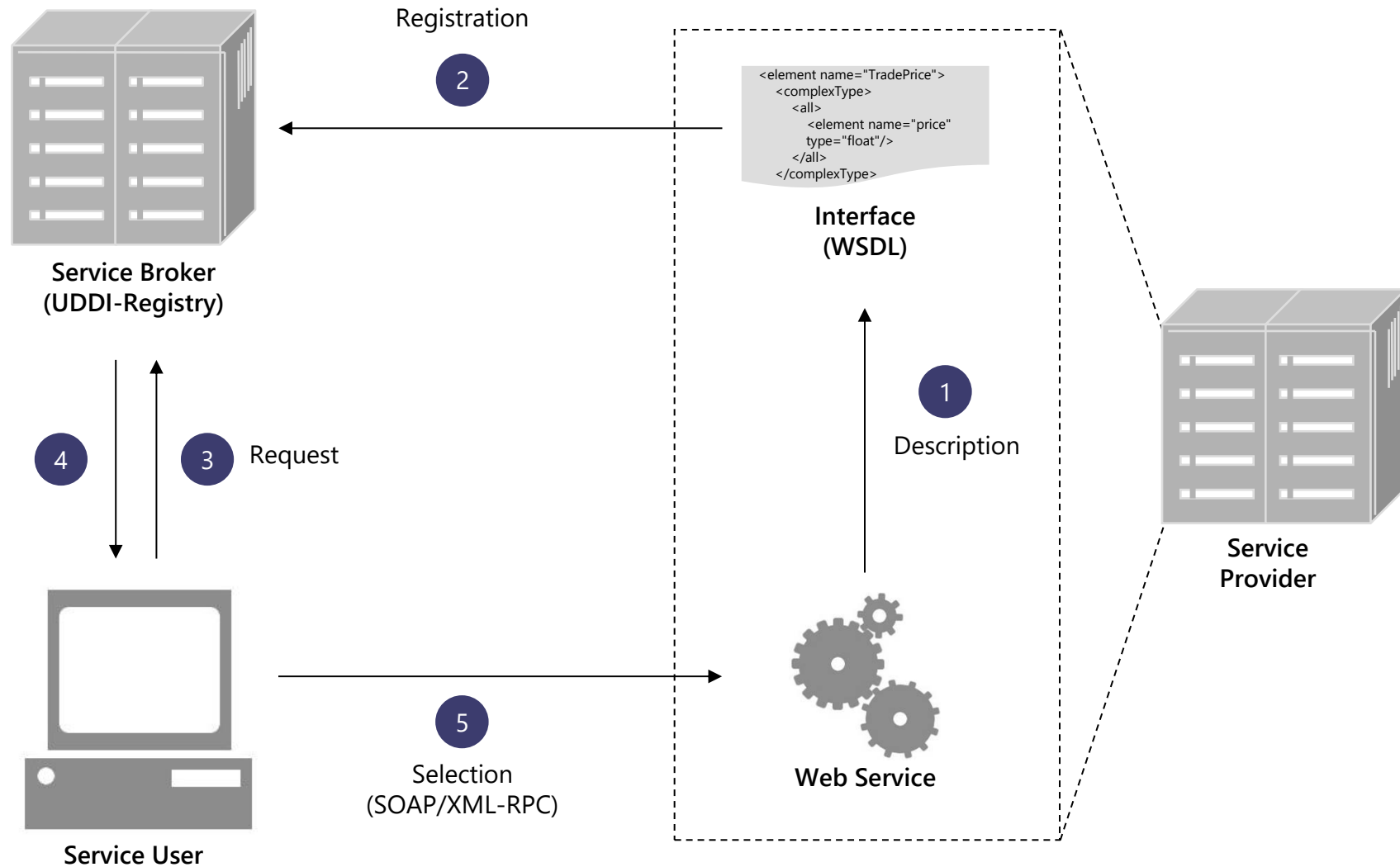


Source: Wirtz (2013a, 2021b, 2022)

# Fig. 5.6 Operating principle and schedule of an AJAX application

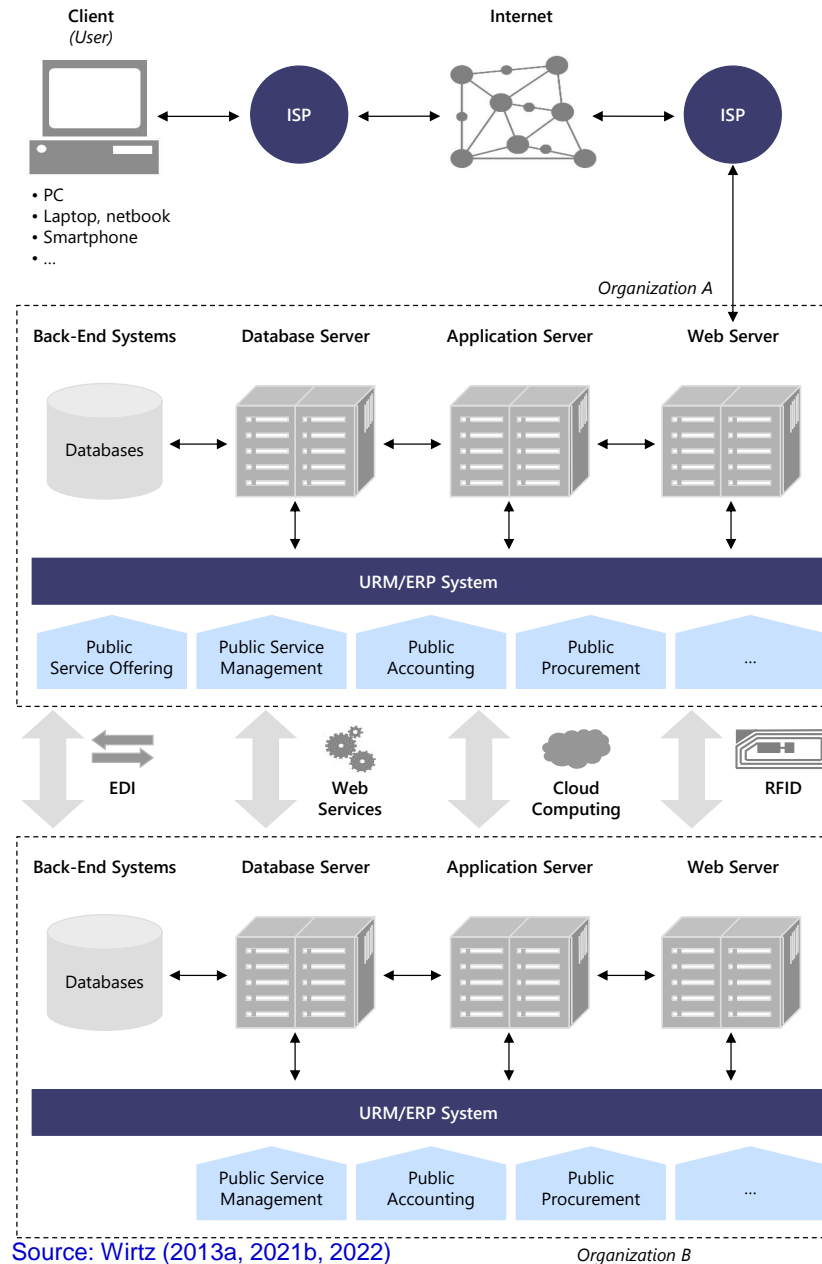


## Fig. 5.7 Operating principle of a web service



Source: Wirtz (2021b, 2022)

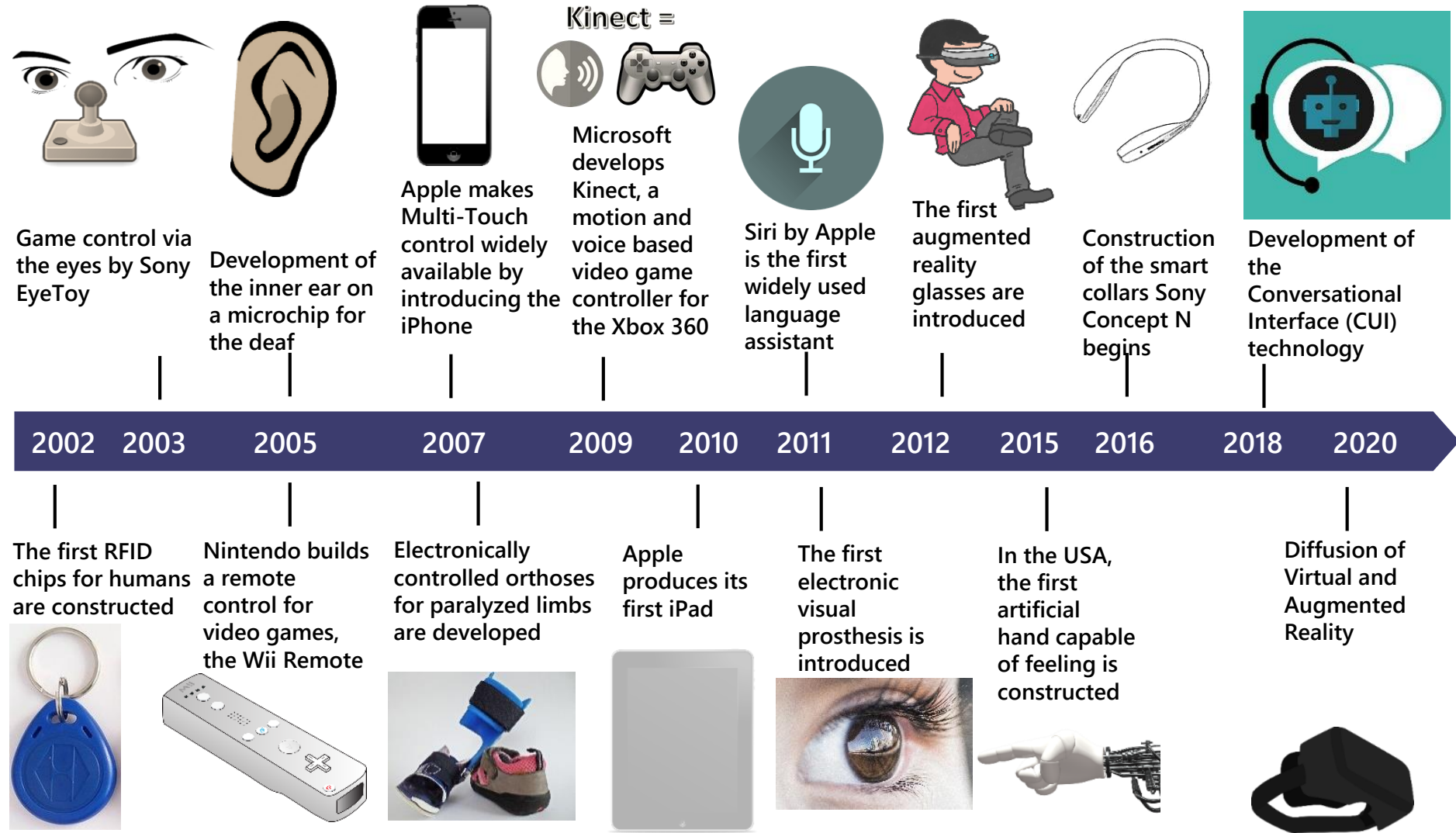
# Fig. 5.8 Example of a digital government architecture



Source: Wirtz (2013a, 2021b, 2022)

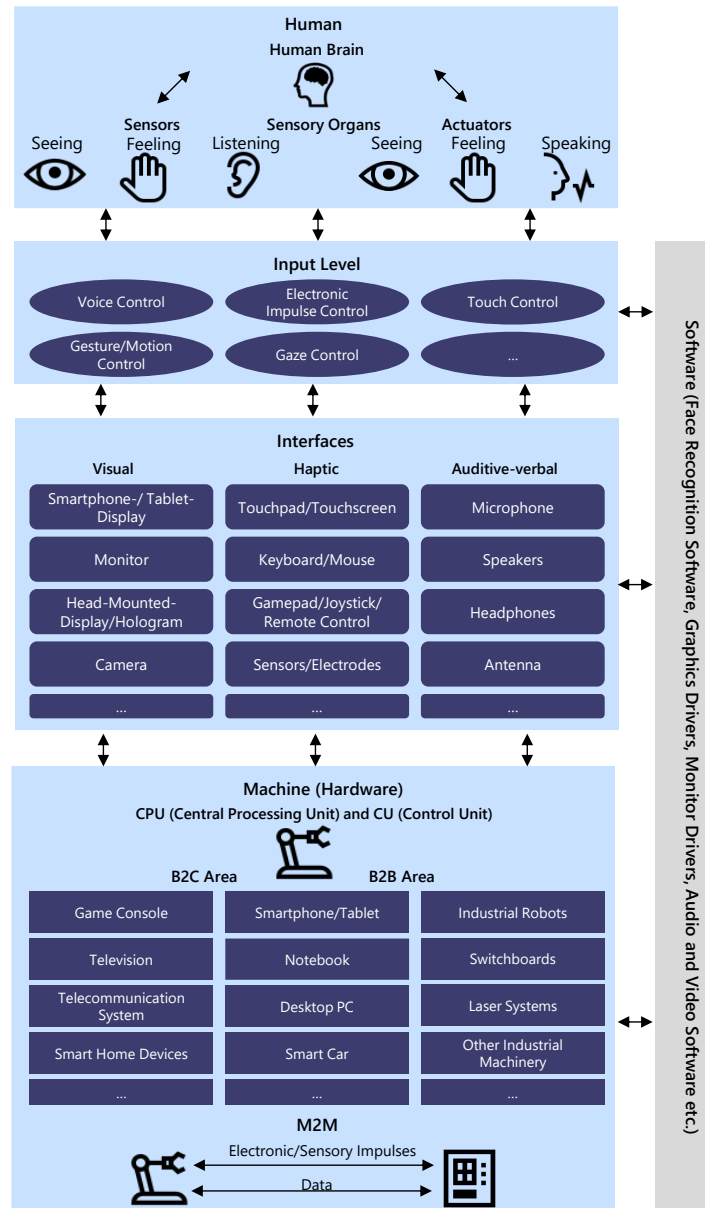
Organization B

# Fig. 5.9 Development of the human-machine interface (since 2000)



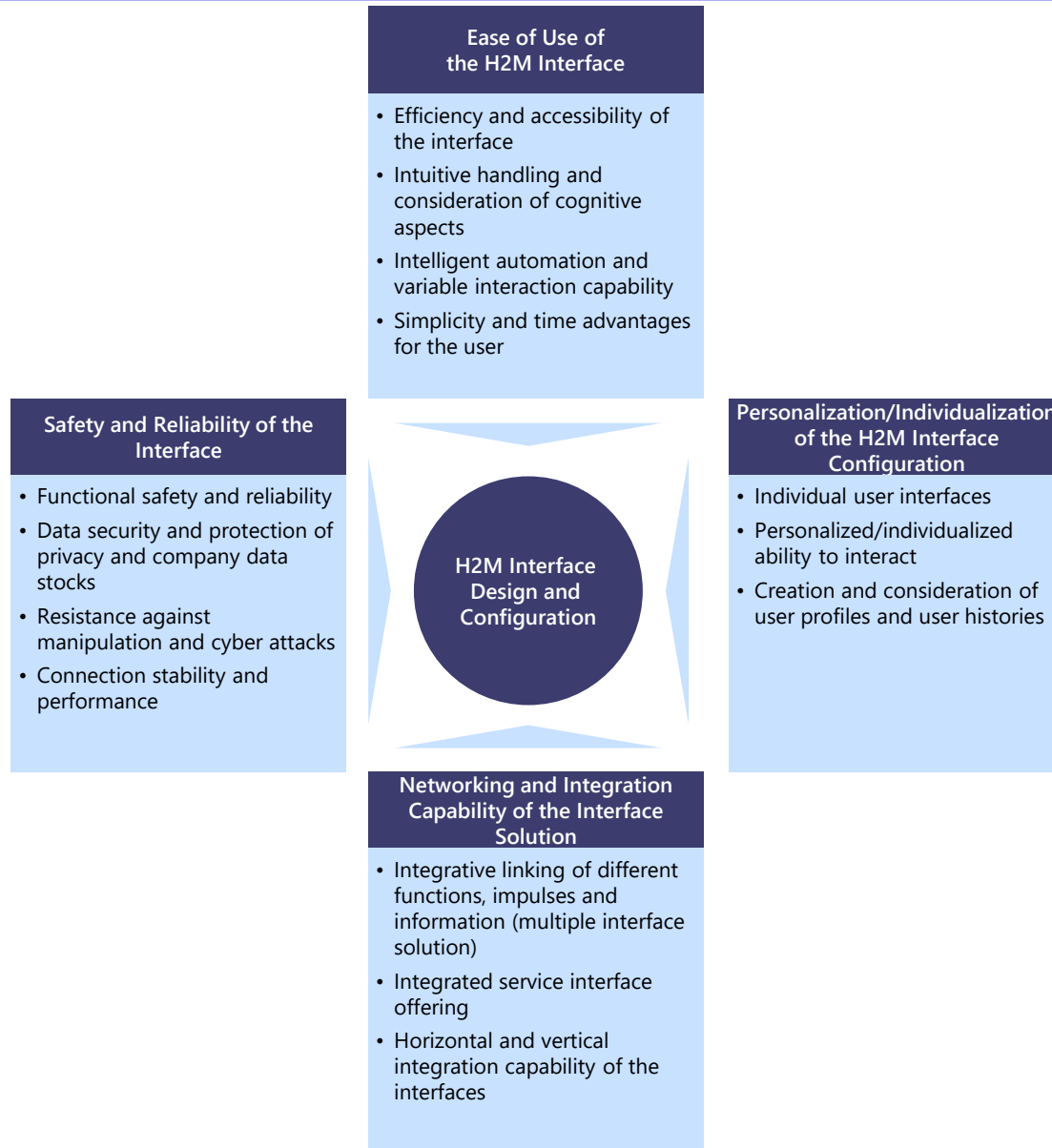
Source: Wirtz (2020b, 2021b, 2022)

# Fig. 5.10 HMI model of human-machine interaction



Source: Wirtz (2020b, 2021b, 2022)

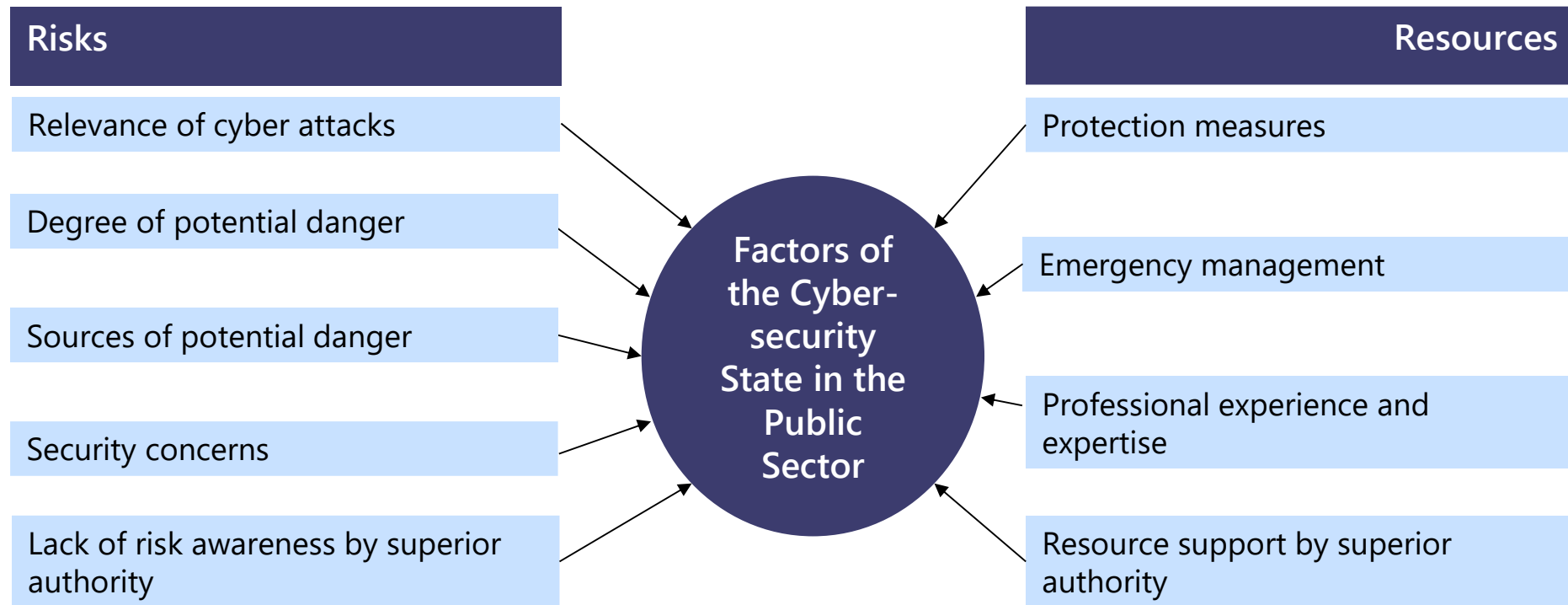
## Fig. 5.11 Success factors of H2M interface design and configuration



Source: Wirtz (2020b, 2021b, 2022)

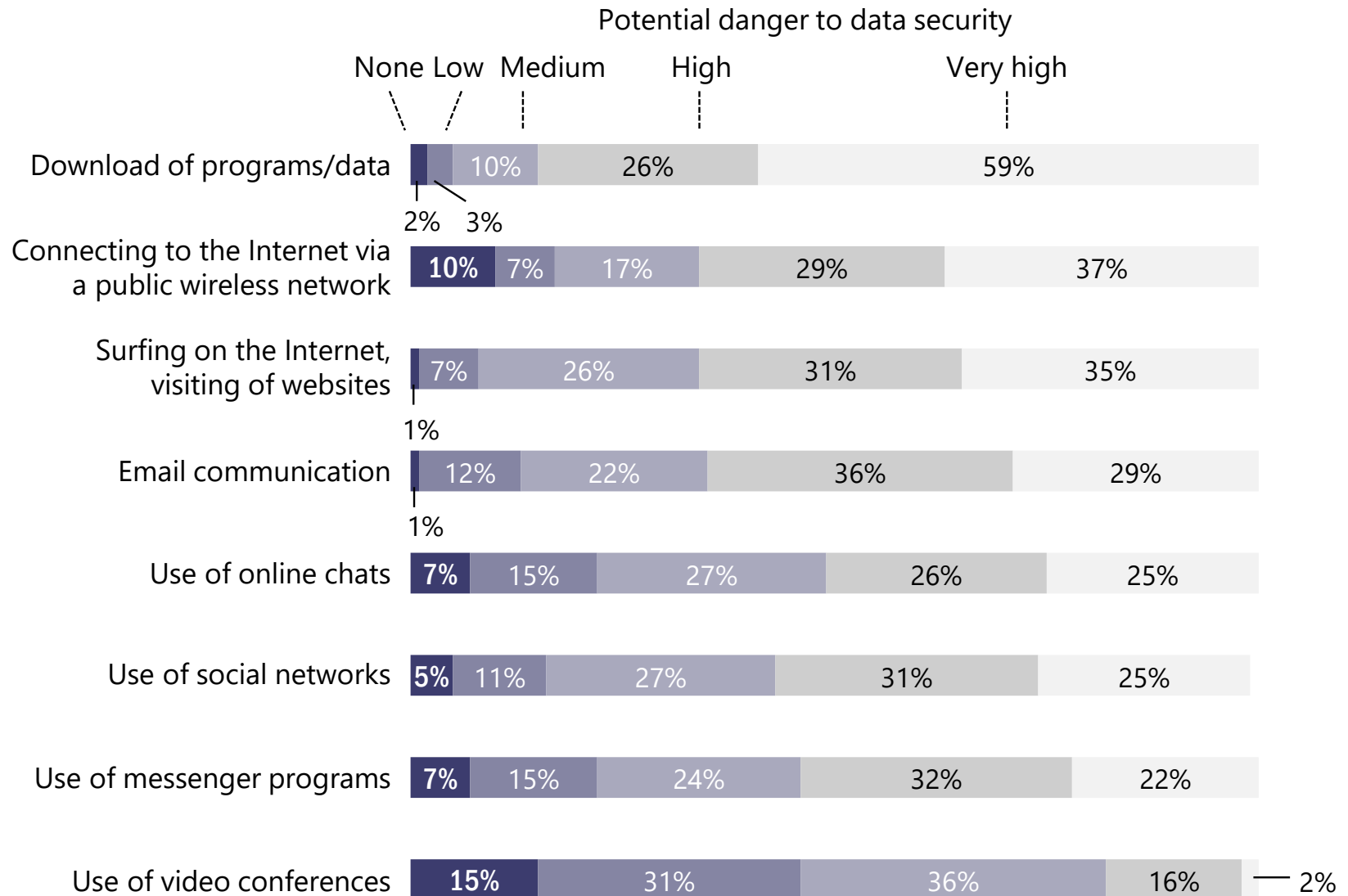


**Fig. 5.12 Public risk-resource cybersecurity framework**



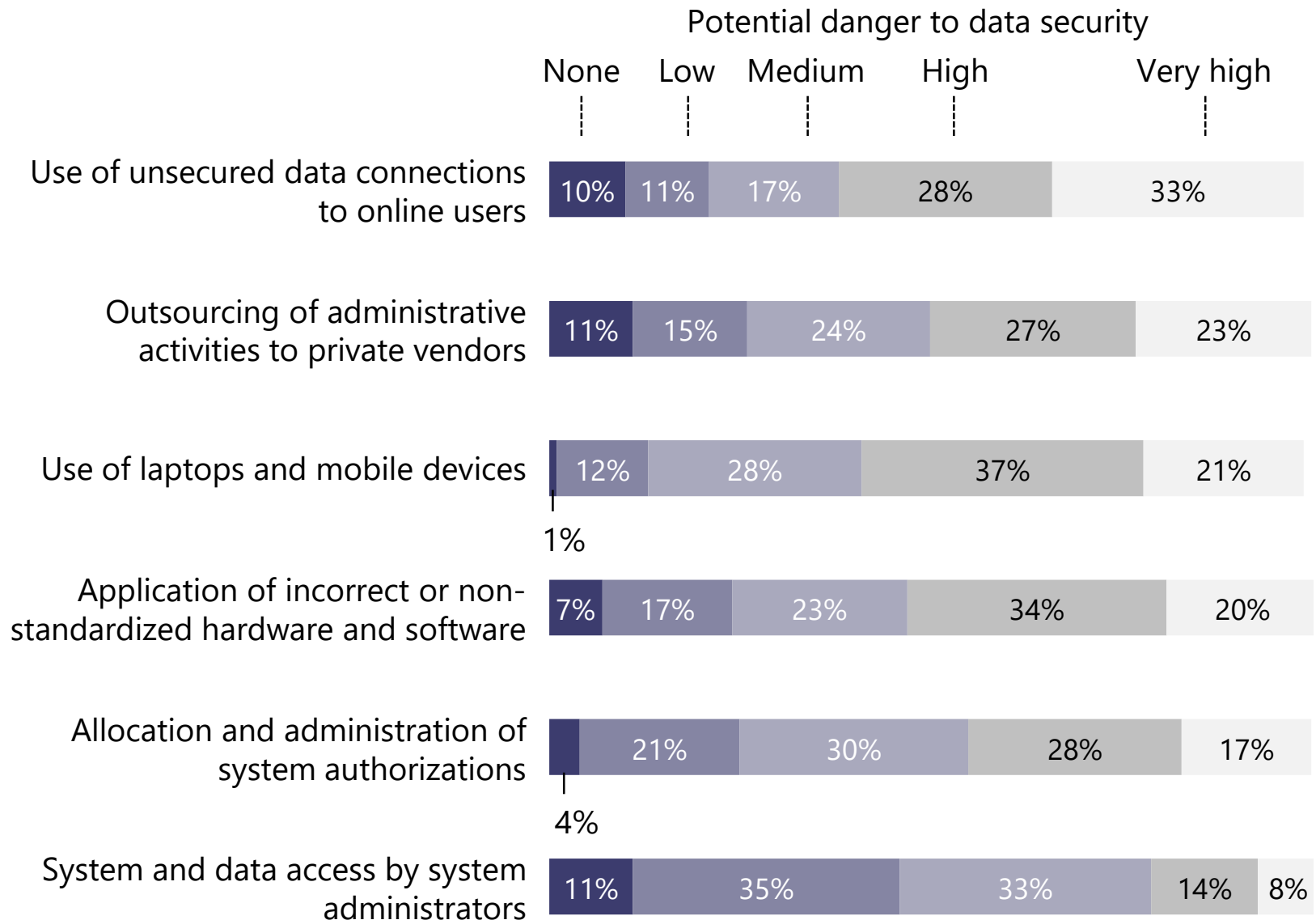
Source: Wirtz (2020b, 2021b, 2022)

## Fig. 5.13 Online activities as potential sources of danger to data security



Data Source: Wirtz and Weyerer (2017b), Wirtz (2022)

**Fig. 5.14 Other activities as potential sources of danger to data security**



Data Source: Wirtz and Weyerer (2017b), Wirtz (2022)

## Table 5.2 Threats in computer networks (1)

Type of attack	Threat	Description
<b>Malware</b>	Virus	A virus is an integrated code in a (host) program that can reproduce itself and can manipulate system environments or data unnoticed.
	Worm	A worm is an independent program that can spread and reproduce itself. In contrast to a virus it does not require a host program.
	Spyware/Adware	Spyware/adware is a spy program that sends user data to the programmer/producer without the users' notice and consent or unwantedly offers them products.
	Scareware	Scareware leads the user to believe that his or her computer is broken or was compromised. Subsequently, it offers the user to eliminate the danger by asking for a payment.
	Dialer	A dialer establishes a dial-up connection to the Internet (via modem/ISDN) and is a form of malware if it establishes a connection to a very expensive fee-based number.
	Trojan	Trojans or Trojan horses are computer programs that give the impression of being useful applications but actually fulfill another or malicious function.

Source: Wirtz (2013a, 2021b, 2020b, 2022)

## Table 5.2 Threats in computer networks (2)

<b>Attacks on IT-Infrastructures</b>	DoS-Attack/ DDoS-Attack	A denial of service attack intentionally causes an overload of a system or a network in order to temporarily limit the availability of one or multiple services. If the attack comes from different systems, it is called a distributed DoS-attack.
	Scanner	A scanner systematically screens systems for security vulnerabilities (such as unsecured network ports) in order to attack them through the detected loophole.

Source: Wirtz (2013a, 2021b, 2020b, 2022)

## Table 5.2 Threats in computer networks (3)

<b>Interception, Reading and Manipulation of Data</b>	Sniffer	<p>A sniffer not only allows to intercept and record data packets in networks but also to analyze them subsequently.</p> <p>Sniffers are applied in the context of network analyses but can also be used for abuse purposes and for unauthorized data reading.</p>
	Keylogger	<p>Keyloggers record all user inputs (keyboard) and save them or send them to third parties. In this way, for instance, hackers can gain access to passwords or pin numbers.</p>
	Password Cracker	<p>Password crackers are programs that allow to bypass access barriers. In this connection, they differ with regard to the selected method; often the so-called dictionary or brute force attack (testing all possible combinations) is applied.</p>
	Man-in-the-Middle Attack (Snarfing)	<p>In the case of the man-in-the-middle attack, an attacker logically interposes himself or herself between two communication partners. Here, the attacker can control and arbitrarily look at or manipulate the data traffic between the communication partners.</p>
	Phishing	<p>In the case of phishing, a hacker tries to imitate a trustworthy website (e.g., online banking) and to prompt a user by means of a faked message to reveal sensitive or access data.</p>

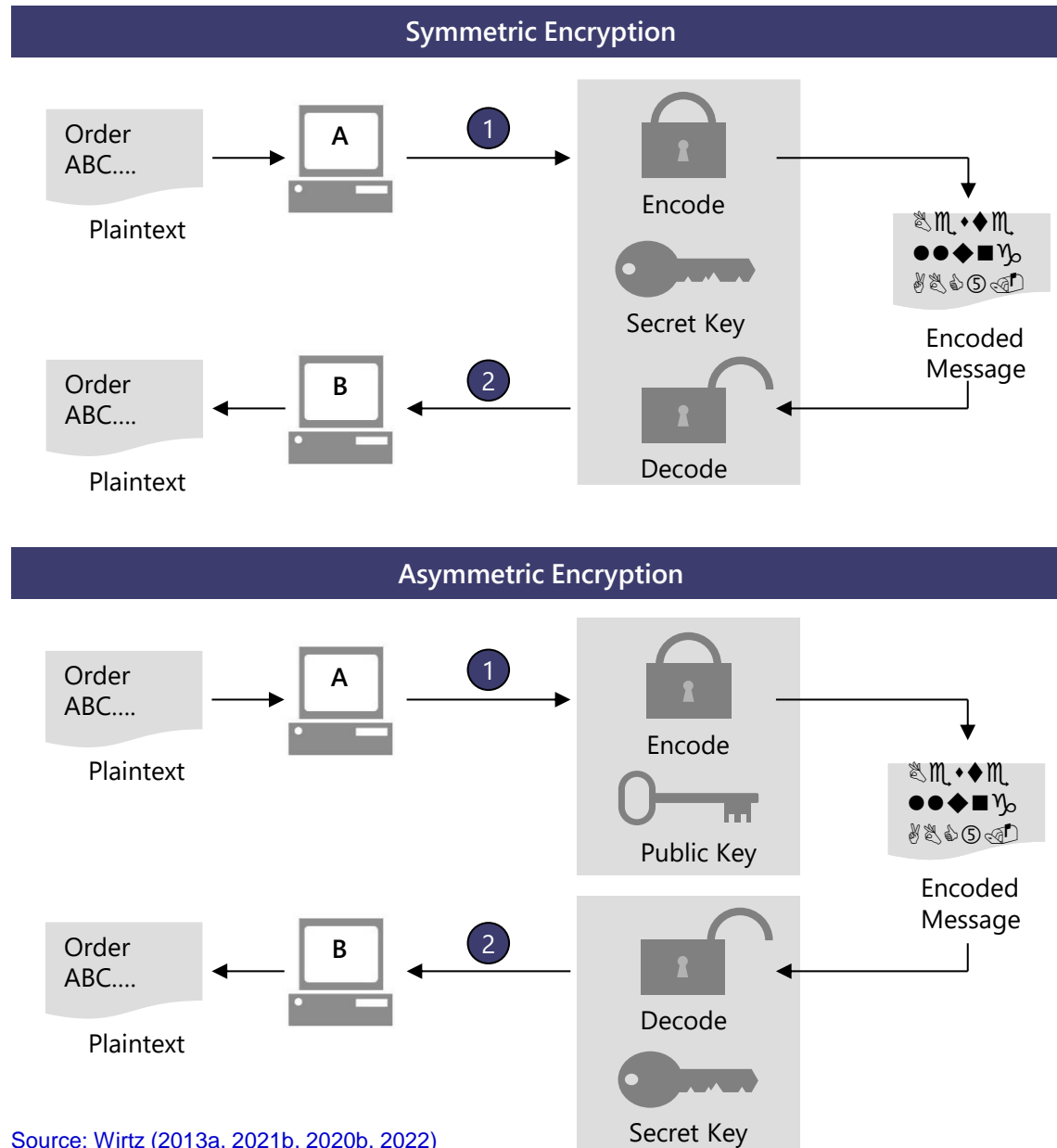
Source: Wirtz (2013a, 2021b, 2020b, 2022)

## Table 5.2 Threats in computer networks (4)

<b>Identity Theft/ Deception</b>	Spoofing	Spoofing generally refers to disguising one's own identity. There are many different types of spoofing. In the case of IP spoofing, for instance, a hacker modifies all IP packets with a faked sender IP and creates the impression that the packets are sent from another computer. Moreover, DNS, mail, mac, and DHCP spoofing, etc. are commonly used.
	Social Engineering/ Social Hacking	Social engineering refers to spying out a user's personal environment and faking an identity through this information. This personal identity is used in the context of social hacking to look at private data.

Source: Wirtz (2013a, 2021b, 2020b, 2022)

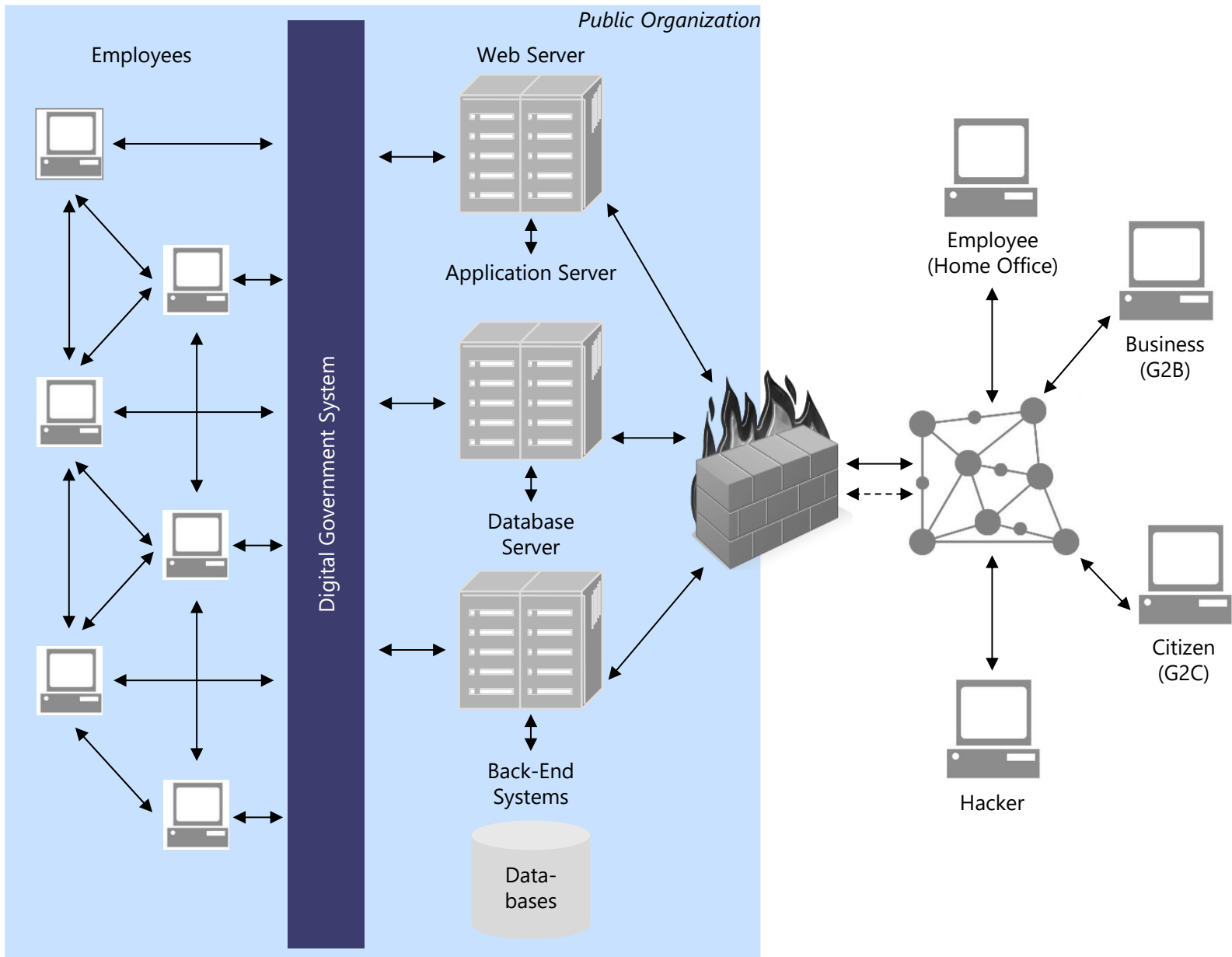
**Fig. 5.15 Functional principle of symmetric and asymmetric encryption**



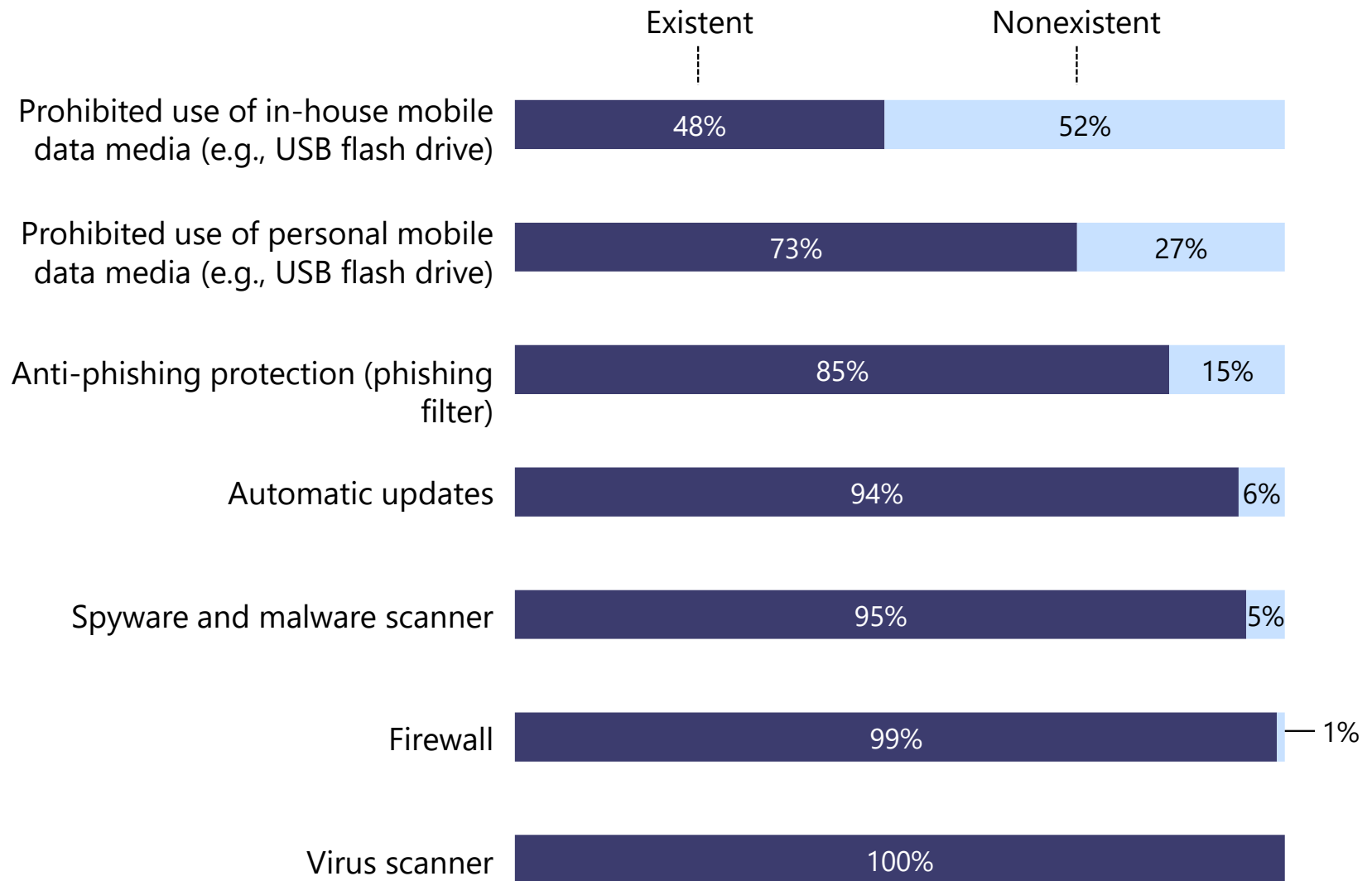
Source: Wirtz (2013a, 2021b, 2020b, 2022)



**Fig. 5.16 Functions of a firewall**

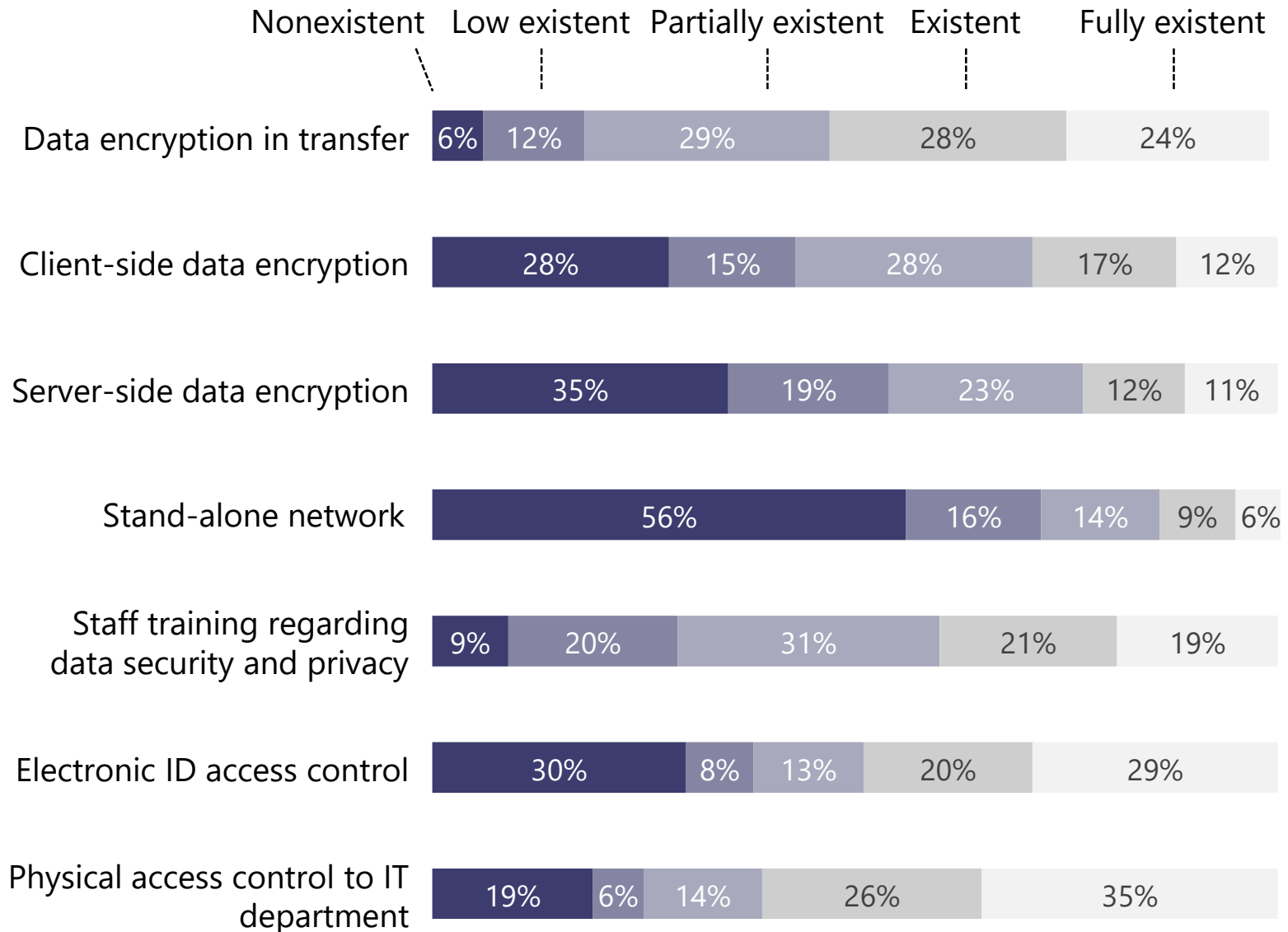


**Fig. 5.17 Dichotomous in-house protection measures against cyber-attacks**



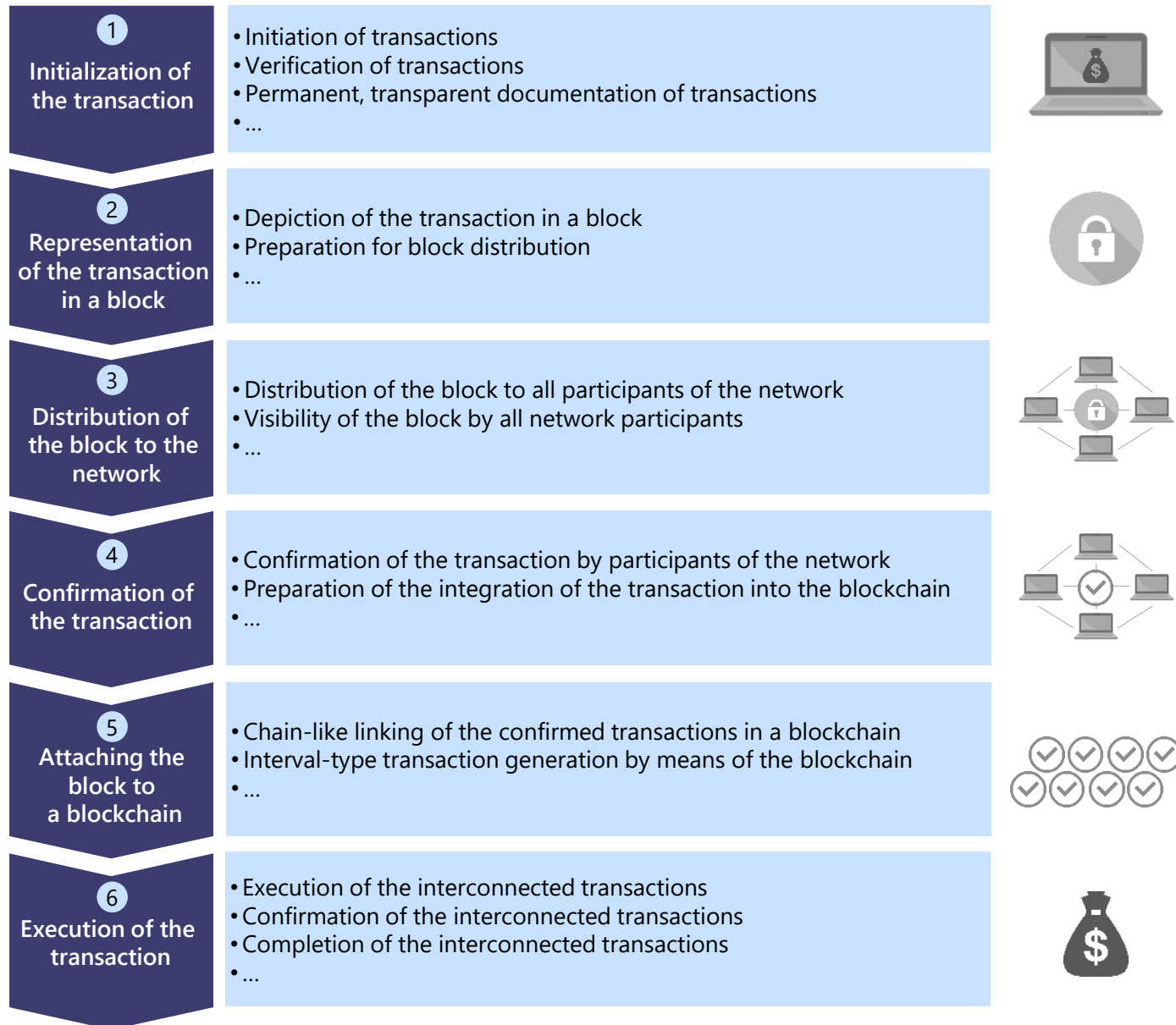
Data Source: Wirtz and Weyerer (2017b), Wirtz (2022)

## Fig. 5.18 Polytomous in-house protection measures against cyber-attacks



Data Source: Wirtz and Weyerer (2017b), Wirtz (2022)

## Fig. 5.19 Transactions in the blockchain



# Chapter 5

## Review questions, topics for discussion and online exercises

### Chapter 5

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Describe the five phases model of digital transformation.
2. Present the client-server principle as well as the Internet addressing in an illustration and explain their interrelation.
3. Describe the HMI model of human-machine interaction.
4. Illustrate the risk-resources cybersecurity framework.
5. What is blockchain? Describe transaction phases and contents of blockchains



##### Topics for classroom discussion and team debates

1. Using the phases of the five phases model of digital transformation, discuss the impact of the fifth phase on public administration and society, particularly with regard to the automation of human labor and mass unemployment.
2. Discuss the future developments of human-machine interaction and configuration against the background of the increasing automation of human work through digital programs and interfaces. What are the risks for a democratic society and a free labor market?
3. Discuss the advantages and disadvantages of comprehensive cybersecurity measures to protect state infrastructure against the background of hacker attacks. Are these protection mechanisms also necessary for the consumer and business sector? In this context, discuss also the possibility of cyber wars between different states.



##### Online Exercises

1. Visit <https://www.publicsafety.gc.ca/cnt/ntnl-scrpt/cbr-scrpt/index-en.aspx>. Using the Canadian example, explore possible cyber threats and security measures at the national level.
2. Enter <https://www.cisa.gov/about-cisa>. Explore the page and work out the vision and mission of CISA.
3. Access [https://read.oecd-ilibrary.org/governance/state-of-the-art-in-the-use-of-emerging-technologies-in-the-public-sector\\_932780bc-en#page1](https://read.oecd-ilibrary.org/governance/state-of-the-art-in-the-use-of-emerging-technologies-in-the-public-sector_932780bc-en#page1). Look at emergent technologies in the public sector using the OECD Working Paper on Public Governance No. 31 and define future core technologies.

# **Chapter 6: Artificial Intelligence, Big Data, Cloud Computing and Internet of Things**

## Table 6.1 Selected definitions of AI

Author(s)	Definition
McCarthy et al. (2006)	The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.
Rich et al. (2009)	[...] the study of how to make computers do things which, at the moment, people do better.
Adams et al. (2012)	[...] a system that could learn, replicate, and possibly exceed human-level performance in the full breadth of cognitive and intellectual abilities.
Russell and Norvig (2016)	AI may be organized into four categories: Systems that think like humans. Systems that act like humans. Systems that think rationally. Systems that act rationally.
Rosa and Feyereisl (2016)	[...] programs that are able to learn, adapt, be creative and solve problems.
Thierer et al. (2017)	The exhibition of intelligence by a machine. An AI system is capable of undertaking high-level operations; AI can perform near, at, or beyond the abilities of a human. This concept is further divided into weak and strong AI.
Wirtz et al. (2019b)	[...] AI refers to the capability of a computer system to show humanlike intelligent behavior characterized by certain core competencies, including perception, understanding, action, and learning.

Source: Wirtz (2020b, 2021b, 2022)

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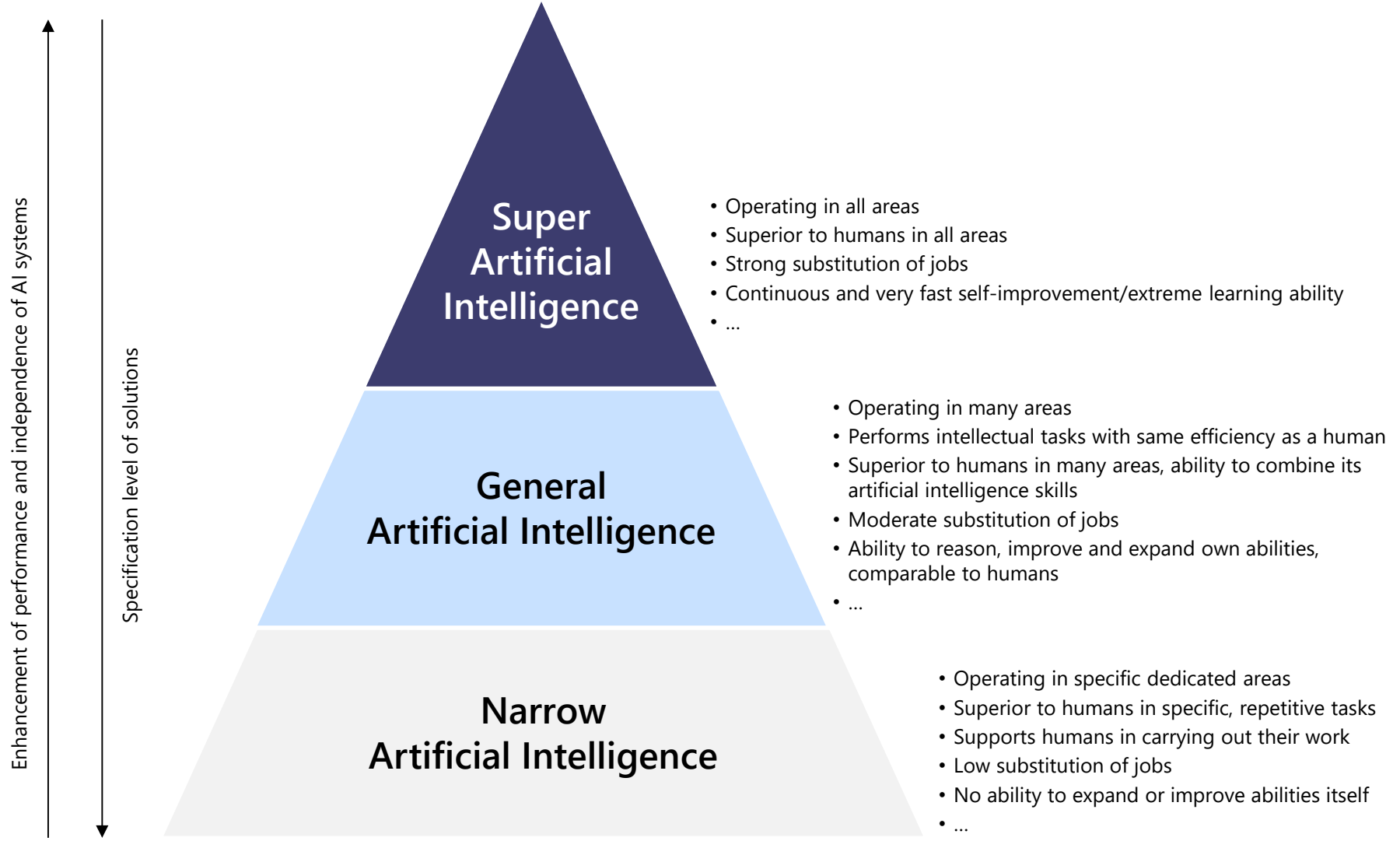
AI refers to the capability of a computer system to show human-like intelligent behavior characterized by certain core competencies, including perception, understanding, action, and learning, in order to support human and systemic behavior in the best possible way.

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Source: Wirtz et al. (2019b), Wirtz (2022)

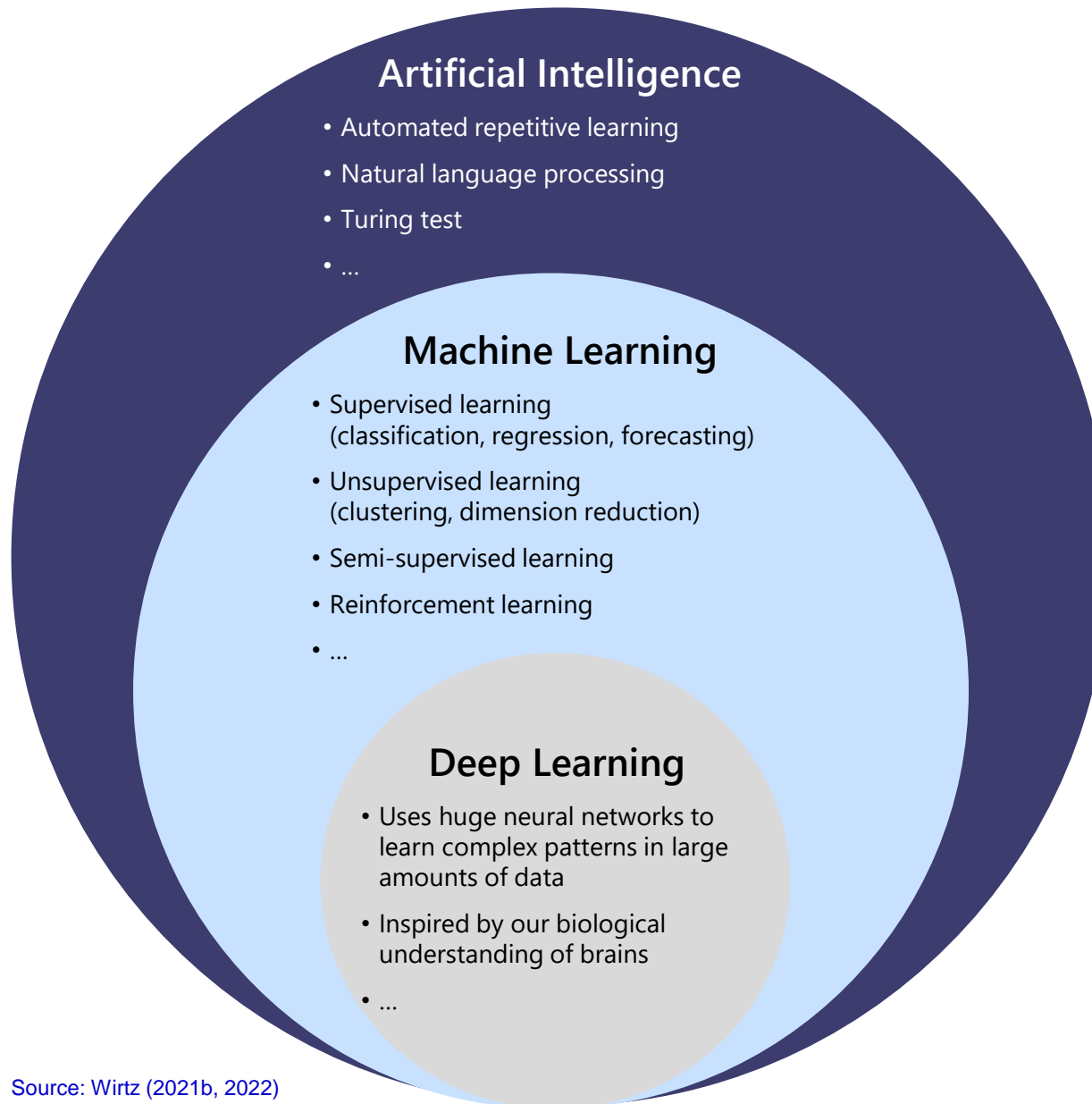


## Fig. 6.1 Development stages of artificial intelligence



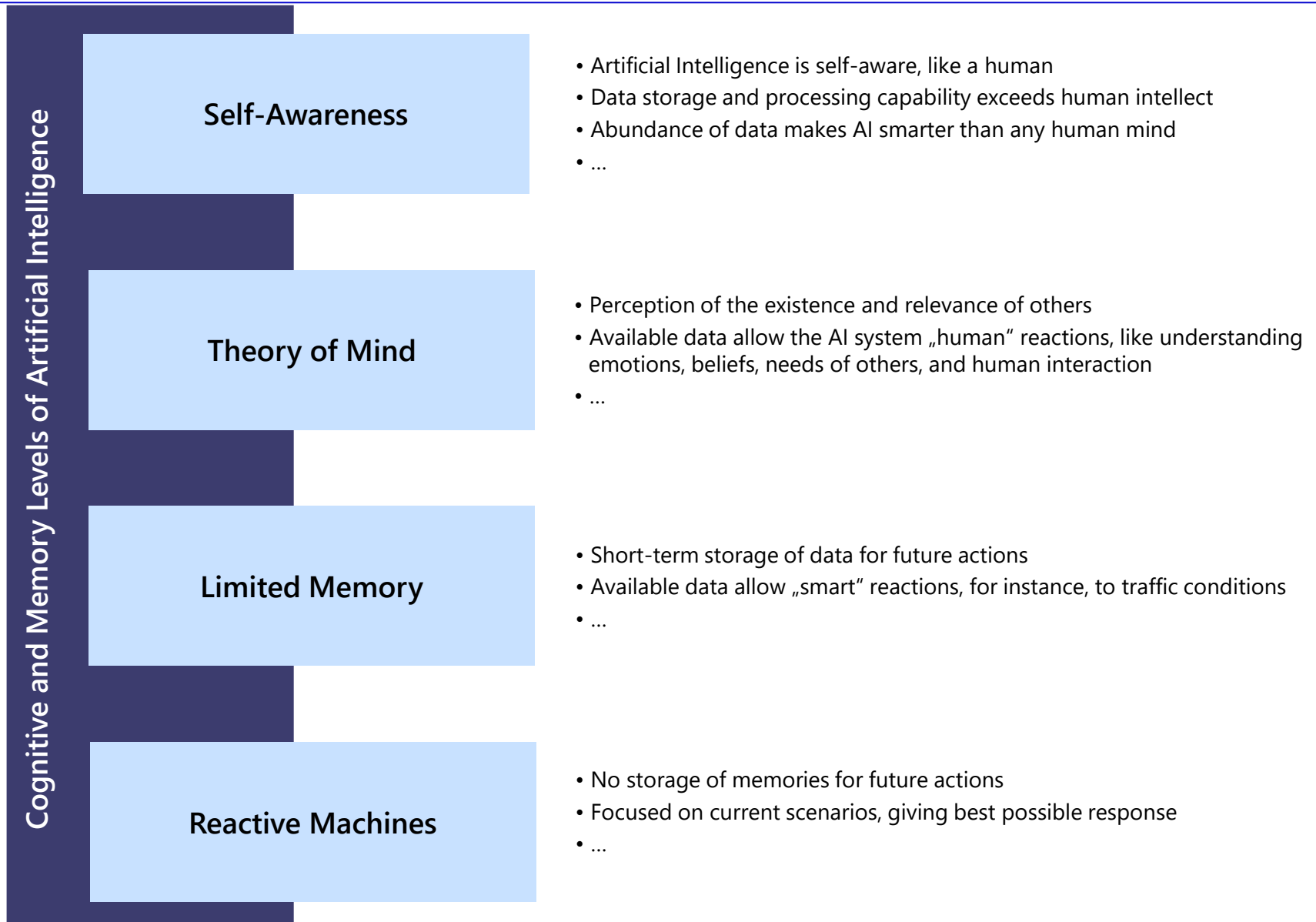
Source: Wirtz (2021b, 2022)

## Fig. 6.2 Methods of artificial intelligence



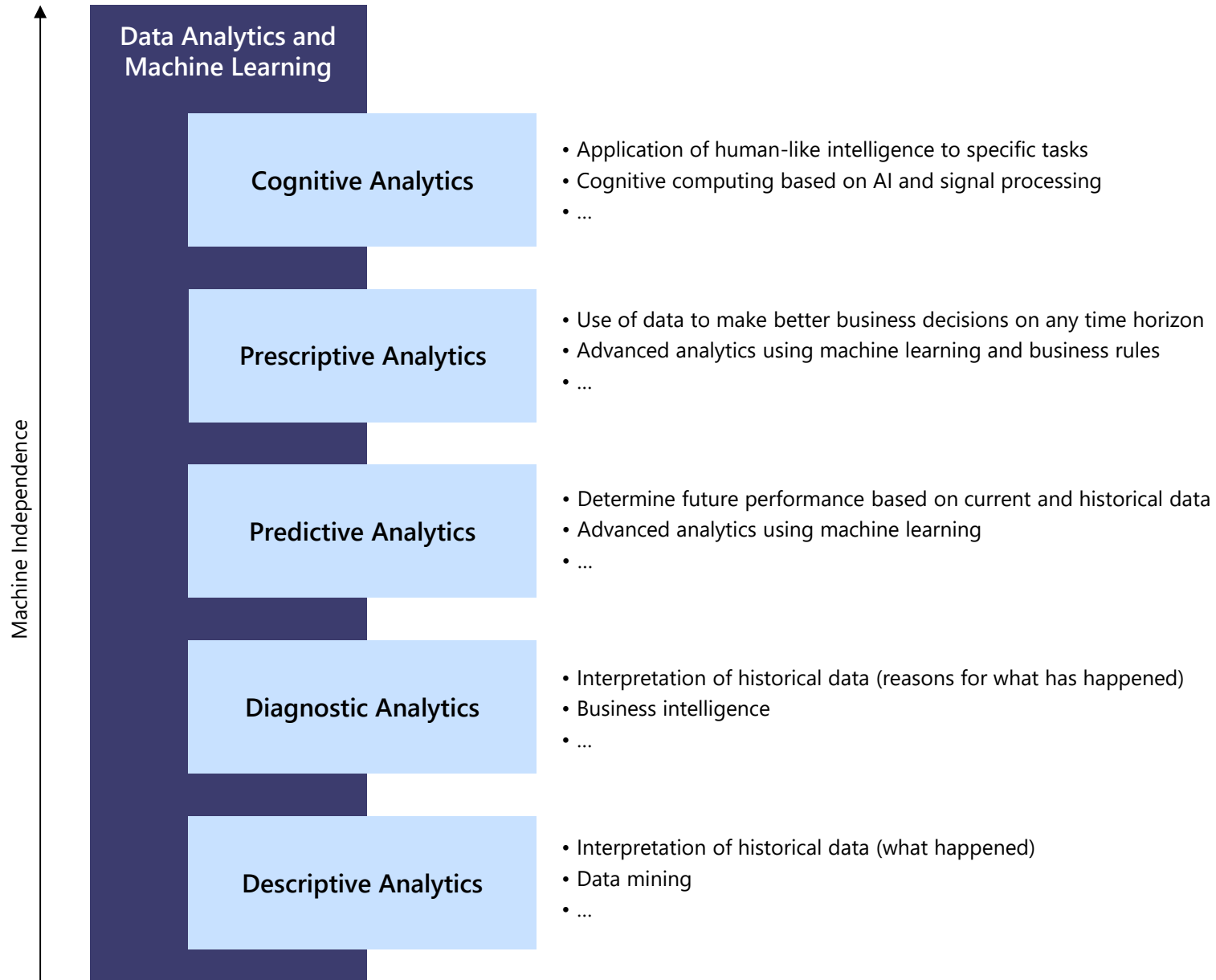
Source: Wirtz (2021b, 2022)

## Fig. 6.3 Cognitive and memory levels of artificial intelligence

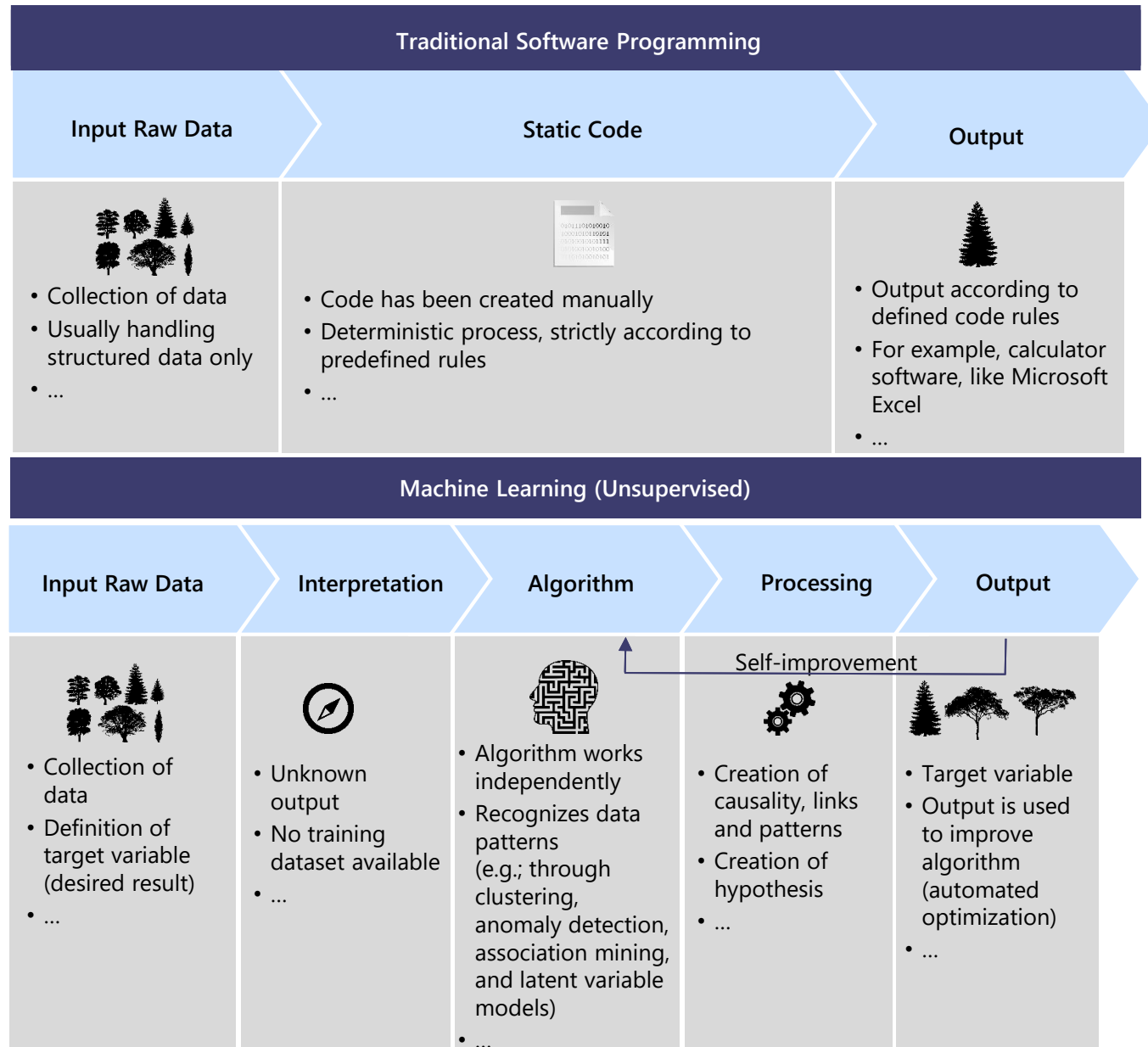


Source: Wirtz (2021b, 2022)

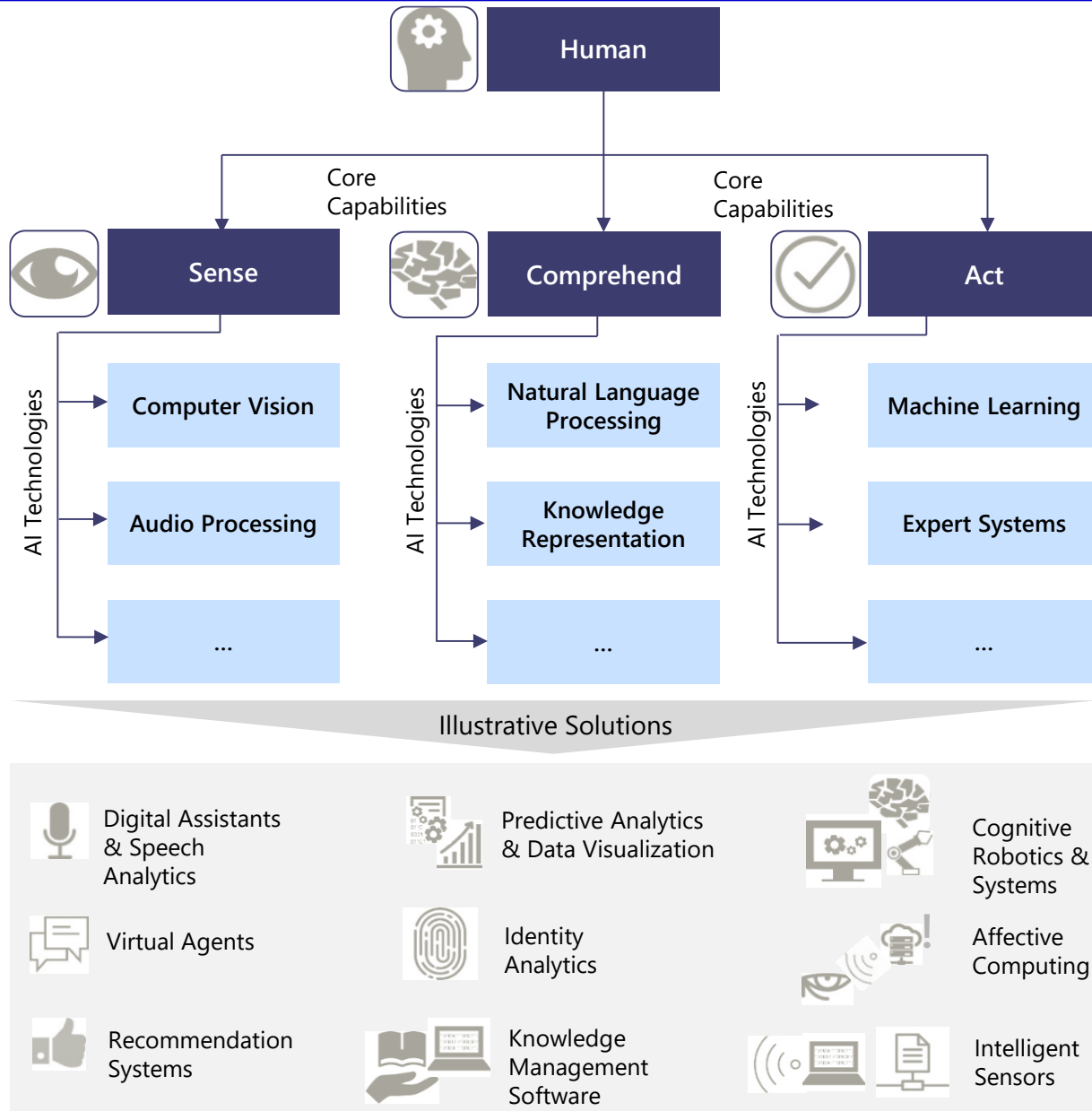
## Fig. 6.4 AI analytics approaches



# Fig. 6.5 Machine learning process vs. traditional software programming



## Fig. 6.6 AI framework



## Table 6.2 Potential AI applications and use cases (1)

AI Application	AI Value Creation and Functional Proposition	Use Cases
<b>AI-Based Knowledge Management Software</b>	<ul style="list-style-type: none"> <li>• Generation and systematization of knowledge - gather, sort, transform, record, and share knowledge</li> <li>• Natural language processing, machine learning, and expert systems can support the codification of knowledge</li> <li>• Use of neural networks enables to analyze, distribute, and share knowledge with others</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Decision support for management in the context of big data analyses</li> <li>• Clinical documentation powered by AI</li> <li>• Knowledge transfer during induction of employees</li> <li>• Preservation and management of knowledge during generational change of employees</li> <li>• ...</li> </ul>

Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (2)

<b>AI-Based Process Automation Systems</b>	<ul style="list-style-type: none"> <li>Automation of standard tasks; perform formal logical tasks with unpredictable conditions in consistent quality</li> <li>Complex human action processes (formal logical or dangerous tasks) can be transferred to automation systems, which can support humans in performing tasks</li> <li>May include rule-based assessment, workflow processing, schema-based suggestions, data mining, case-based reasoning, intelligent sensor technology</li> <li>Robotic process automation has emerged as a subarea through further technology innovations. This leverages the ability of software robots or AI-driven workers to mimic human interaction with user interfaces of software systems</li> </ul>	<ul style="list-style-type: none"> <li>Automated image diagnostics in medicine</li> <li>Automation and optimization of product development and production</li> <li>Optimization of environmental plants</li> <li>Faster and higher quality request processing for immigration application forms</li> <li>Human-computer interaction for repetitive tasks like data entry etc.</li> <li>...</li> </ul>
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Source: Wirtz (2020b, 2021b, 2022)



## Table 6.2 Potential AI applications and use cases (3)

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### Virtual Agents

- Computer-based system that interacts with the user by means of speech analytics, computer vision, and written data input
  - May also include real-time universal translation and natural language processing systems and affective computing
  - Software that can perform tasks for humans
  - Subareas are chatbots and avatars
- Recruiting chatbot
  - Virtual nursing assistant
  - Automated user correspondence
  - A chatbot helping refugees that seek asylum to fill out and search documents
  - Purchasing and consulting assistants
  - ...

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Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (4)

<b>Predictive Analytics &amp; Data Visualization</b>	<ul style="list-style-type: none"><li>• Analytics are based on the quantitative and statistical analysis and meaningful visualization of large amounts of data for forecasting purposes</li><li>• Processing of big data for reporting, prescriptive analysis, and predictive analysis</li><li>• Machine learning as a technical subarea based on algorithms that can learn from data</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Medical diagnostics</li><li>• Control and performance monitoring in public areas for police departments to determine terror threats and crime hotspots for preventive action</li><li>• Determine high crime-risk situations to secure public transport</li><li>• Forecast model to predict water levels</li><li>• Predictive maintenance in production</li><li>• Financial forecasting, price optimization, and sales forecasting</li><li>• ...</li></ul>
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Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (5)

<b>Identity Analytics</b>	<ul style="list-style-type: none"><li>• Software combined with big data, advanced analytics, and identity access management to control access to IT systems and automate risk-based identity checks</li><li>• May include deep learning and machine learning, affective computing, and artificial immune systems</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Face recognition for identification of persons</li><li>• Security robot for monitoring airports</li><li>• AI fraud detection to secure governmental data</li><li>• Customer recognition in shops</li><li>• ...</li></ul>
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Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (6)

<b>Cognitive Robotics &amp; Autonomous Systems</b>	<ul style="list-style-type: none"><li>• Systems with higher-level cognitive functions that involve knowledge representation and are able to learn and respond</li><li>• Sometimes in connection with affective computing to determine and adapt human behavior as well as respond to respective emotions</li></ul>	<ul style="list-style-type: none"><li>• Automated driving</li><li>• Electric-powered autonomous vehicles for public transport</li><li>• Robot-assisted surgery</li><li>• Care robots</li><li>• ...</li></ul>
	<ul style="list-style-type: none"><li>• ...</li></ul>	

Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (7)

<b>Recommendation Systems</b>	•	An information filtering system	•	Personalized marketing
	•	Software-based systems that screen personalized information to predict preferences of individuals	•	Product and service recommendations
	•	...	•	E-service for government offices to provide personalized information for employees
			•	...

Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (8)

<b>Intelligent Digital Assistants</b>	<ul style="list-style-type: none"><li>• Software based on speech analytics</li><li>• Digital voice control enables functionality of a personal digital assistant</li><li>• Providing an intuitive interface between a user and a system/device to search for information or complete simple tasks</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Smart procurement assistants</li><li>• Driving assistance</li><li>• Assistants for visually impaired people</li><li>• Connection of federal programs to intelligent digital assistants to make public service information available for users</li><li>• ...</li></ul>
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Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (9)

<b>Speech Analytics</b>	<ul style="list-style-type: none"><li>• Software for intelligent recognition and processing of language</li><li>• Understand or respond to natural language</li><li>• Translate from spoken to written language or from one to another natural language</li><li>• May include real-time universal translation and natural language processing systems</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Universal real-time translation of language and text in public service settings</li><li>• Administrative workflow support by translating speech into text</li><li>• Bot for the care of refugees</li><li>• ...</li></ul>
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Source: Wirtz (2020b, 2021b, 2022)

## Table 6.2 Potential AI applications and use cases (10)

<b>Cognitive Security Analytics &amp; Threat Intelligence</b>	<ul style="list-style-type: none"><li>• Additional application for cognitive technologies to analyze security information through natural language processing and machine learning</li></ul>	<ul style="list-style-type: none"><li>• Behavior pattern recognition for higher IT security</li></ul>
	<ul style="list-style-type: none"><li>• Interpret and organize information and provide reasoning</li></ul>	<ul style="list-style-type: none"><li>• Monitoring of financial transactions</li></ul>
	<ul style="list-style-type: none"><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Sample diagnoses for better fraud detection</li><li>• Applications like Watson for cybersecurity to support human security analysis in the public sector</li></ul>
		<ul style="list-style-type: none"><li>• ...</li></ul>

Source: Wirtz (2020b, 2021b, 2022)



## Table 6.3 Industry-specific potential and effects of AI (1)

Industry	Automation Potential	Effect on Productivity <sup>1</sup>	Effect on Demand <sup>2</sup>	Use Cases with High Potential Benefit
<b>Production</b>	60%	8.3%	2.2	<ul style="list-style-type: none"> <li>• Improved monitoring and automatic adjustment of production processes</li> <li>• Optimization of production and supply chain</li> <li>• On-demand production</li> </ul>
<b>Transportation &amp; Logistics</b>	60%	7.0%	3.2	<ul style="list-style-type: none"> <li>• Autonomous deliveries and transportation by trucks</li> <li>• Better traffic control and congestion reduction</li> <li>• Increased road safety</li> </ul>
<b>Retail Trade</b>	53%	13.2%	3.0	<ul style="list-style-type: none"> <li>• Better personalization and customization in design and production</li> <li>• Improved forecasting of product demand</li> <li>• Optimization of inventory and delivery management</li> </ul>

Data Source: PwC (2017, 2018a, 2018b), McKinsey (2017), Wirtz (2020b, 2021b, 2022)

## Table 6.3 Industry-specific potential and effects of AI (2)

<b>Energy &amp; Supply</b>	44%	6.8%	2.2	<ul style="list-style-type: none"> <li>• Intelligent meters and measuring systems (smart metering)</li> <li>• Higher efficiency of network operation and storage</li> <li>• Predictive maintenance of the infrastructure</li> </ul>
<b>Finance</b>	43%	8.4%	3.3	<ul style="list-style-type: none"> <li>• Better personalization of financial planning</li> <li>• Optimizing the prevention and detection of money laundering and fraud</li> <li>• Automated customer business</li> </ul>
<b>Technology, Media &amp; Communication</b>	41%	9.9%	3.1	<ul style="list-style-type: none"> <li>• Improved archiving, search and media recommendations</li> <li>• Generation of custom content</li> <li>• Better personalization and customizing for advertising and marketing</li> </ul>
<b>Health &amp; Social Affairs</b>	36%	27.9%	3.7	<ul style="list-style-type: none"> <li>• Better diagnostic support</li> <li>• Improved early detection of potential pandemics</li> <li>• Improved image diagnosis</li> </ul>

Data Source: PwC (2017, 2018a, 2018b), McKinsey (2017), Wirtz (2020b, 2021b, 2022)

## Table 6.4 Opportunities and risks of AI (1)

Dimensions	Opportunities	Risks
<b>Social &amp; Ethical</b>	<ul style="list-style-type: none"> <li>• Increased road safety and time savings for people through self-driving vehicles based on AI (e.g., Waymo)</li> <li>• Improved medical diagnostics and early detection of pandemics through AI systems (e.g., IBM Watson)</li> <li>• Increased public security by means of AI-based video surveillance and pattern recognition (e.g., ivisX)</li> <li>• ...</li> </ul>	<ul style="list-style-type: none"> <li>• Moral dilemmas of autonomous AI applications</li> <li>• Discrimination of people by AI algorithms</li> <li>• Lack of compatibility between mechanical and human value judgment</li> <li>• AI-based rule-setting for human behavior without a normative-ethical basis</li> <li>• Global technological arms race, especially in the military sector (e.g., AI-based autonomous weapons)</li> <li>• ...</li> </ul>

Source: Wirtz (2020b, 2021b, 2022)

## Table 6.4 Opportunities and risks of AI (2)

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<b>Legal &amp; Regulatory</b>	<ul style="list-style-type: none"><li>• Improved legal case analysis through AI-based e-discovery software (e.g., Exterro)</li><li>• Prediction of judgments with high accuracy by AI systems (e.g., case crunch)</li><li>• Improved risk assessment of the likelihood of recidivism of offenders through AI systems and reduction of the prison population</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Technology obedience and loss of control due to lack of governance of autonomous intelligent systems</li><li>• Threat to cybersecurity and data protection through AI cyberattacks</li><li>• Unclear responsibility and liability for decisions and actions of AI systems</li><li>• ...</li></ul>
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Source: Wirtz (2020b, 2021b, 2022)

## Table 6.4 Opportunities and risks of AI (3)

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**Technological & Implementation-Oriented**

- Improved AI-based data and information processing enables efficient and sustainable resource allocation
  - Higher IT security through improved AI-based behavior pattern recognition
  - Faster and easier access to the Internet and digital services using AI-based personal assistants (e.g., Amazon Alexa, Google Assistant and Duplex, Siri from Apple, or Microsoft's Cortana)
  - ...
- Loss of control over technologically autonomous AI systems
  - Security problems and failure of the AI system in mission-critical and life-critical situations due to immaturity of the AI-technology and lack of experience
  - Lack of specialization and expertise as well as a lack of skilled workers
  - High entry, transition and implementation costs
  - ...
- 

Source: Wirtz (2020b, 2021b, 2022)

## Table 6.4 Opportunities and risks of AI (4)

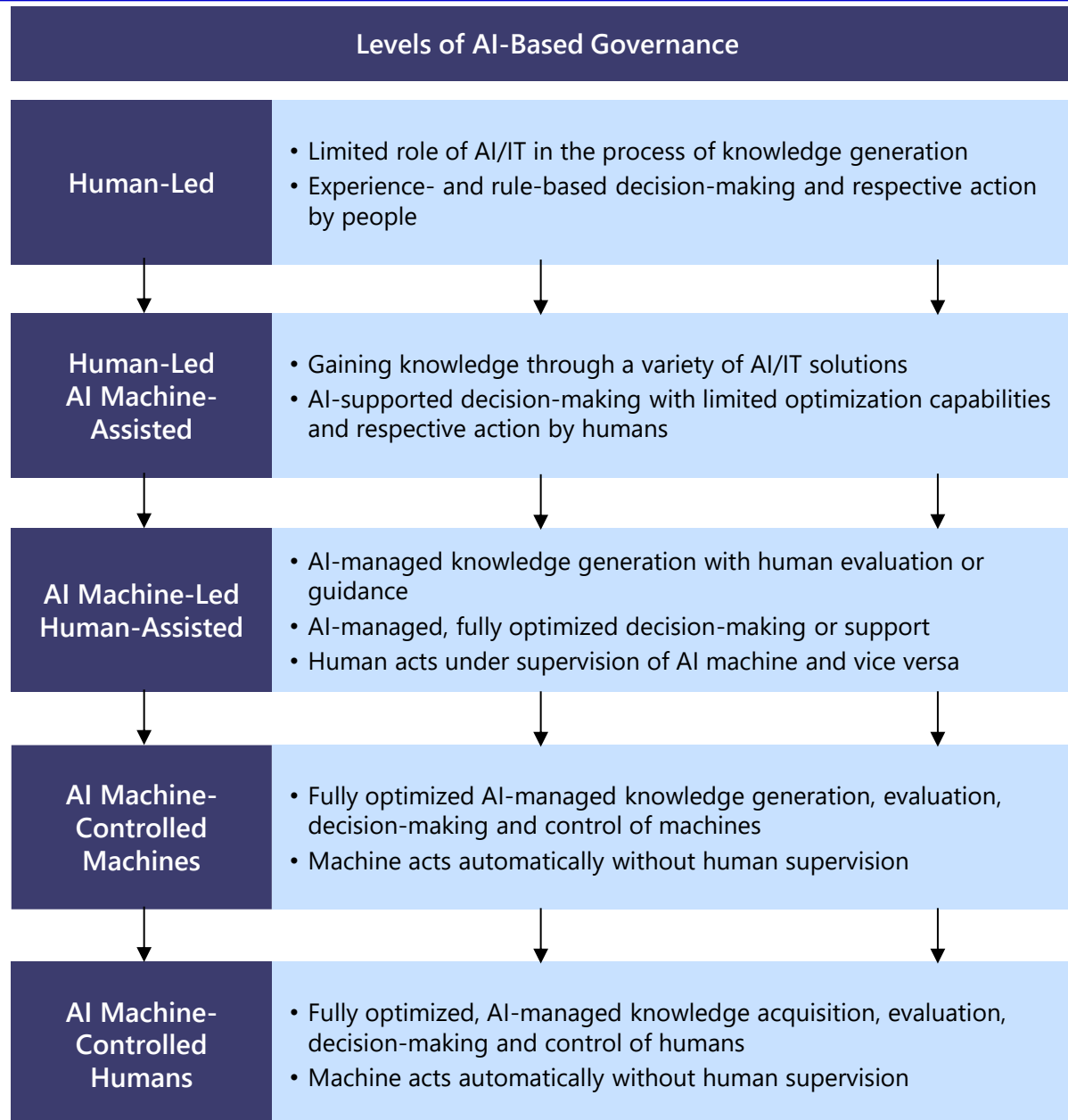
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<b>Economic</b>	<ul style="list-style-type: none"><li>• Free up work capacity and increase productivity by automating repetitive tasks using AI-based process automation systems and virtual agents</li><li>• Rationalization and process optimization through AI systems</li><li>• Considerable efficiency advantages through AI-based IoT applications</li><li>• Improved AI-based data analysis and improved financial and sales forecasting creates significant efficiencies and better management decisions</li><li>• ...</li></ul>	<ul style="list-style-type: none"><li>• Social resistance of workers to the introduction of AI systems</li><li>• Loss of management and control of processes due to transformation of human-machine and machine-machine interaction and increased autonomous AI automation</li><li>• Lack of social and customer-related acceptance and low trust into AI systems and manufacturer through AI failures</li><li>• Substitution and transformation of the labor market and unemployment, especially in production and manufacturing industry</li><li>• ...</li></ul>
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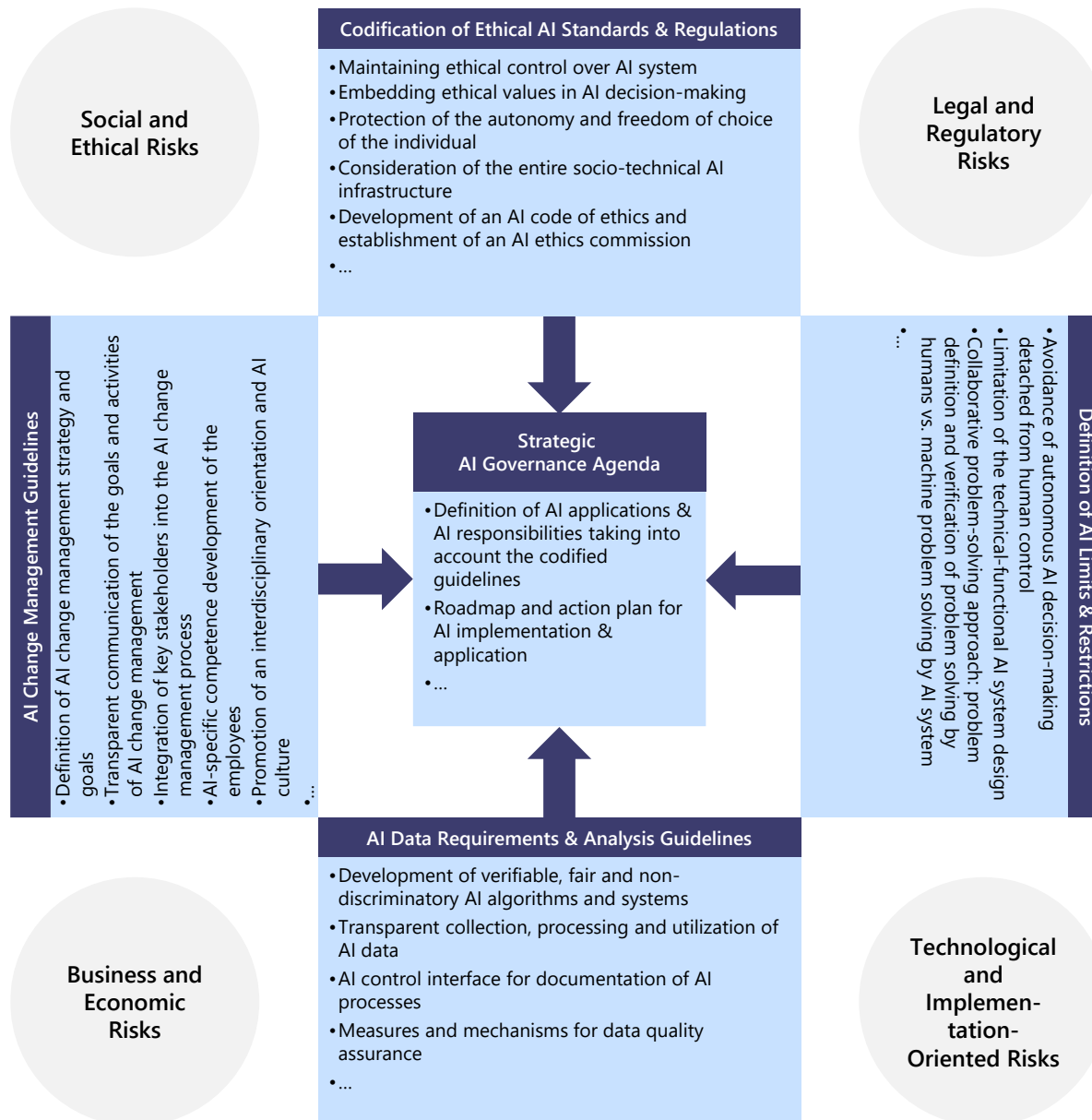
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Source: Wirtz (2020b, 2021b, 2022)

## Fig. 6.7 Levels of AI-based governance



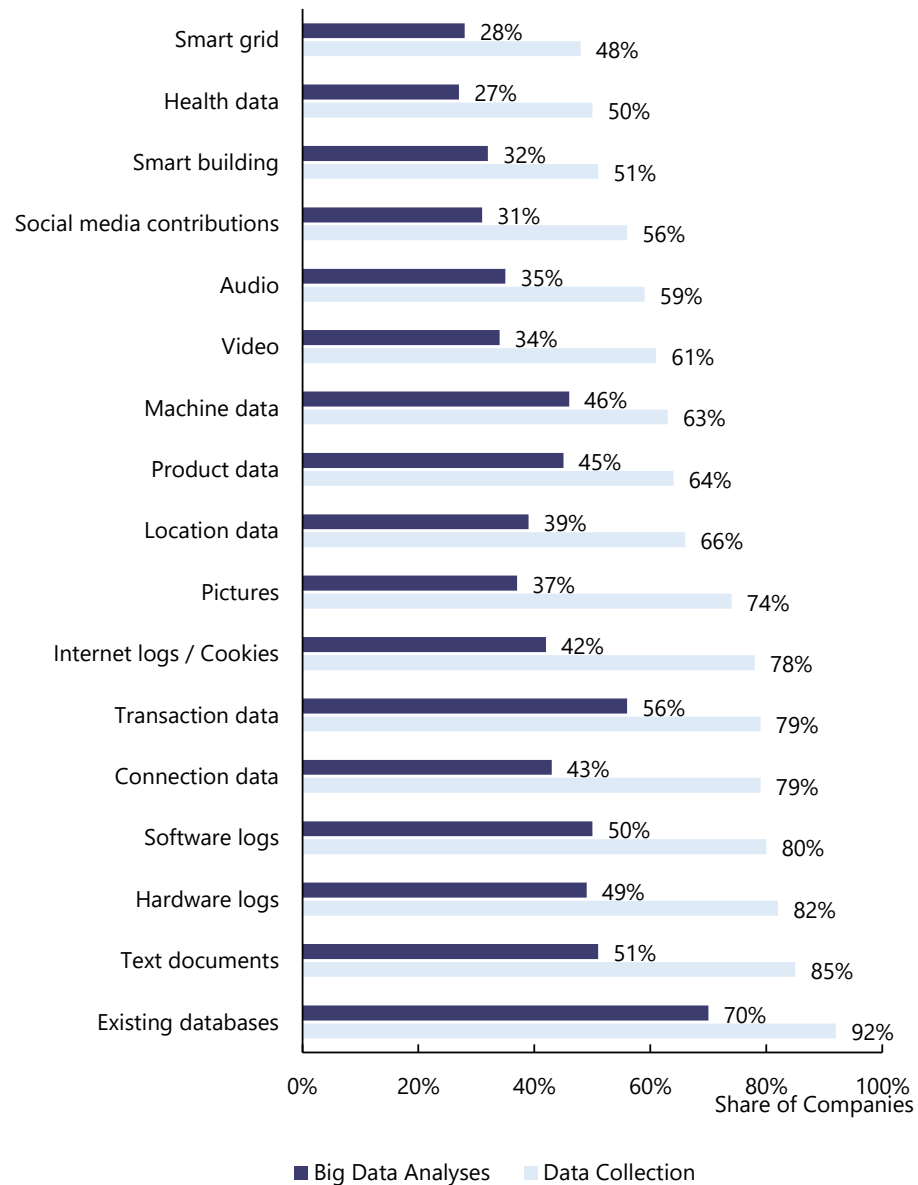
# Fig. 6.8 Strategic four AI governance model



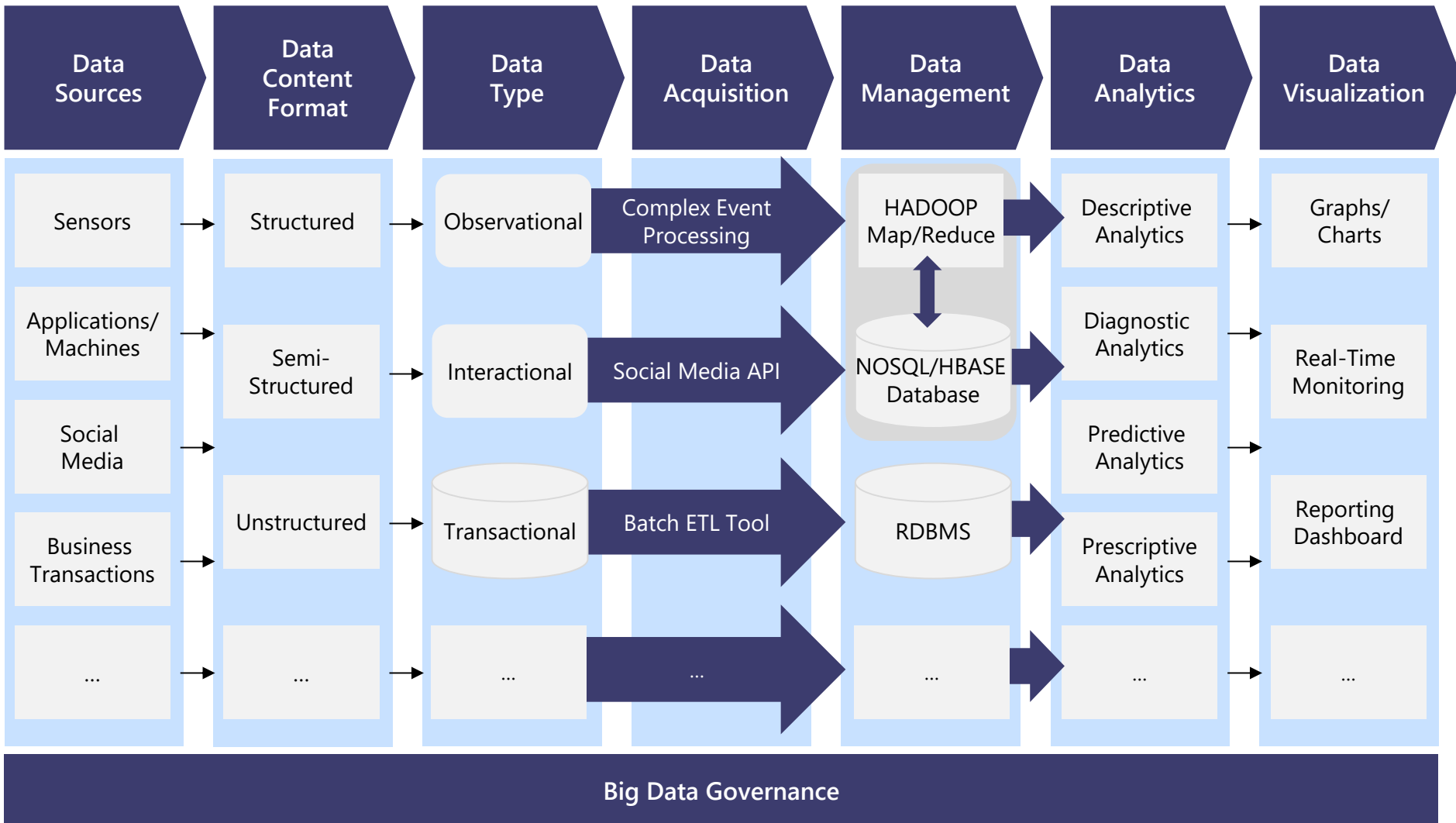
Source: Wirtz (2020b, 2021b, 2022)



**Fig. 6.10 Data processed by companies in big data analyses**

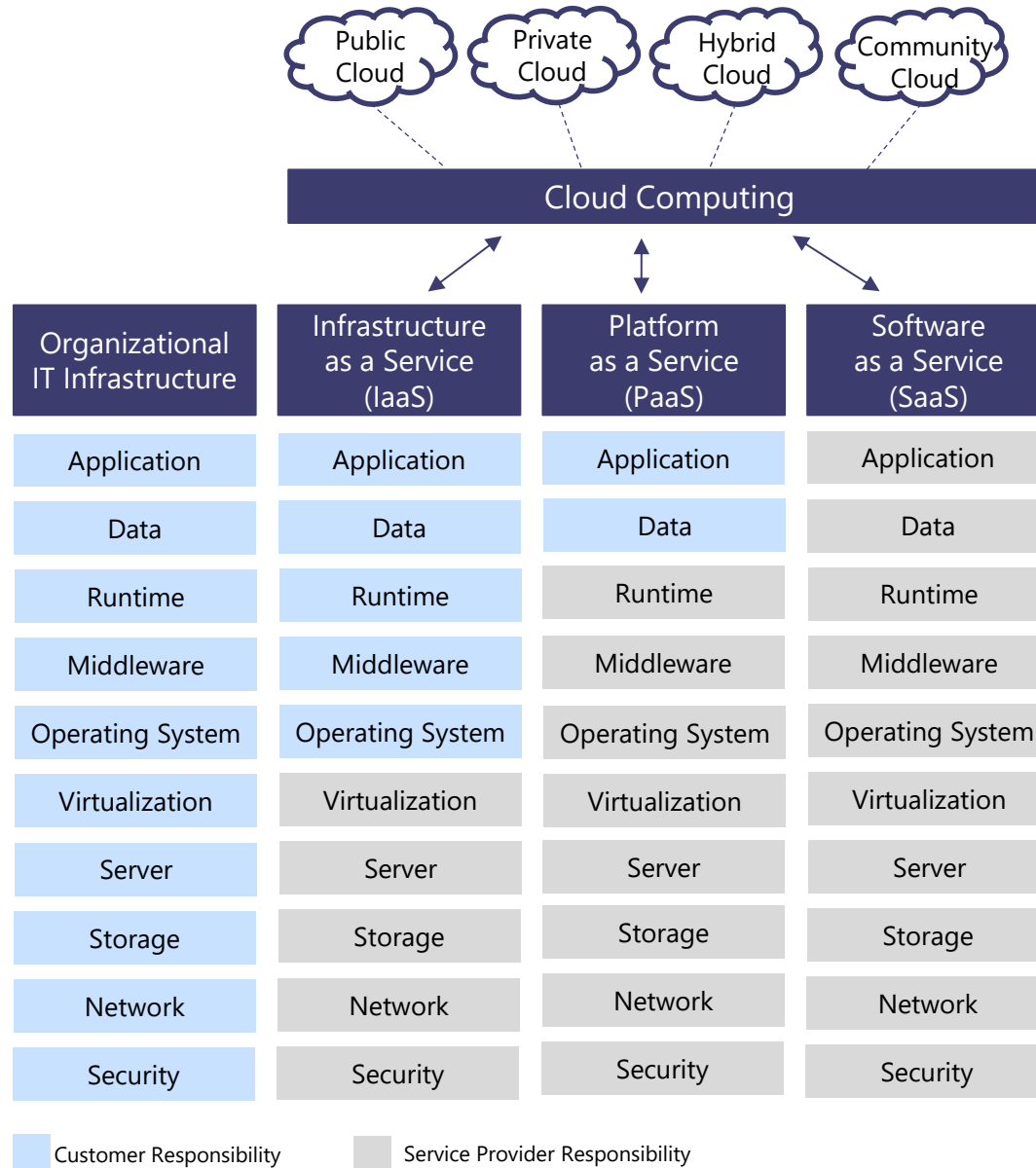


**Fig. 6.11 Exemplary illustration of a big data architecture**



Source: Wirtz (2018, 2020b, 2021b, 2022)

# Fig. 6.12 Provision and service models of cloud computing



Source: Wirtz (2016, 2020b, 2021b, 2022)

# Definition of Internet of Things

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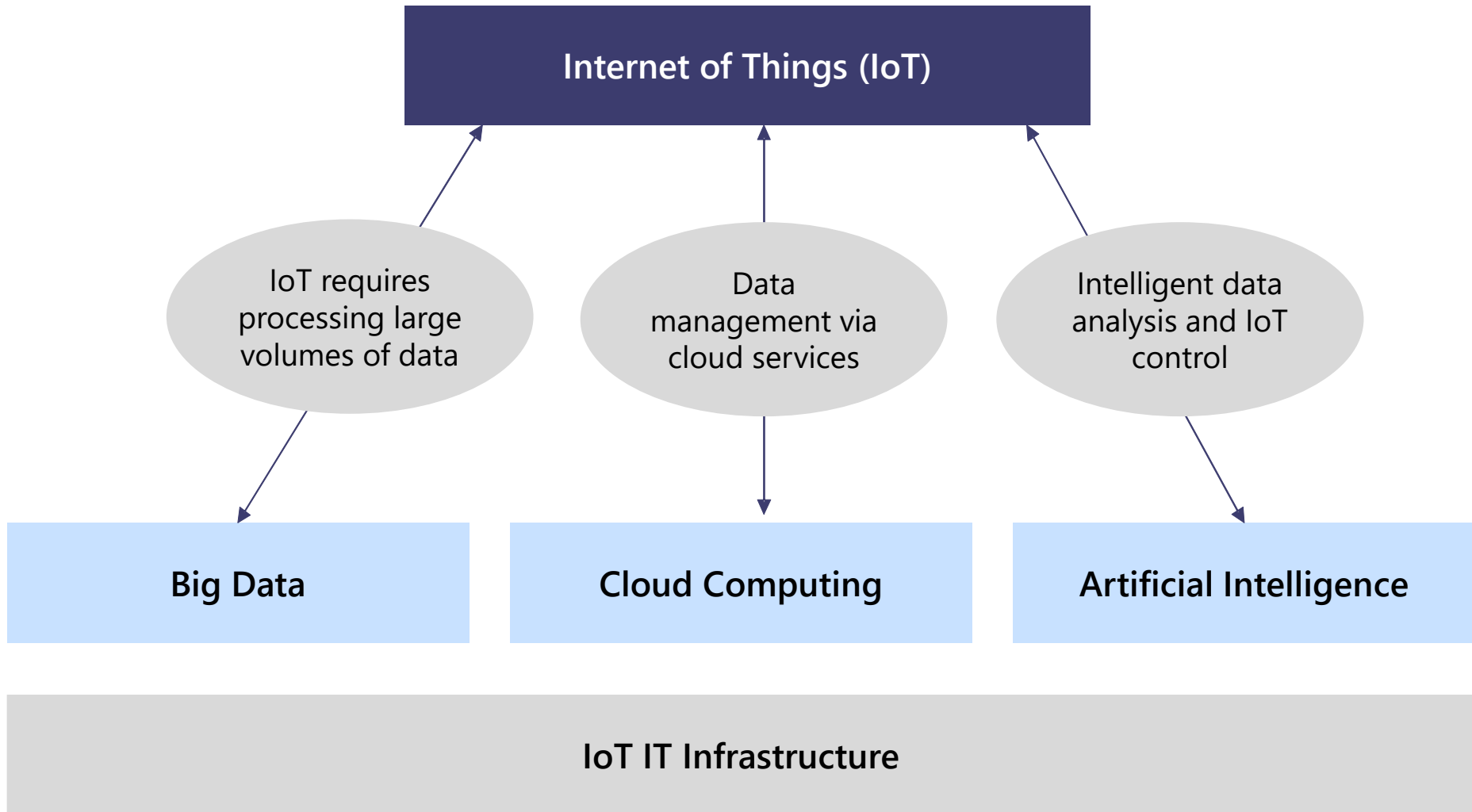
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Internet of Things refers to the Internet-based networking of physical and digital products, services, machines, sensors, and humans.

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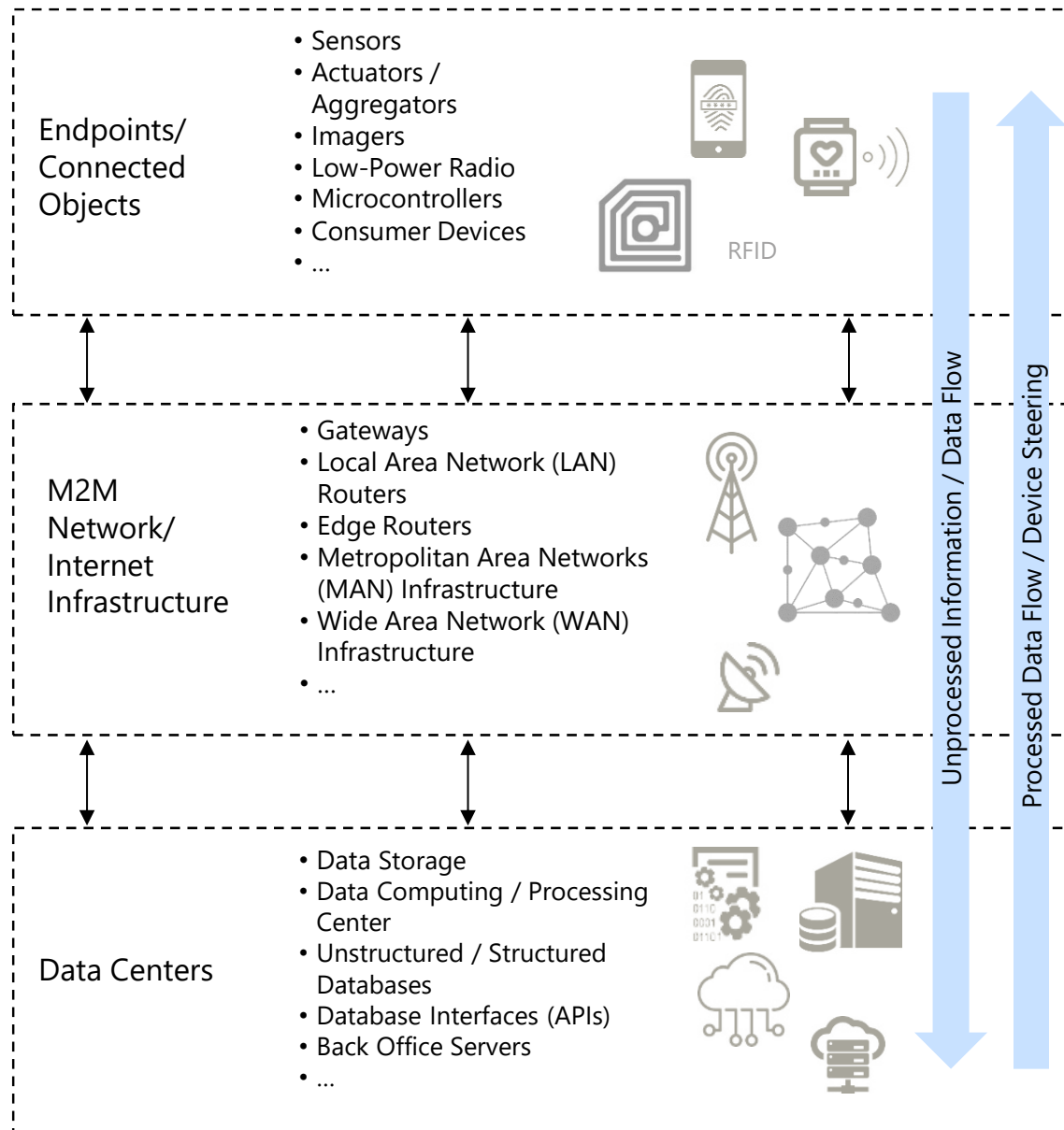
Source: [Wirtz \(2018, 2022\)](#)

**Fig. 6.13 Basic technological concepts of IoT**



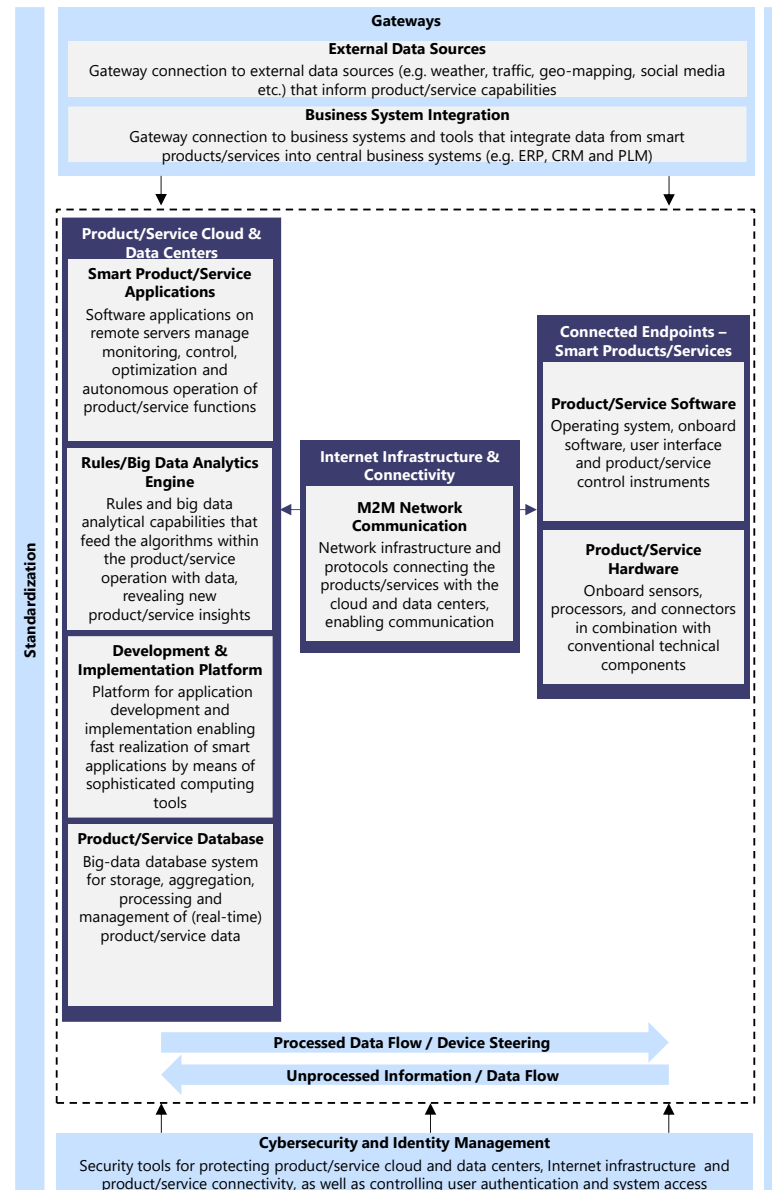
Source: Wirtz (2018, 2020b, 2021b, 2022)

## Fig. 6.14 IoT infrastructure



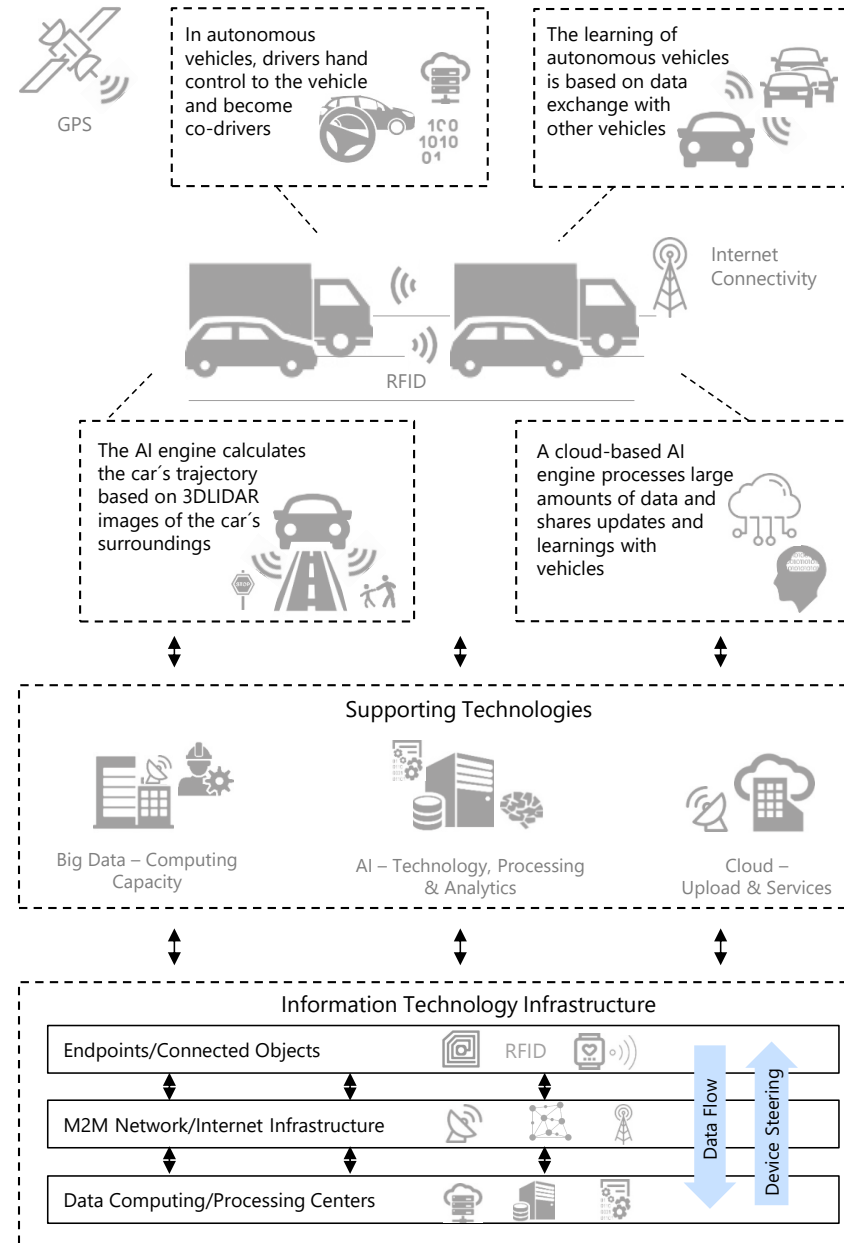
Source: Wirtz (2018, 2020b, 2021b, 2022)

# Fig. 6.15 Exemplary IoT-specific IT architecture





















Source: Wirtz (2020b, 2021b, 2022)

**Fig. 6.16 Illustrative example of IoT with application areas of enabling technologies**





## Fig. 6.17 Application areas of IoT

Setting	Description	Examples	Size in 2025*	
 <b>Factories</b>	Standardized production areas	Locations with repetitive workflows, such as farms and hospitals; operational efficiencies, asset utilization optimization and inventory	1,210 - 3,700	
 <b>Cities</b>	Urban areas	Public spaces and infrastructure in urban environments; resource management, environmental monitoring, smart meters, adaptive traffic control system	930 - 1,660	
 <b>Human</b>	Portable devices attached to or inside the human body	Devices (wearables and ingestibles) for monitoring and preserving human health and well-being; improved fitness, disease management, increased productivity	170 - 1,590	
 <b>Retail</b>	Places where consumers engage in commerce	Shops, malls, restaurants, banks, self-service checkout	410 - 1,160	
 <b>Worksites</b>	Custom production areas	Construction, mining, oil and gas; operating efficiency, safety and health, predictive maintenance	160 - 930	
 <b>Outside</b>	Outside of urban and other areas	Autonomous vehicles outside of urban environments, railroad tracks, shipment tracking, flight navigation; real-time routing	560 - 850	
 <b>Vehicles</b>	Inside of vehicles	Cars, trucks, trains, ships, airplanes, helicopters, condition-based maintenance, usage-based design,	210 - 740	
 <b>Home</b>	Inhabited buildings	Security and home automation control systems	200 - 350	
 <b>Offices</b>	Places where knowledge workers operate	Security and energy management in office buildings; increased productivity	70 - 150	

○ Low Potential ● High Potential

\*Potential economic impact of IoT in 2025 [in billion USD]

Data Source: McKinsey Global Institute (2015), Wirtz (2020b, 2021b, 2022)

**Fig. 6.18 Key opportunities and challenges of industry 4.0 from a business perspective**

### IoT Opportunities

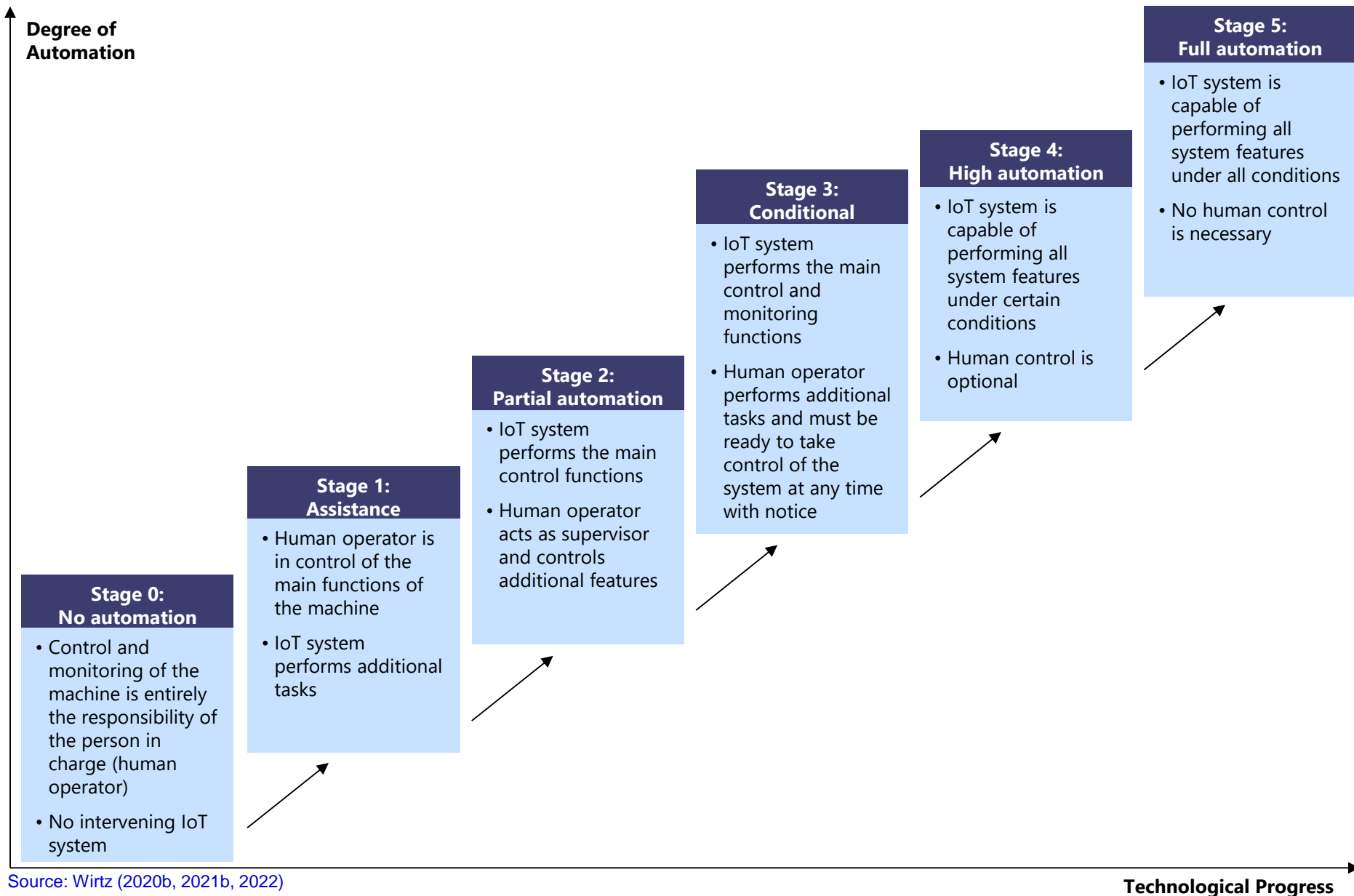
- Improved planning and controlling
- Higher customer satisfaction
- Increased flexibility in production
- Faster time to market
- Improved quality
- Individualization of products
- ...

### IoT Challenges

- Uncertain economic benefits and exceeding investments
- Insufficient qualifications of employees
- Lack of regulations, standards and forms of certification
- Uncertain legal situation regarding the use of external data
- Low maturity level of required technologies
- Unresolved questions concerning data security
- ...

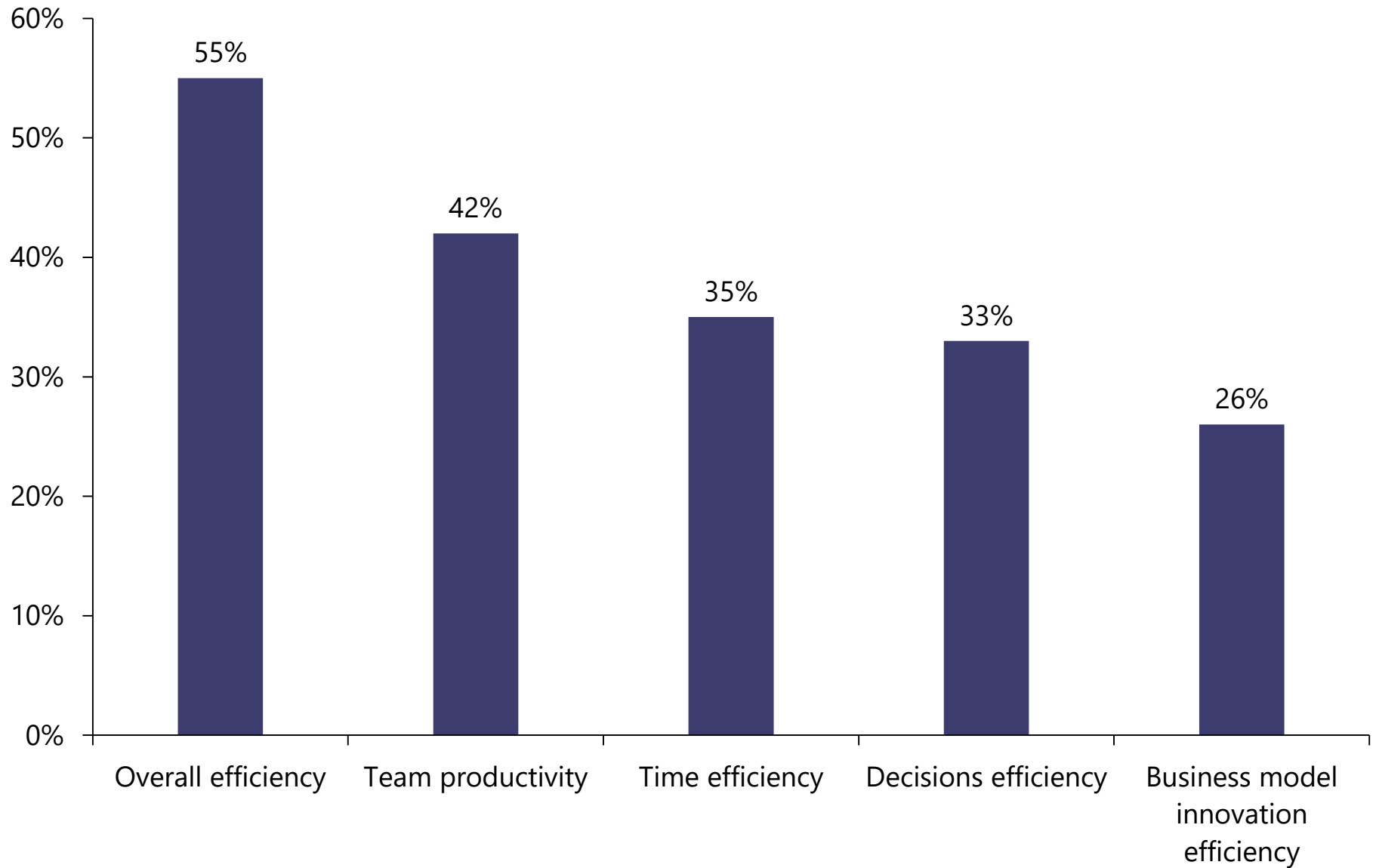
Source: Wirtz (2020b, 2021b, 2022)

## Fig. 6.19 Stages of industrial automation



Source: Wirtz (2020b, 2021b, 2022)

**Fig. 6.20 IoT benefit increased efficiency**

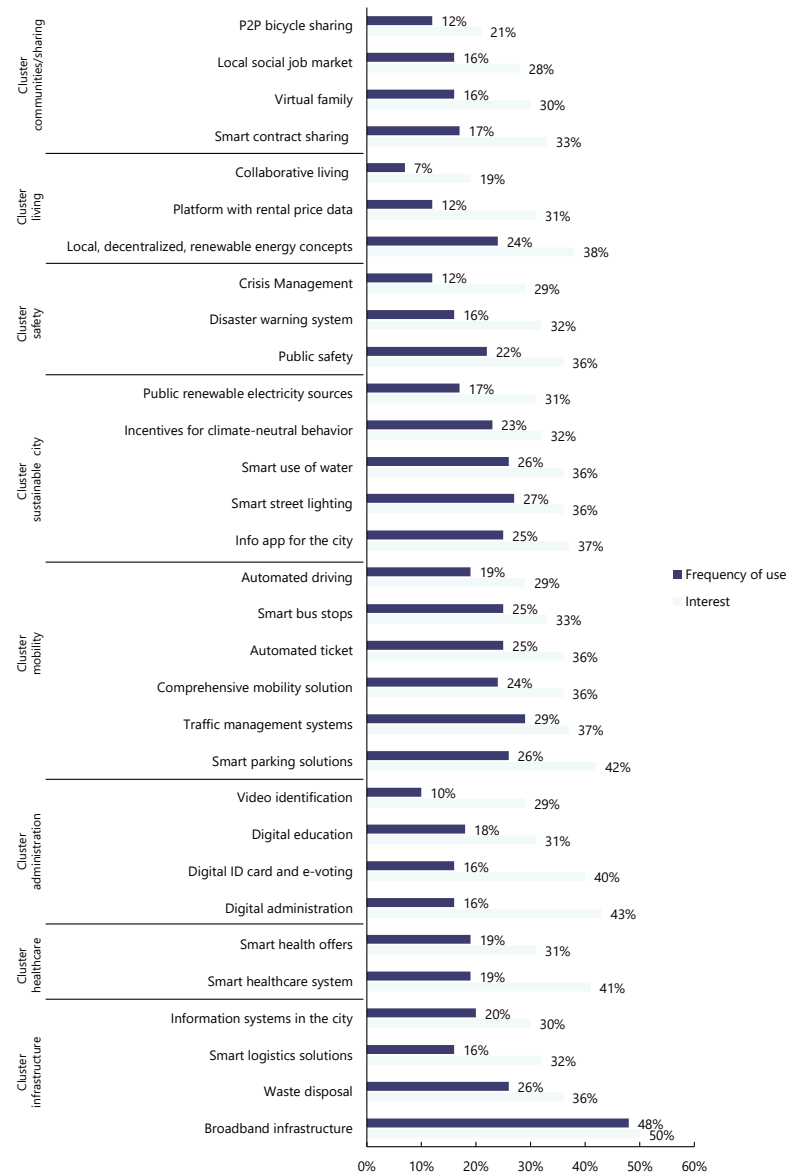


**Table 6.5 Smart home users by age**

	Average	18-25	26-35	36-45	46-60	61+
Overall	24%	33%	46%	29%	14%	15%
Smart appliance	16%	18%	33%	18%	6%	6%
Smart thermostat	14%	14%	22%	16%	9%	9%
Smart lights	13%	25%	25%	15%	6%	6%
Other	7%	6%	14%	8%	3%	3%

Data Source: Walker Sands (2017), Wirtz (2021b, 2022)

# Fig. 6.21 Interest in smart city solutions and frequency of use



Data Source: Wyman (2020), Wirtz (2021b, 2022)

**Fig. 6.22 Success factors of IoT**

<b>Digital Business Model Innovation/ Diversification Competence</b> <ul style="list-style-type: none"><li>• Business model development in the innovative IoT environment</li><li>• Creation of business model innovations for IoT</li><li>• Diversification ability of existing IoT solutions in other industries/ applications</li></ul>	<b>System Technology Competence</b> <ul style="list-style-type: none"><li>• Combinability of software &amp; hardware IoT solutions</li><li>• IoT service/platform customization</li><li>• Management of IT platform &amp; infrastructure</li><li>• Data security</li></ul>
<b>Integration Ability of Complex IoT Services</b> <ul style="list-style-type: none"><li>• Horizontal &amp; vertical integration ability of application levels</li><li>• Integrated service offers</li><li>• Complexity management</li></ul>	<b>Digital Intelligence Competence</b> <ul style="list-style-type: none"><li>• Development of intelligent IoT service solutions</li><li>• Development of IoT-artificial intelligence/ big data software &amp; analytics</li><li>• Networking capability with other IoT/ AI solutions</li></ul>

Source: Wirtz (2018, 2020b, 2021b, 2022)

# Chapter 6

## Review questions, topics for discussion and online exercises

### Chapter 6

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Present the different stages and functionalities of AI.
2. Explain the AI framework.
3. Describe the different types of provision and service models of cloud computing and explain differences in terms of the organizational IT infrastructure.
4. Describe the concept of the Internet of Things.
5. Explain the development stages of industrial automation in the field of IoT.



##### Topics for classroom discussion and team debates

1. In a not too distant future, there will be AI machines that are superior to human work in many areas and will replace it to a large extent. Discuss the ethical aspects of such a situation and in particular the impact on the labor market and possible mass unemployment.
2. Discuss on the basis of the levels of AI-based governance how socially desirable it is to have AI machines control humans.
3. The IoT has considerable potential for change in our economy. Discuss the advantages and disadvantages of the technological development of IoT for the society and the economy.



##### Online Exercises

1. Enter <https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence>. Explore the site. Derive the AI goals of the European Commission and elaborate the new rules and actions for excellence in AI.
2. Visit <https://trumpwhitehouse.archives.gov/briefings-statements/white-house-launches-national-artificial-intelligence-initiative-office/> and compare the objectives and contents with those of the European Commission.
3. Enter <https://www.cisa.gov/sites/default/files/publications/CISA%20IoT%20White%20Paper%203.6.19%20-%20FINAL.pdf>. Explore the site and work out important aspects of the Internet of Things for Public Safety.



# **Chapter 7: Social Media and Public Disinformation**

## Table 7.1 Most frequently used social media services in the world

Platform	Activity in %
Facebook	17.2
YouTube	13.8
WhatsApp	13.8
FB Messenger	9.0
Weixin / WeChat	8.0
Instagram	6.9
Douyin/TikTok	5.5
QQ	5.0
Qzone	3.6
Sina Weibo	3.6
Reddit	3.0
Kuaishou	2.8
Snapchat	2.7
Twitter	2.7
Pinterest	2.5

Data Source: We Are Social (2020), Wirtz (2021b, 2022)

**Fig. 7.1 Web 2.0 vs. social media**

	Web 2.0	Social Media
Characteristics	<ul style="list-style-type: none"><li>• Users can continuously contribute and modify web content</li><li>• Diverse basic functions allow the use of the Web 2.0 (see examples)</li><li>• Ideological and technological basis for social media</li></ul>	<ul style="list-style-type: none"><li>• Group of Internet applications based on Web 2.0</li><li>• Allows creating and exchanging user-generated content</li></ul>
Examples	<ul style="list-style-type: none"><li>• Adobe Flash</li><li>• RSS (Really Simple Syndication)</li><li>• AJAX (Asynchronous Java Script)</li></ul>	<ul style="list-style-type: none"><li>• Social networking (e.g., Facebook)</li><li>• Video sharing platforms (e.g., YouTube)</li><li>• Wikis (e.g., Wikipedia)</li></ul>

Source: Wirtz (2016, 2021b, 2022)

# Definition of Social Media

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Social media are applications, services, and platforms on the Internet with high, mostly interactive and personalizable creative potential. They are characterized by the active generation and creation of diverse content through the cooperative participation of users. User-generated content in conjunction with platform services forms social networks that enable users to network in a communicative and content-related way.

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Source: Wirtz and Ullrich (2008), Wirtz (2016, 2020b, 2022)

# Definition of Social Media Management

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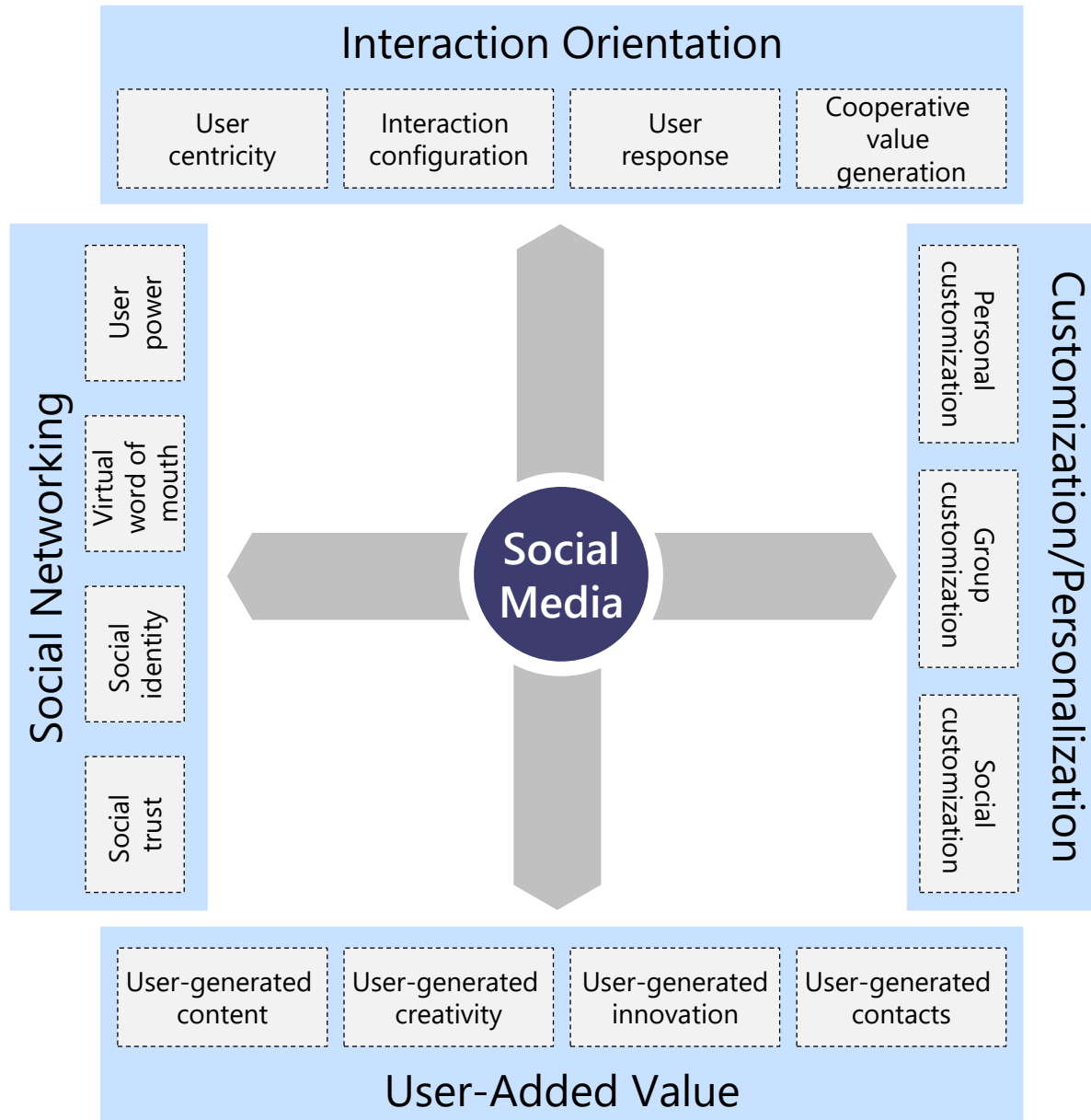
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The term social media management describes the initiation as well as the support, management and maintenance of transactions between economic partners via social media tools

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Source: [Wirtz \(2013a, 2018, 2022\)](#)

**Fig. 7.2 Social Media Four-Factor Model**



Source: Wirtz and Daiser (2017b), Wirtz (2013a, 2021b, 2022)

## Table 7.2 Overview of social media applications (1)

Application	Business Model	Service Offer	User Value
Social Networking e.g., facebook.com	<ul style="list-style-type: none"> <li>- Compilation and provision of user-generated content on a single platform</li> <li>- Revenues through ad sales/data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Self-presentation of the user</li> <li>- Networking among users</li> <li>- Connection between users and content</li> </ul>	<ul style="list-style-type: none"> <li>- Mediation of social contacts through digital interaction</li> <li>- High suitability for use in the mobile context (mobile networking)</li> </ul>
Blogs & RSS Feeds e.g., blogger.com	<ul style="list-style-type: none"> <li>- Systematization and compilation of online diaries</li> <li>- Revenues through ad sales/usage or subscription fees/data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of an authoring tool for the creation of blogs</li> <li>- Hosting of blogs</li> <li>- Categorization of blogs</li> </ul>	<ul style="list-style-type: none"> <li>- Unfiltered personal publishing for "everyone"</li> <li>- Visual presentation of content</li> </ul>
Microblogs, e.g., twitter.com	<ul style="list-style-type: none"> <li>- Compilation and provision of user-generated content on a single platform</li> <li>- Revenues through ad sales/data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Special type of blogging to quickly publish short messages</li> </ul>	<ul style="list-style-type: none"> <li>- Fast and convenient opportunity to publish</li> <li>- High suitability for use in the mobile context</li> </ul>
File Exchange & Sharing, e.g., youtube.com	<ul style="list-style-type: none"> <li>- Archiving and systematization of user-generated content (e.g., videos)</li> <li>- Revenues through ad sales/data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of online storage</li> <li>- Systematization of content, e.g., through categorization and ratings</li> </ul>	<ul style="list-style-type: none"> <li>- Broadcasting for "everyone"</li> <li>- Access to a large number of users/audience</li> </ul>

Source: Enderle and Wirtz (2008), Wirtz (2011b, 2021b, 2022)

## Table 7.2 Overview of social media applications (2)

<p>Rating Portals e.g., yelp.com</p>	<ul style="list-style-type: none"> <li>- Aggregation and systematization of product- and service-related information</li> <li>- Revenues from agency commissions and through ad sales/data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Aggregation of product and service information</li> <li>- User-generated reviews of products and services</li> <li>- Price comparisons with links to online stores</li> </ul>	<ul style="list-style-type: none"> <li>- Independent product/service reviews from users</li> <li>- Simplifying and supporting decision-making and the buying process</li> </ul>
<p>Instant Messengers, e.g., whatsapp.com</p>	<ul style="list-style-type: none"> <li>- Exchange of text, audio, and video messages and content</li> <li>- Revenues through subscription fees, cooperation with companies, and data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Instant exchange of push messages</li> <li>- Support of data, audio and video streams</li> </ul>	<ul style="list-style-type: none"> <li>- Fast and convenient exchange of messages</li> <li>- High suitability for use in the mobile context</li> </ul>
<p>Podcasts e.g., podcasts.com</p>	<ul style="list-style-type: none"> <li>- Provision of audio or video content</li> <li>- Revenues through pay-per-use, subscription, and ad sales</li> </ul>	<ul style="list-style-type: none"> <li>- Topic-specific audio and video content</li> <li>- Possibility of subscription</li> </ul>	<ul style="list-style-type: none"> <li>- Location and time-independent use of content</li> </ul>

Source: Enderle and Wirtz (2008), Wirtz (2011b, 2021b, 2022)



## Table 7.2 Overview of social media applications (3)

Wikis e.g., wikipedia.com	<ul style="list-style-type: none"> <li>- Collection, systematization, and further development of information</li> <li>- Revenues from donations</li> </ul>	<ul style="list-style-type: none"> <li>- Tools for creating and editing content by users</li> <li>- Provision of a platform for searching and presenting information/ knowledge</li> </ul>	<ul style="list-style-type: none"> <li>- Aggregation of subject-specific information</li> <li>- Freedom concerning content/authors</li> <li>- Users as a collective editorial</li> </ul>
Tagging/Social Bookmarking e.g., delicious.com	<ul style="list-style-type: none"> <li>- Classification and systematization of Internet offers</li> <li>- Revenues, e.g., from the sale of click streams for data mining purposes</li> </ul>	<ul style="list-style-type: none"> <li>- Central archiving and ubiquitous availability of bookmarks</li> <li>- Tagging of bookmarks</li> <li>- Access to link collections of other users</li> </ul>	<ul style="list-style-type: none"> <li>- Individual editorial workup of the Internet</li> </ul>
Online Forums e.g., topix.com	<ul style="list-style-type: none"> <li>- Compilation, classification, and provision of user-generated content on a single platform</li> <li>- Revenues through ad sales/data mining</li> </ul>	<ul style="list-style-type: none"> <li>- Exchange and archiving of thoughts, opinions, and experiences</li> </ul>	<ul style="list-style-type: none"> <li>- Increase in knowledge</li> <li>- Problem-solving through community</li> <li>- Structured documentation of topics and opinions</li> </ul>

Source: Enderle and Wirtz (2008), Wirtz (2011b, 2021b, 2022)

## Table 7.2 Overview of social media applications (4)

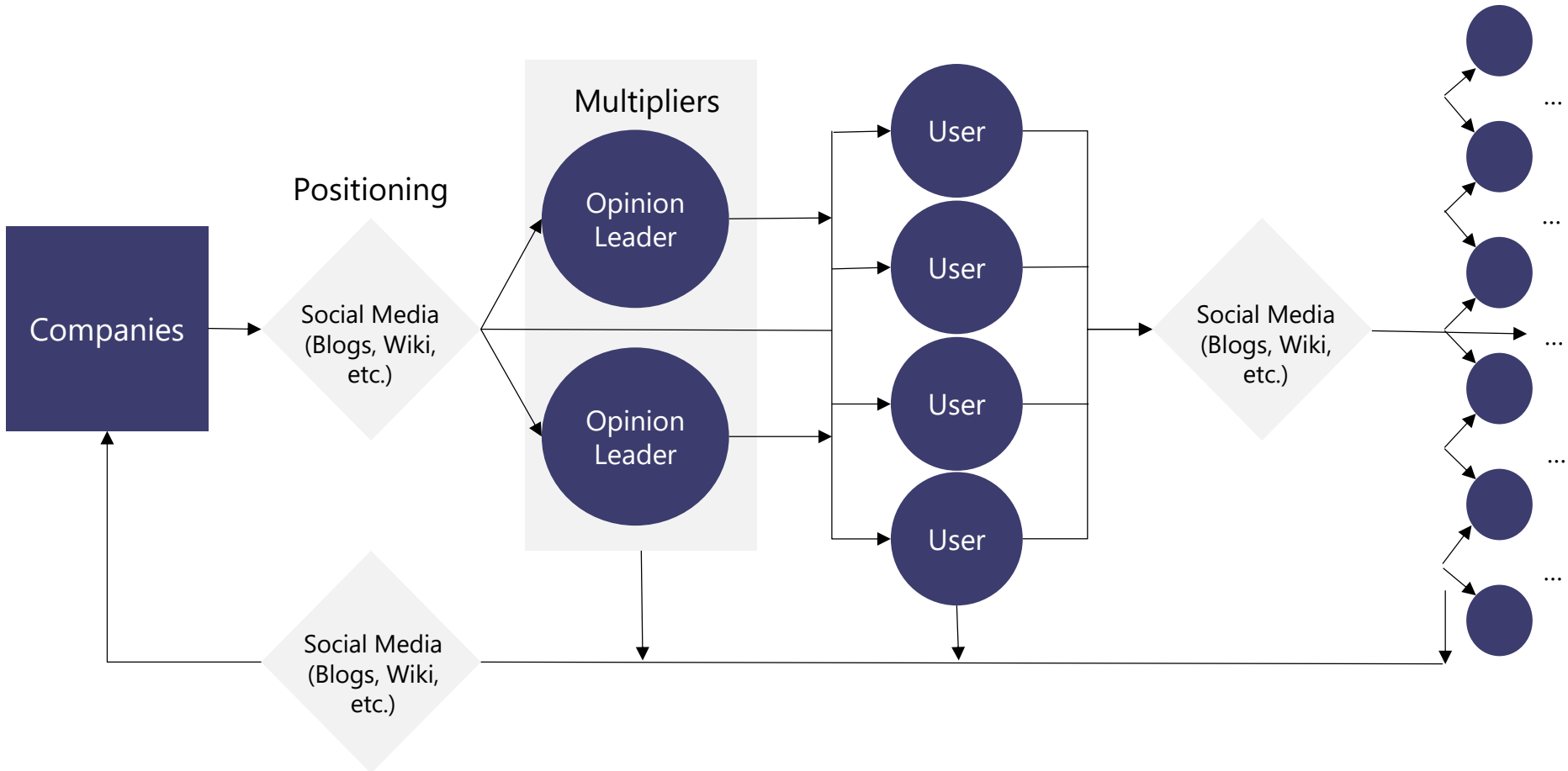
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Mashups e.g., parkingcarma.com	<ul style="list-style-type: none"><li>- Combination of multiple online software products/API services</li><li>- Revenues through ad sales and/or membership fees</li></ul>	<ul style="list-style-type: none"><li>- Creation of new media content by recombining already existing content</li></ul>	<ul style="list-style-type: none"><li>- Exploitation of synergies between different social media applications</li><li>- Time savings</li></ul>
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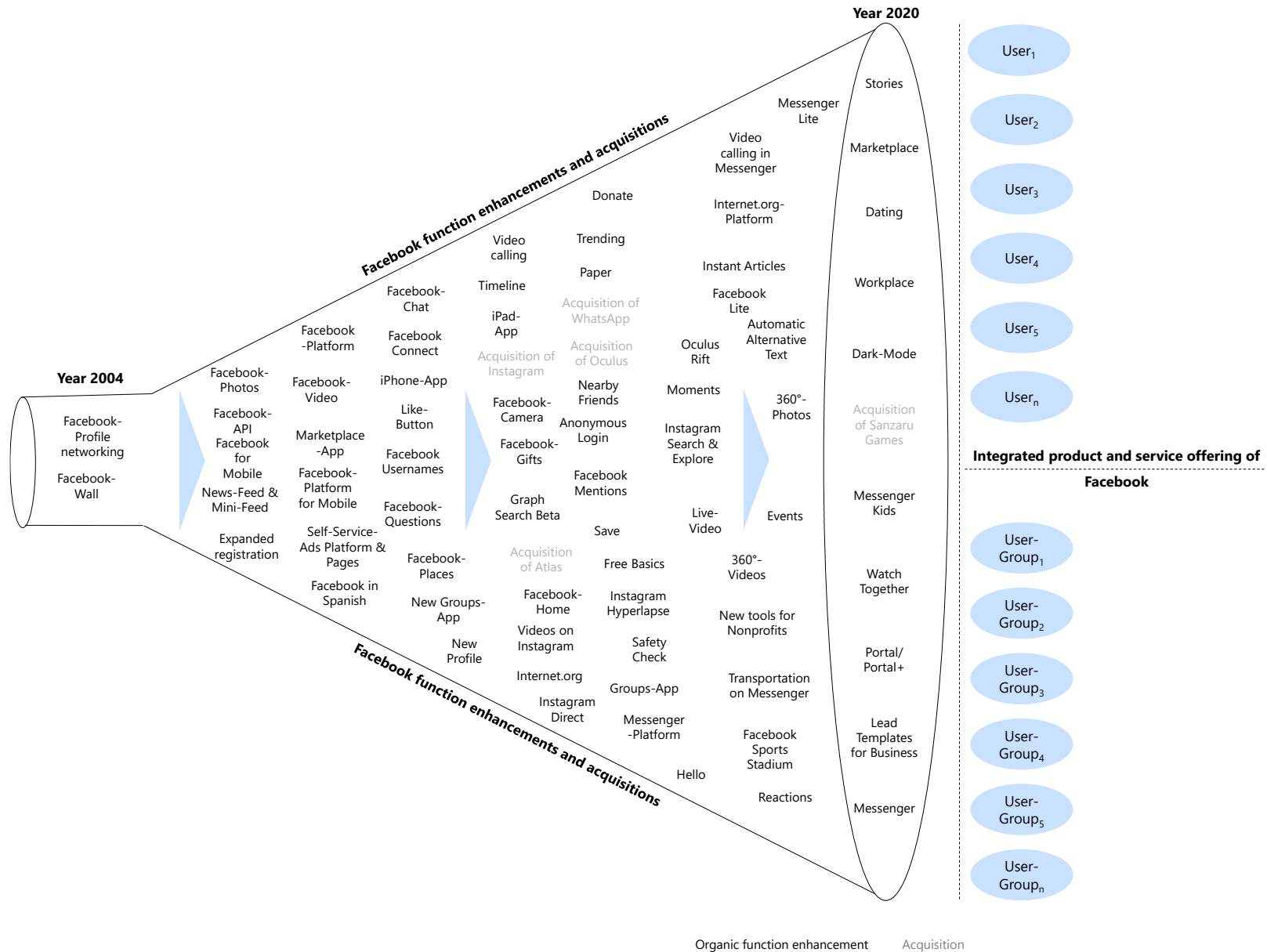
Source: Enderle and Wirtz (2008), Wirtz (2011b, 2021b, 2022)

**Fig. 7.3 Multiple effect of social media**



Source: Wirtz (2012, 2021b, 2022)

# Fig. 7.4 Development of the integrated product and service offering of Facebook

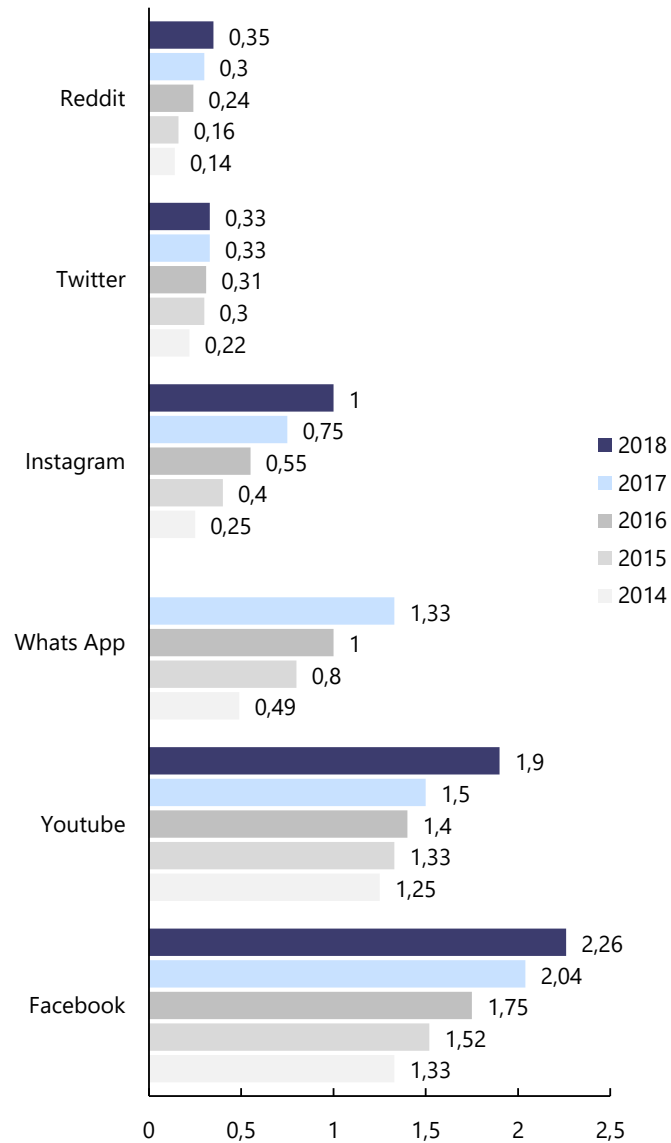


## Table 7.3 Social media users and their activities

User groups with different involvement	Social media activities
<b>Inactive users</b>	<ul style="list-style-type: none"> <li>● No interest in a social media presence</li> <li>● No sign of any activity on social media applications</li> </ul>
<b>Spectators</b>	<ul style="list-style-type: none"> <li>● Consume content on different social media platforms such as product review sites, blogs, streaming platforms</li> <li>● No contribution of own content</li> </ul>
<b>Newcomers</b>	<ul style="list-style-type: none"> <li>● Regular maintenance of the profiles on social media platforms</li> <li>● Open to other social networking sites</li> </ul>
<b>Collectors</b>	<ul style="list-style-type: none"> <li>● Use of RSS feeds</li> <li>● Use of bookmarking services</li> </ul>
<b>Critics</b>	<ul style="list-style-type: none"> <li>● Active participation in product rating portals</li> <li>● Modification of articles on wikis</li> <li>● Commenting on blog posts</li> </ul>
<b>Creatives</b>	<ul style="list-style-type: none"> <li>● Release own publications on blogs and other sites</li> <li>● Customize design of own websites</li> <li>● Upload of videos, music, or other media contents</li> <li>● Publication of own articles</li> </ul>

Source: Wirtz (2013a, 2021b, 2022)

**Fig. 7.5 Development of monthly social media users in billions**

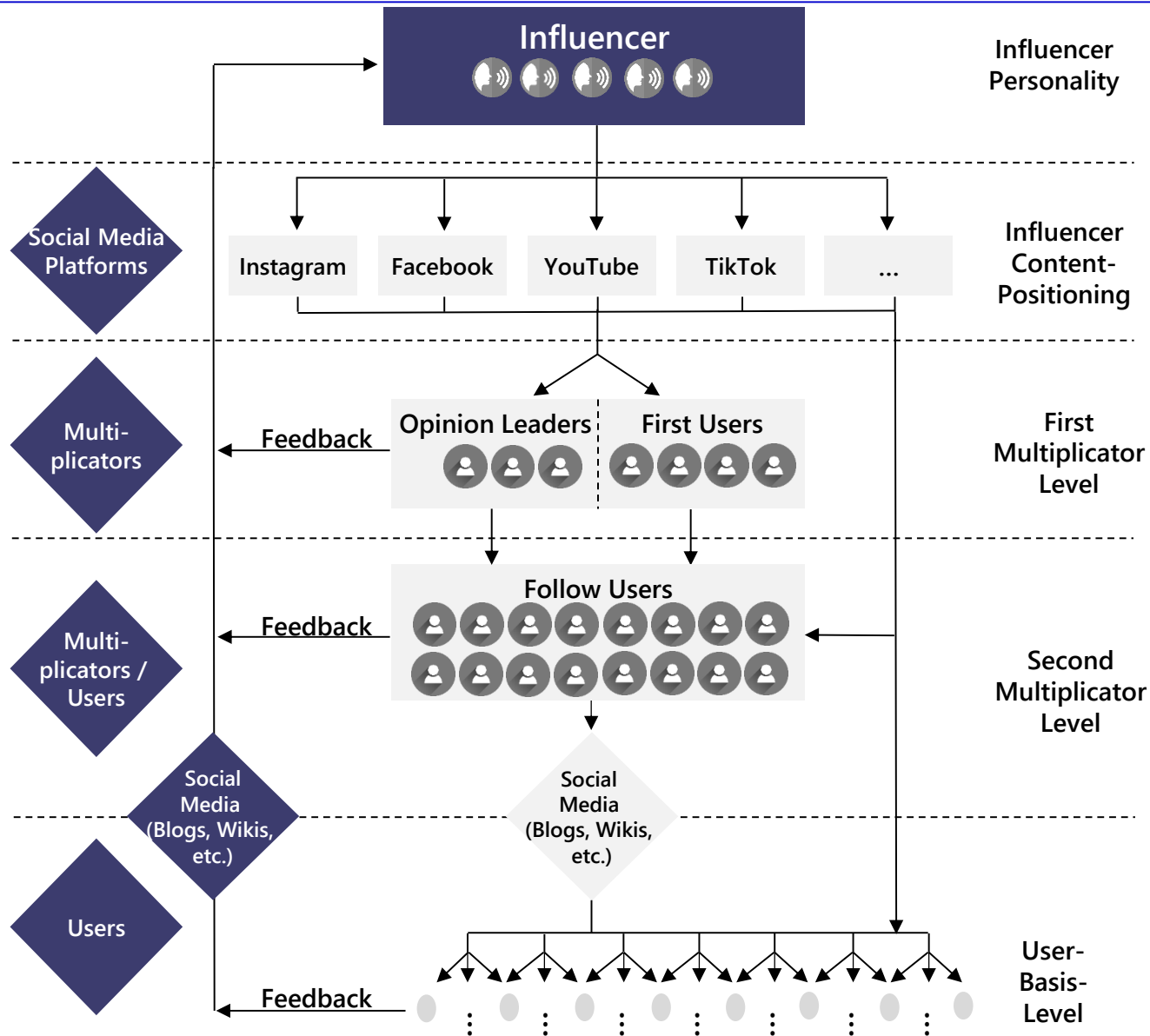


## Table 7.4 US Facebook user profile

Age	Male	Female
13-17	1.1%	1.3%
18-24	7.0%	7.5%
25-34	13.6%	13.6%
35-44	8.8%	10.1%
45-54	6.6%	7.9%
55-64	4.8%	7.0%
65+	4.1%	6.6%

Data Source: NapoleonCat (2020), Wirtz (2021b, 2022)

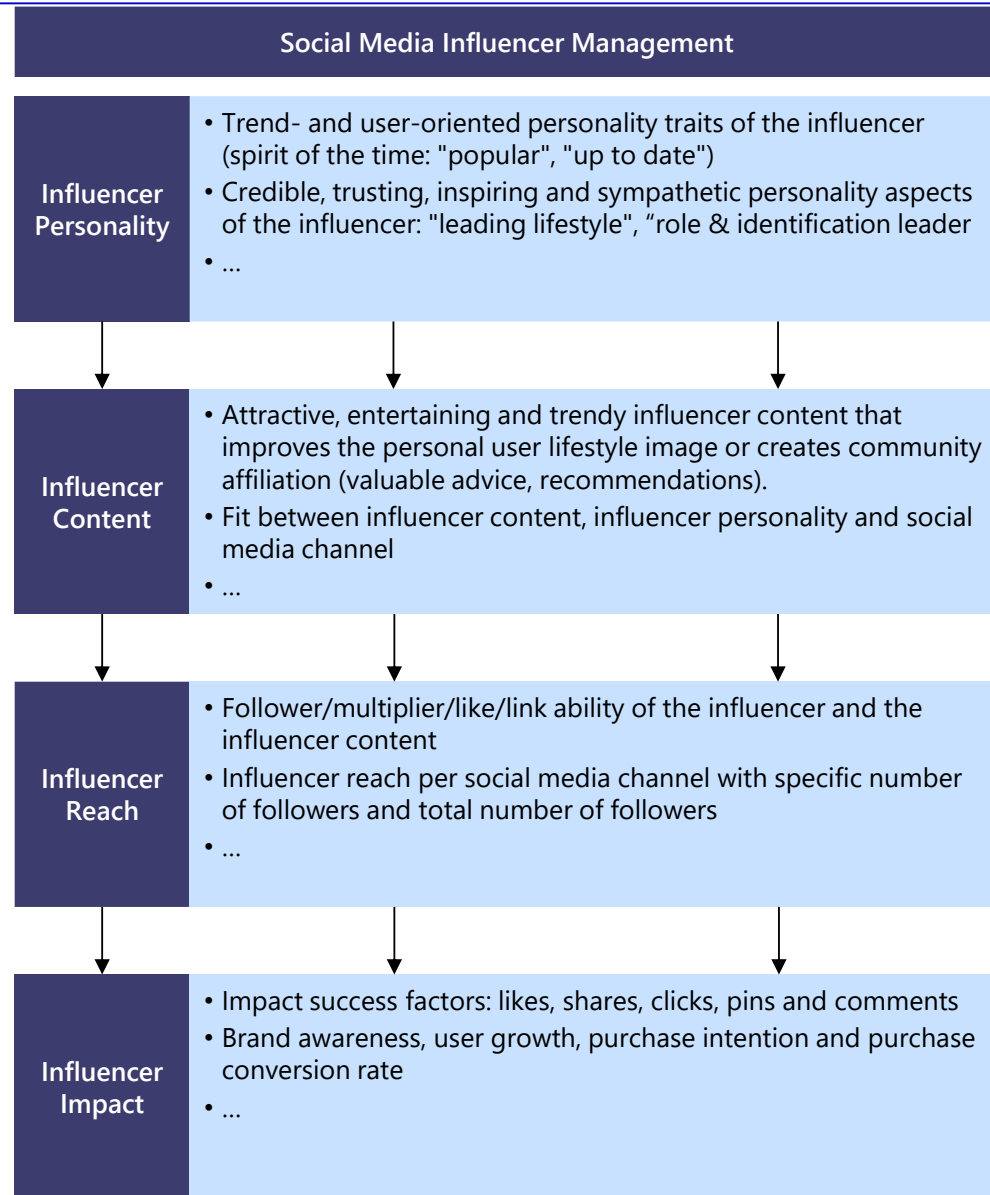
**Fig. 7.6 Influencer-communication-follower (ICF) model**



Source: Wirtz (2020b, 2021b, 2022)

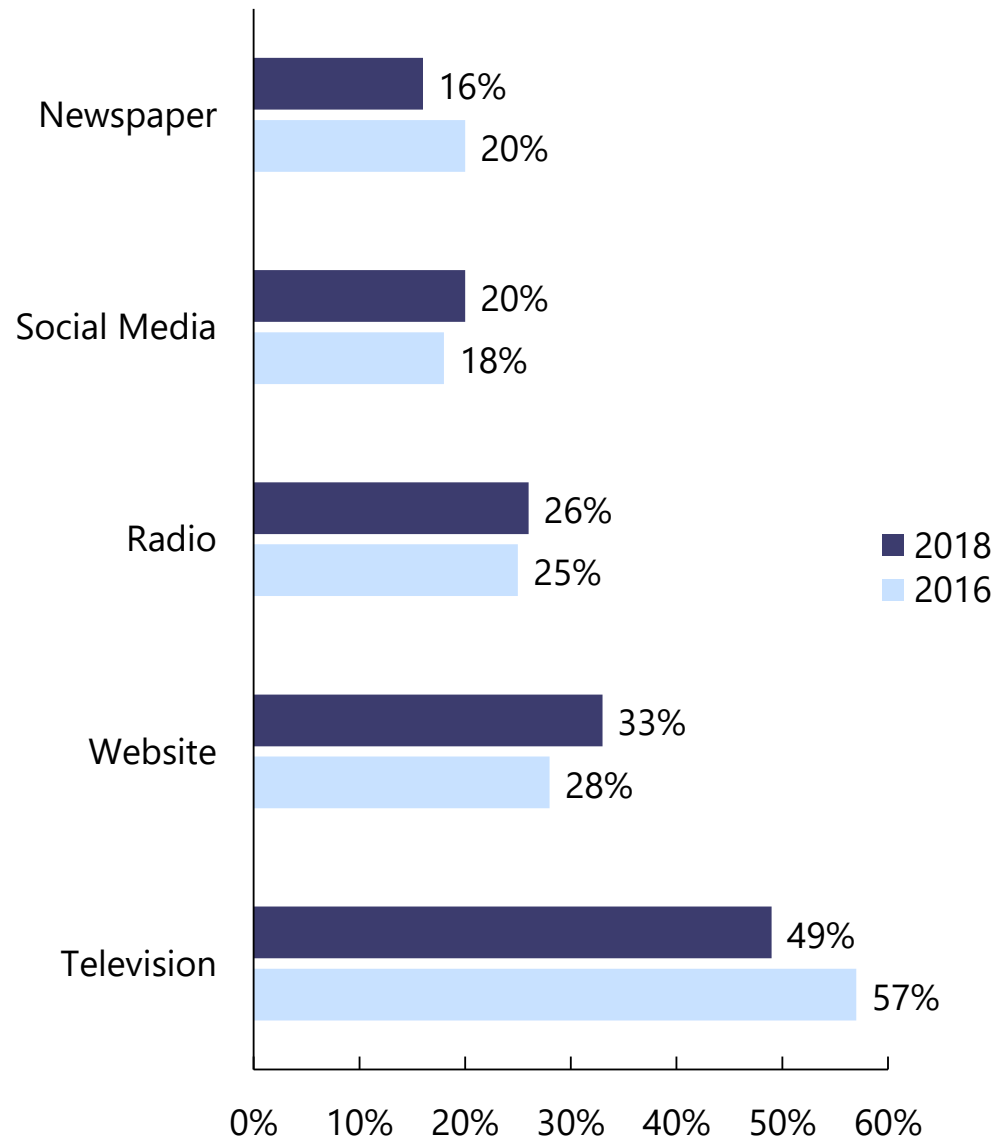


## Fig. 7.7 PCRI model of influencer management



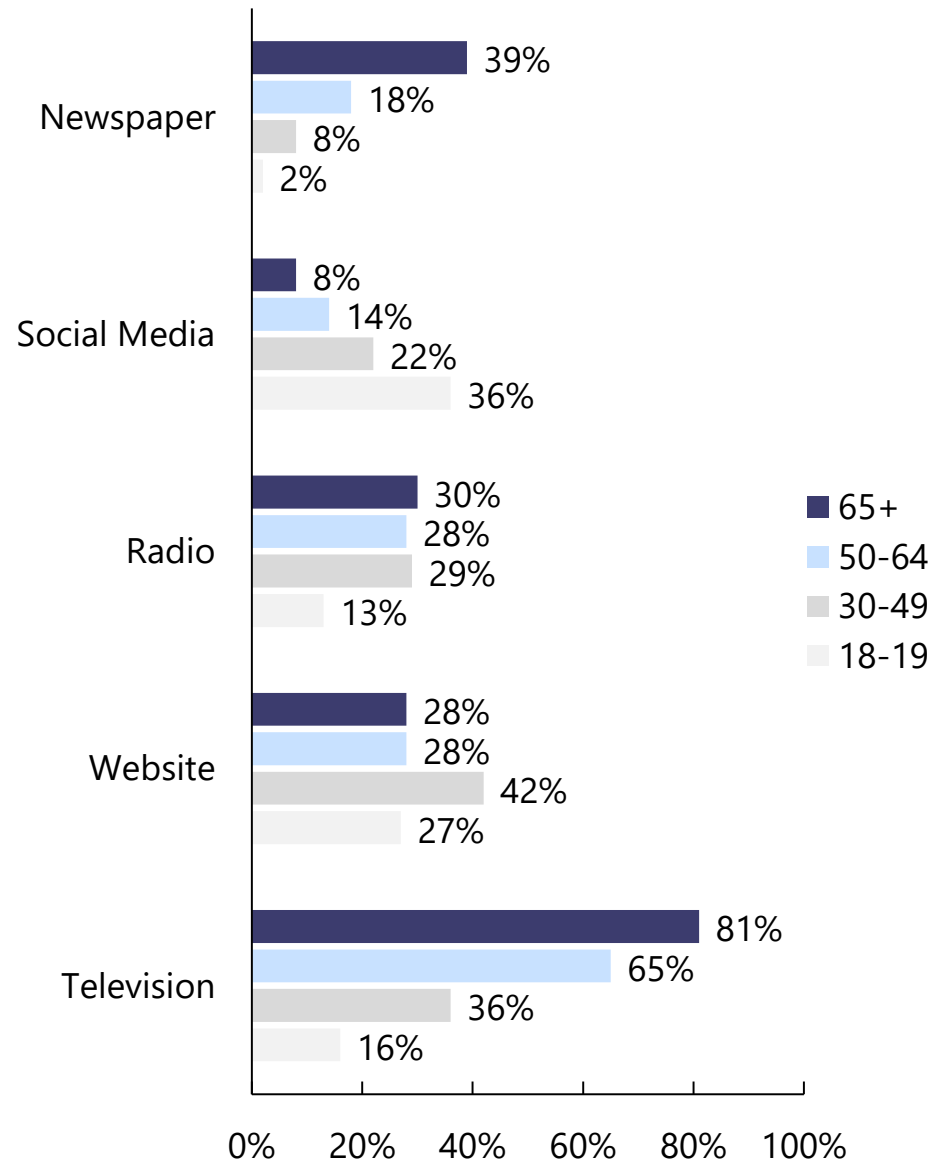
Source: Wirtz (2020b, 2021b, 2022)

**Fig. 7.8 Regularly used news sources in the United States**

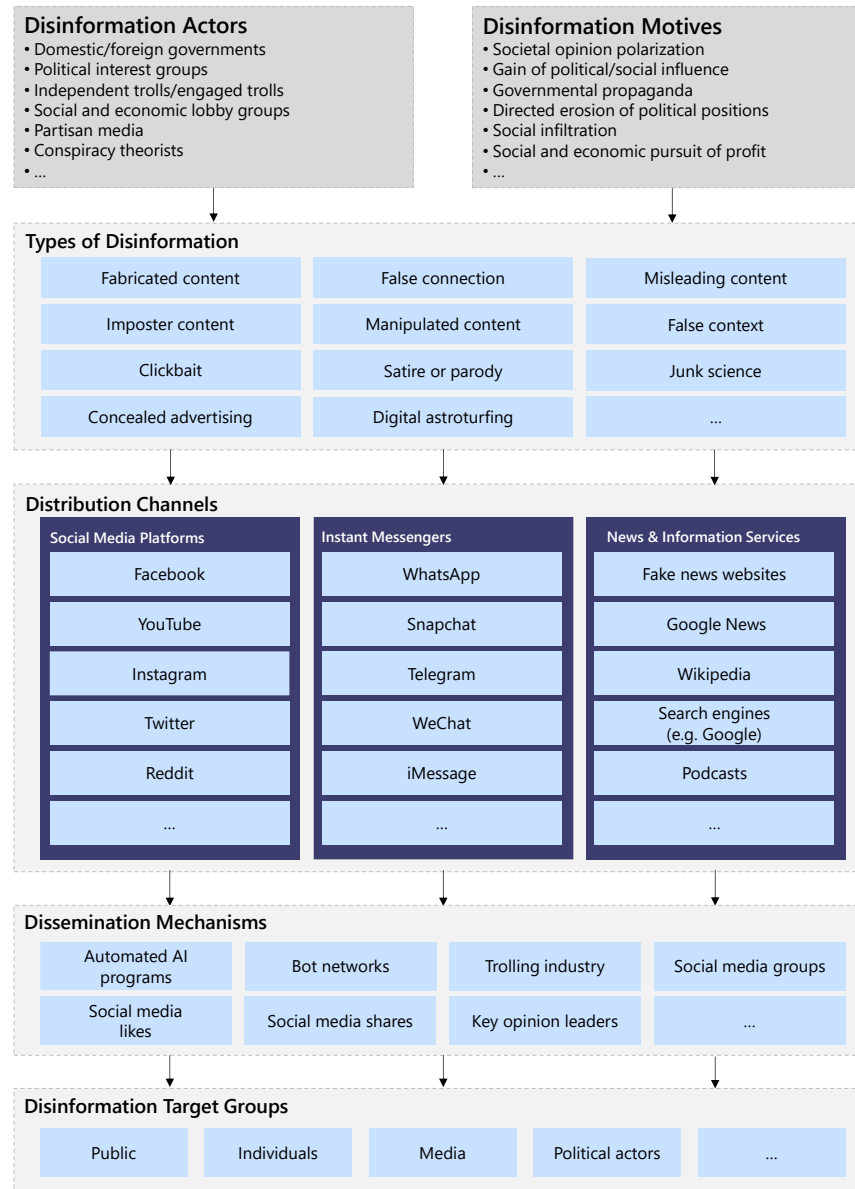


Data Source: Pew Research Center (2018), Wirtz (2021b, 2022)

**Fig. 7.9 Most often used news sources by age in the United States**



# Fig. 7.10 Integrated model of digital disinformation



Source: Wirtz (2020b, 2021b, 2022)

## Table 7.5 Governance of digital disinformation

	Social Measures	Organizational & Technological Measures	Public & Legal Measures
Disinformation Actors and Motives	<ul style="list-style-type: none"> <li>• Monitoring Disinformation</li> </ul>	<ul style="list-style-type: none"> <li>• (Crowd-based) source ratings</li> </ul>	<ul style="list-style-type: none"> <li>• State sanctions</li> </ul>
Disinformation Types	<ul style="list-style-type: none"> <li>• Independent fact-checking organizations and websites</li> </ul>	<ul style="list-style-type: none"> <li>• Human-curated algorithmic fact-checking</li> <li>• (Crowd-based) reporting tools</li> <li>• Inverse image search</li> </ul>	<ul style="list-style-type: none"> <li>• Gatekeeping</li> <li>• Certifications</li> <li>• Indexing</li> </ul>
Distribution Channels	<p>Self-regulation:</p> <ul style="list-style-type: none"> <li>• Standards and Guidelines</li> <li>• Voluntary self-regulation authorities</li> </ul>	<ul style="list-style-type: none"> <li>• Internal standards and guidelines</li> <li>• Digital Disinformation Officer (DDO)</li> <li>• Rethinking business models</li> <li>• Revised technological infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Fact-checking requirements</li> <li>• Requirement of verified standards and guidelines</li> </ul>
Dissemination Mechanisms	<p>Education:</p> <ul style="list-style-type: none"> <li>• Source criticism</li> <li>• Media literacy</li> <li>• Media effects</li> </ul>	<ul style="list-style-type: none"> <li>• Social media alerts</li> </ul>	<ul style="list-style-type: none"> <li>• Ban of trolling industry and dissemination bots</li> <li>• Ban of purchased social media interaction</li> </ul>
Disinformation Targets	<p>Communication:</p> <ul style="list-style-type: none"> <li>• Agenda-setting</li> <li>• Corrections</li> <li>• Framing</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing</li> <li>• Fact-checking app</li> <li>• Reactive public relation strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Data protection and data security laws</li> </ul>

Source: Wirtz (2021b, 2022)

**Table 7.6 Communication and interaction potential of social media tools  
(organization perspective)**

	Social Networking	Interaction Orientation	Customization/ Personalization	User- Added Value	Business Potential
Social Networks e.g., facebook.com	4	4	3	4	4
Weblogs e.g., blogger.com	1	2	2	2	2
Microblogs e.g., twitter.com	1	3	2	2	2
File Exchange & Sharing e.g., youtube.com	1	1	2	2	1
Rating Portals e.g., yelp.com	1	2	2	1	2
Instant Messengers e.g., whatsapp.com	4	4	2	1	2
Podcasts e.g., podcasts.com	1	1	2	1	1
Mashups e.g., parkingcarma.com	1	1	2	3	2
Wikis e.g., wikipedia.com	1	1	2	4	2
Social Tagging & Bookmarking e.g. delicious.com	1	1	1	4	1
Online Forums e.g., topix.com	4	4	2	4	3

Legend: 0 = No Potential 4 = Very High Potential

# Chapter 7

## Review questions, topics for discussion and online exercises

### Chapter 7

#### Review questions, topics for discussion and online exercises



##### Review questions

1. What is social media? Describe the difference between social media and Web 2.0.
2. Describe the Social Media Four Factors Model.
3. Explain the applications of social media with their respective service offerings and user benefits.
4. Describe the Digital Disinformation Model.
5. Describe the different governance mechanisms for the integrated Digital Disinformation Model.



##### Topics for classroom discussion and team debates

1. Discuss the effects of social media on the democratic understanding of open societies.
2. Discuss the advantages and disadvantages of social media for your personal use of the Internet and their effects on your social and leisure time behavior. Are social media really making the world a better place?
3. Discuss the dangers of fake news in social media. What social dangers arise from fake news and how can they be countered?



##### Online Exercises

1. Visit <https://digital-strategy.ec.europa.eu/en/policies/online-disinformation> and work out from this and the following pages how the European Commission is dealing with fake news.
2. Enter [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/930167/Social\\_Media\\_Acceptable\\_Use\\_Policy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/930167/Social_Media_Acceptable_Use_Policy.pdf) and elaborate on key elements of the social media acceptable use policy of the British government.
3. Visit <https://www.commerce.gov/about/policies/social-media> and identify the key cornerstones of the U.S. Department of Commerce's social media and web 2.0 policy.

# **Chapter 8: Smart City**



## Table 8.1 Smart city definitions

Author(s)	Definition
<b>Dameri (2013)</b>	A smart city is a well defined geographical area, in which high technologies such as ICT, logistic, energy production, and so on, cooperate to create benefits for citizens in terms of well being, inclusion and participation, environmental quality, intelligent development; it is governed by a well defined pool of subjects, able to state the rules and policy for the city government and development.
<b>Caragliu et al. (2009)</b>	We believe a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.
<b>Anthopoulos (2017c)</b>	[...] the utilization of ICT and innovation by cities (new, existing or districts), as a means to sustain in economic, social and environmental terms and to address several challenges dealing with six (6) dimensions (people, economy, governance, mobility, environment and living).
<b>Monzon (2015)</b>	A Smart City is an integrated system in which human and social capital interact, using technology-based solutions. It aims to efficiently achieve sustainable and resilient development and a high quality of life on the basis of a multistakeholder, municipality based partnership.

Source: Wirtz (2022)

# Definition of Smart City

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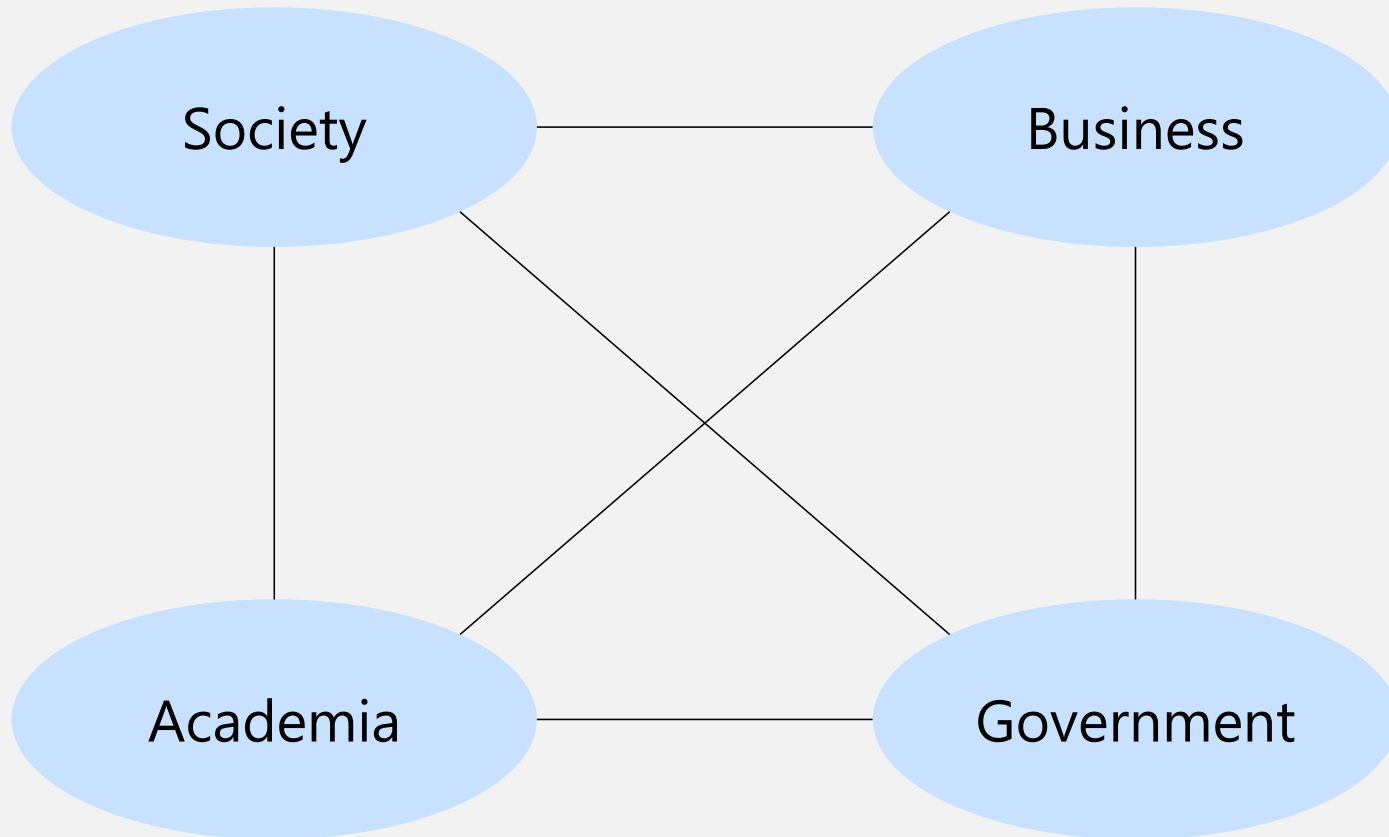
A smart city is an integrated system based on digital information technologies that focuses on improving the well-being of society through efficient and effective use of resources in an urban context. In particular, it is about meeting key stakeholder requirements through transparency, participation and collaboration.

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[Source: Wirtz \(2022\)](#)

**Fig. 8.1 The Four Spheres of the Quadruple Helix**

## Relevance of Smart City in the Quadruple Helix



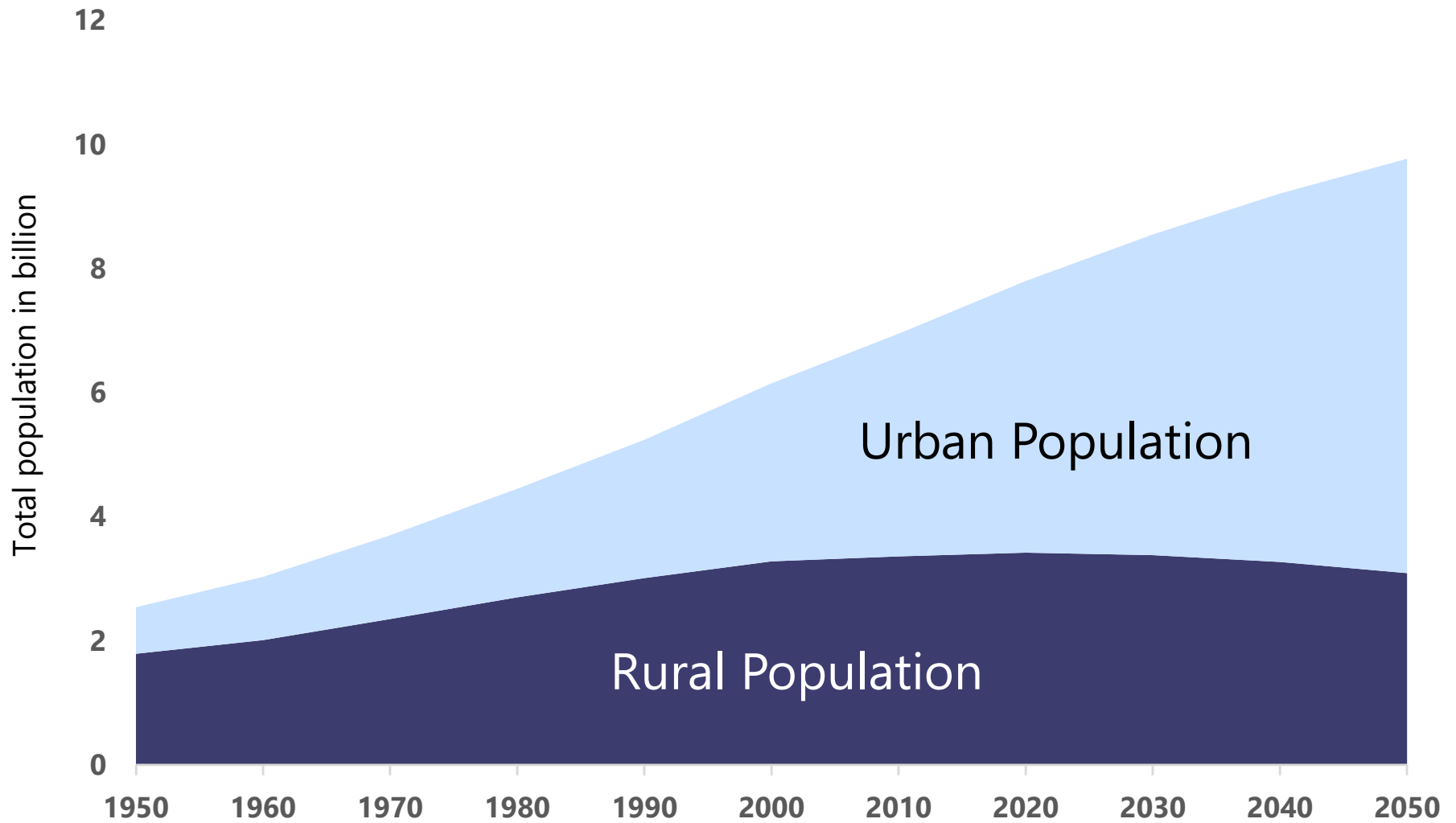
Source: Wirtz (2022)

## Table 8.2 Market value smart city investments

Year	Global Smart City Market in billion USD
2018	737
2019	858
2020	1.007
2021	1.194
2022	1.428
2023	1.721
2024	2.094
2025	2.577

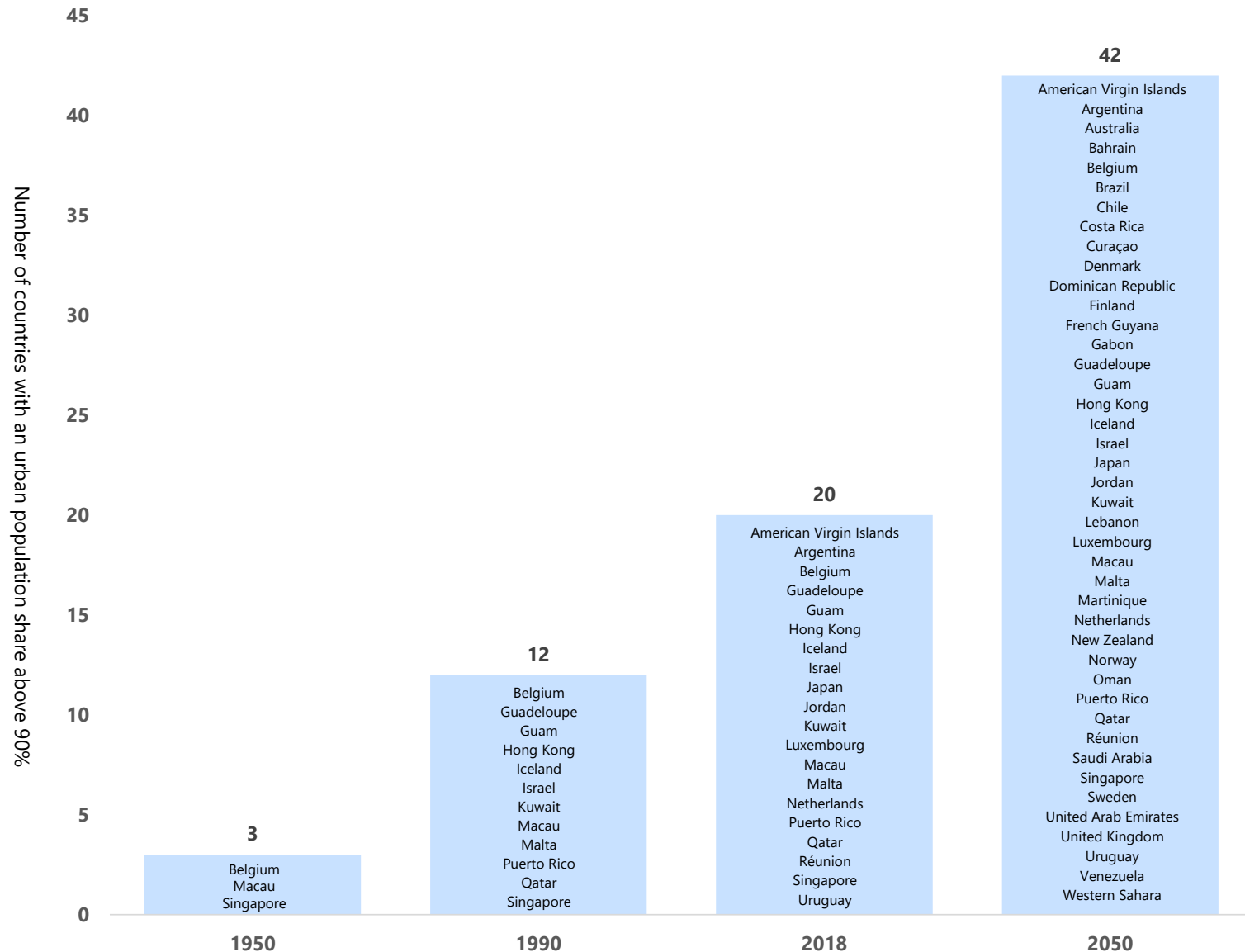
Data Source: PwC (2019), Wirtz (2022)

**Fig. 8.2 Growth and ratio of urban to rural population**



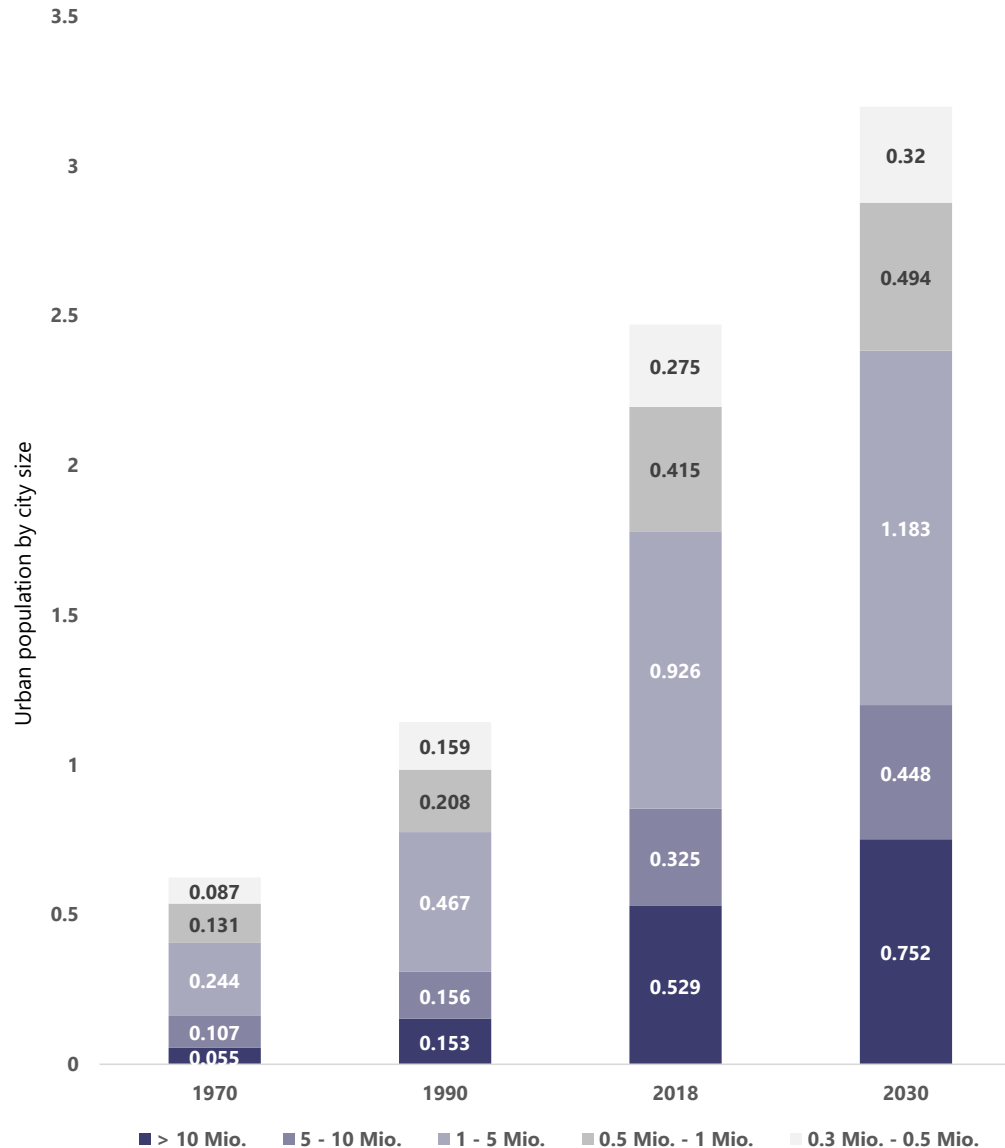
Data Source: United Nations (2019), Wirtz (2022)

**Fig. 8.3 Development of the number of countries with an urban population above 90%**



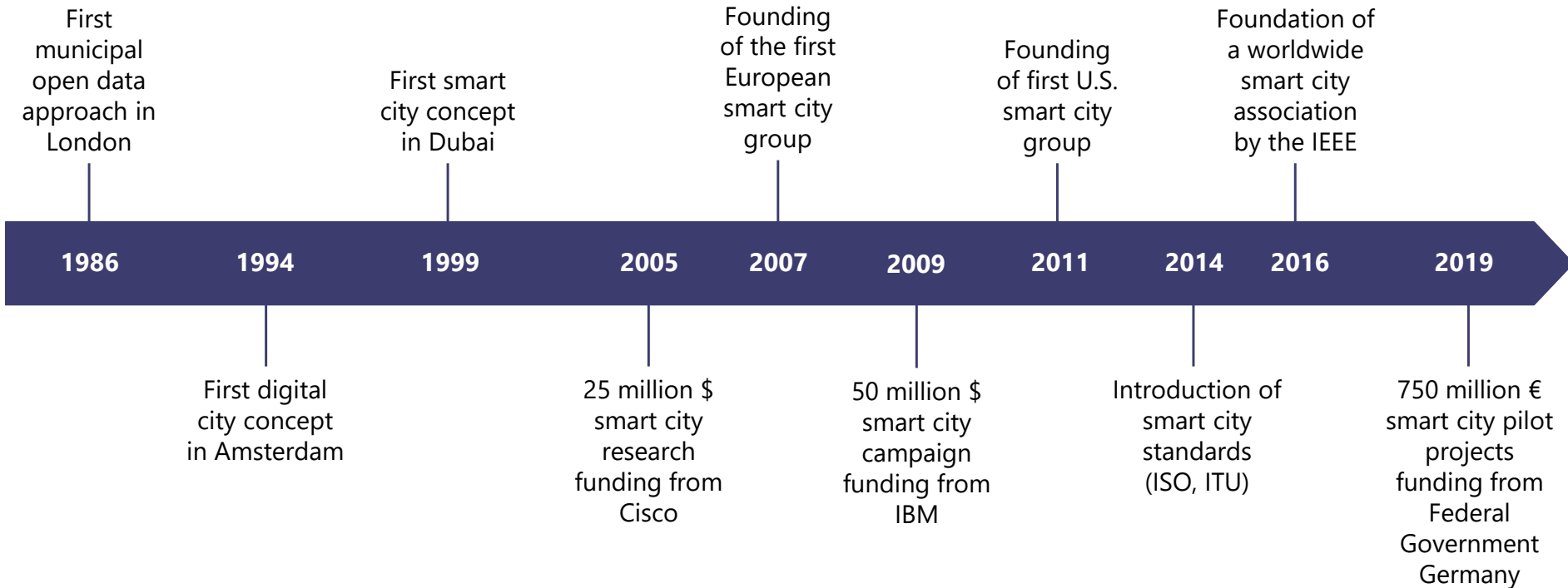
Data Source: United Nations (2019), Wirtz (2022)

## Fig. 8.4 Development of the global urban population based on respective size clusters



Data Source: United Nations (2019), Wirtz (2022)

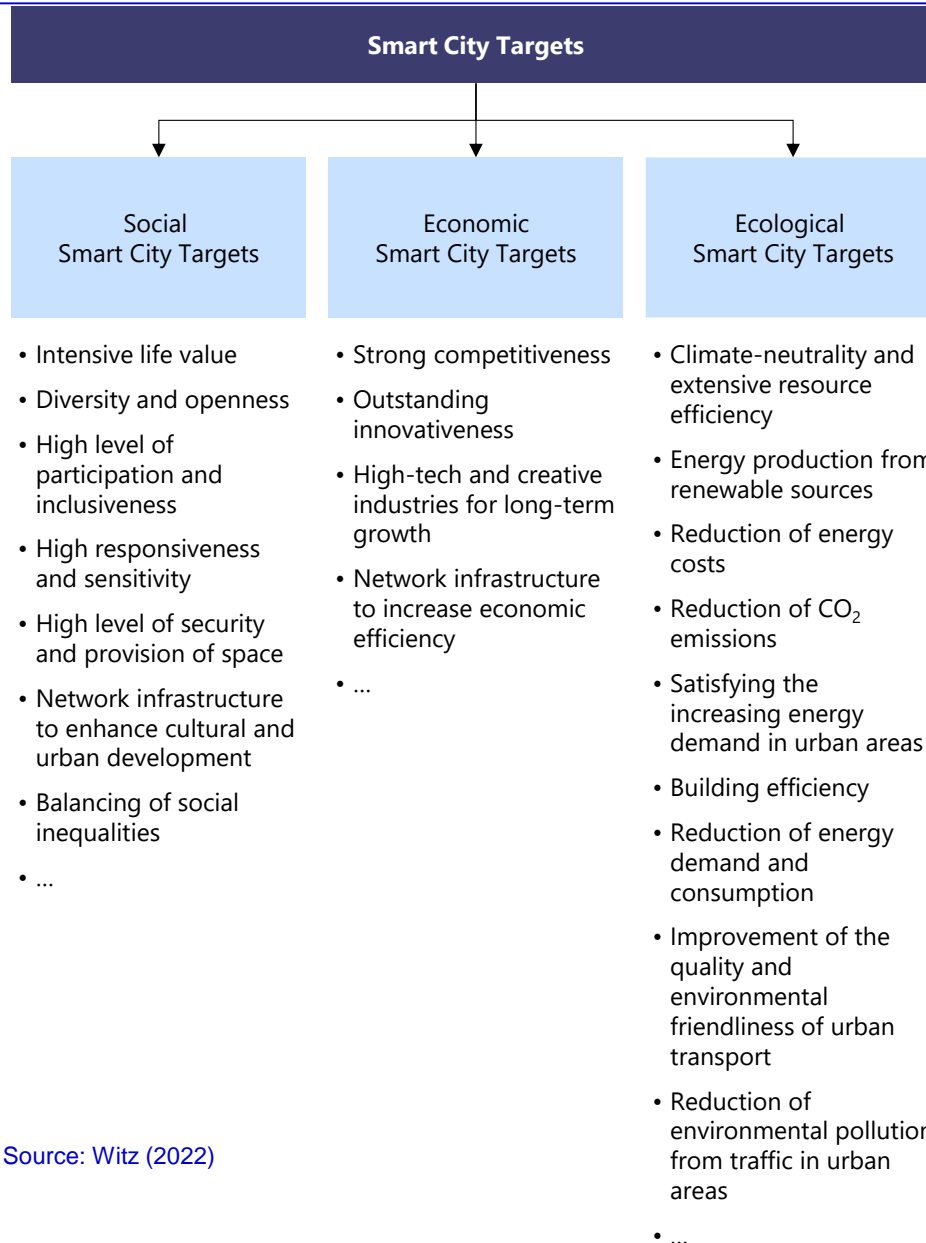
## Fig. 8.5 Development of the smart city concept



Data Source: Shields (2016), Anthopoulos (2017a), Bundesministerium des Innern und für Heimat (2019), GlobalData Thematic Research (2020), Witz (2022)



## Fig. 8.6 Three target dimensions of a smart city



Source: Witz (2022)

## Table 8.3 Potential for improvements through smart public services

Domain	Improvement through smart services
Smart Governance & E-Governance	<ul style="list-style-type: none"> <li>• Increase of the residents' sense of connection to their city by up to 15%</li> <li>• Increase of the residents' sense of connection to their city administration by up to 25%</li> <li>• Reduce the unemployment rate by 1% - 3%</li> <li>• Reduce the communication time with administrations by 45% - 65%</li> <li>• ...</li> </ul>
Smart Social Services	<ul style="list-style-type: none"> <li>• Reduction of the disease burden by 8% - 15%</li> <li>• Reduce citizen spending by 1% - 3%</li> <li>• Decrease in emergency response time by 20% - 35%</li> <li>• Reduce crime rate by 30% - 40%</li> <li>• Reduce deaths by 8% - 10%</li> <li>• Reduce health care communication time by 45% - 65%</li> <li>• ...</li> </ul>
Smart Resources & Smart Environment	<ul style="list-style-type: none"> <li>• Reduce greenhouse gas emissions by 10% - 15%</li> <li>• Reduce water consumption by 20% - 30%</li> <li>• Reduce non-recyclable waste by 10% - 20%</li> <li>• ...</li> </ul>
Smart Mobility & Smart Infrastructure	<ul style="list-style-type: none"> <li>• Reduce travel times by 15% - 20%</li> <li>• ...</li> </ul>

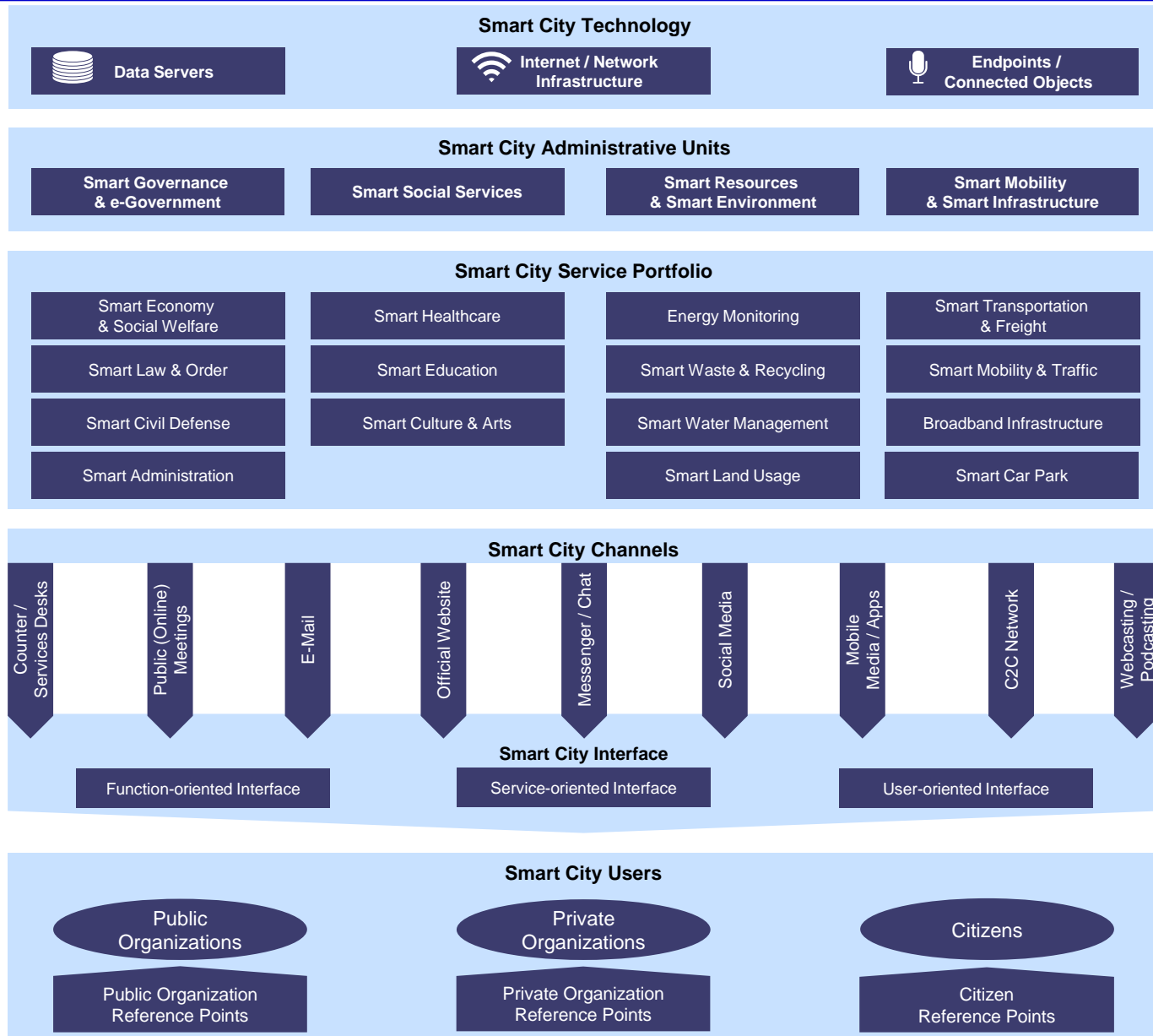
Data Source: KcKinsey & Organization (2018), Witz (2022)

## Table 8.4 Smart City Ranking

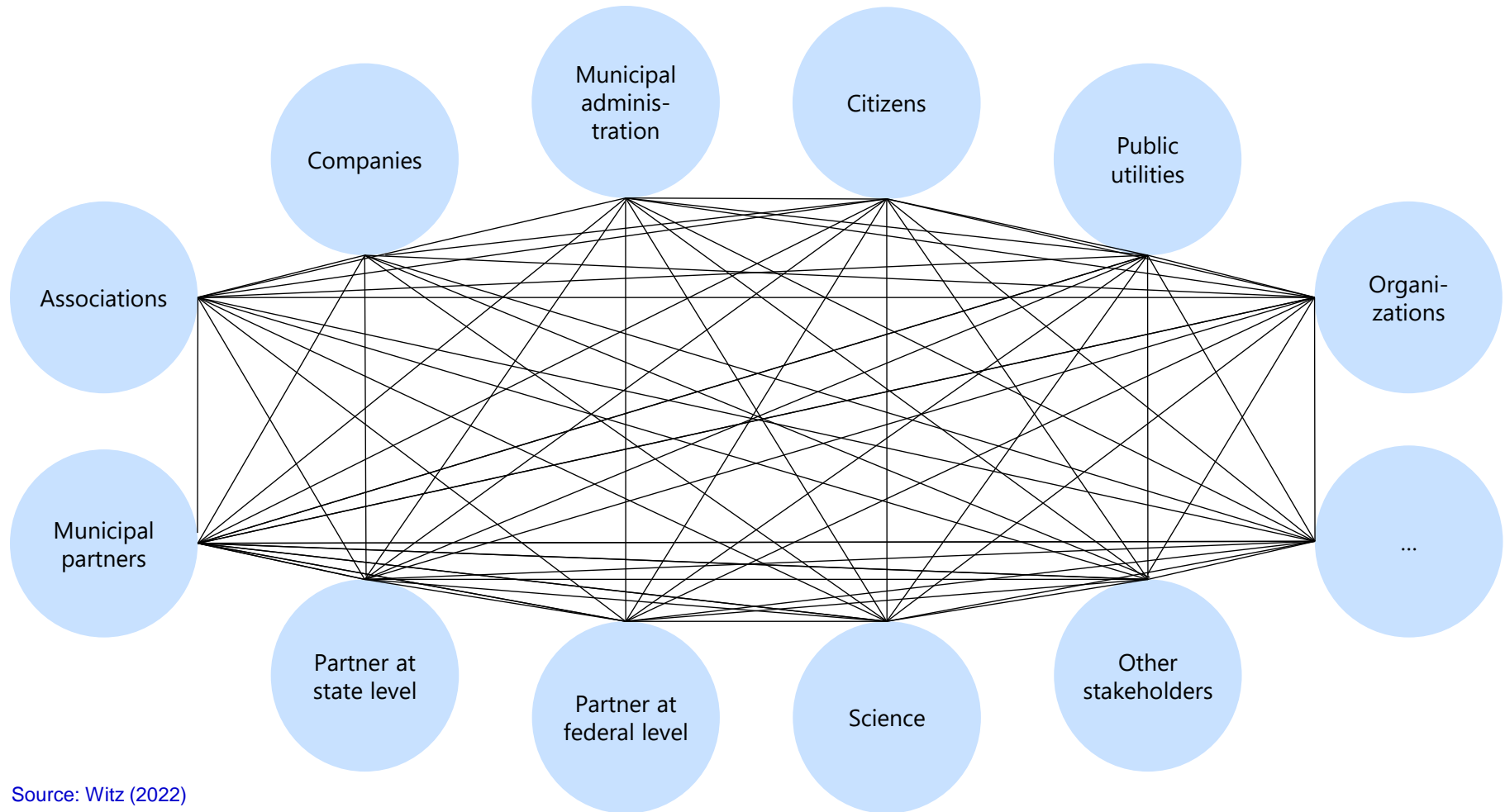
Rank	City
1	Singapore
2	Helsinki
3	Zurich
4	Auckland
5	Oslo
6	Copenhagen
7	Geneva
8	Taipei
9	Amsterdam
10	New York

Data Source: Institute for Management Development (2020), Witz (2022)

# Fig. 8.7 Smart City Service Provision Framework

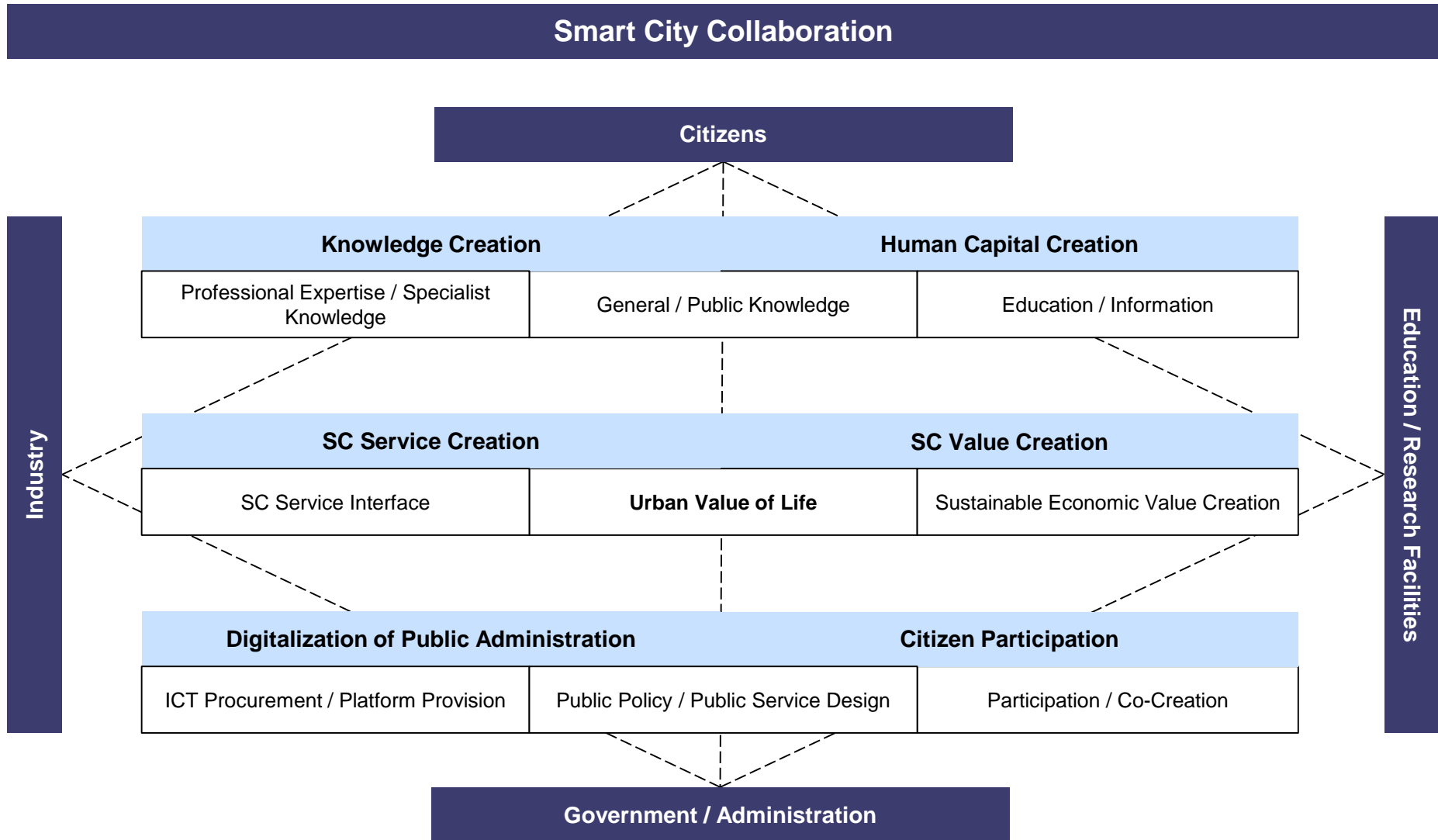


## Fig. 8.8 Smart City Stakeholder Network



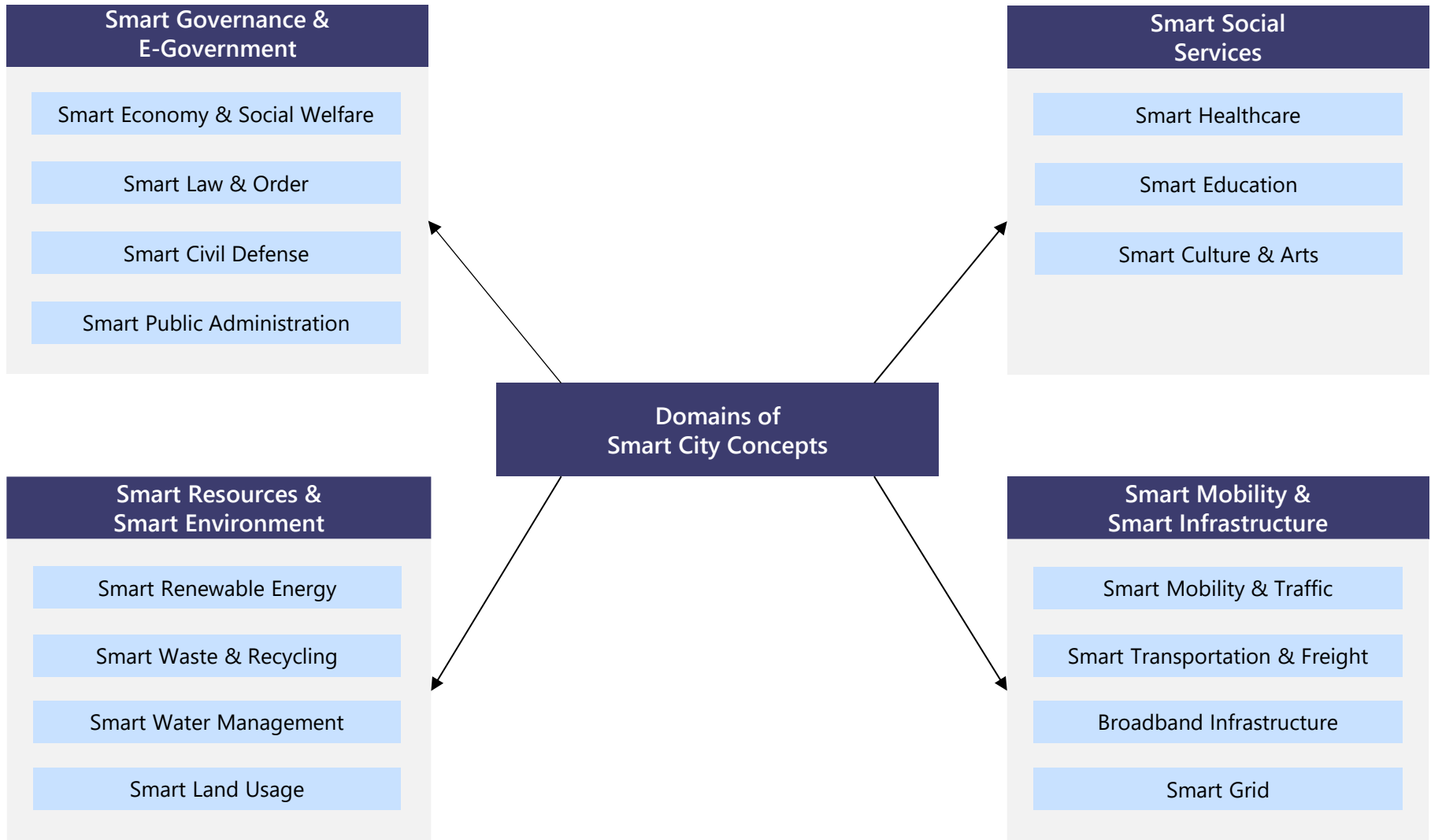
Source: Witz (2022)

# Fig. 8.9 Smart City Collaboration Model



Source: Witz (2022)

**Fig. 8.10 Stakeholder domains of smart city concepts**



Source: Witz (2022)

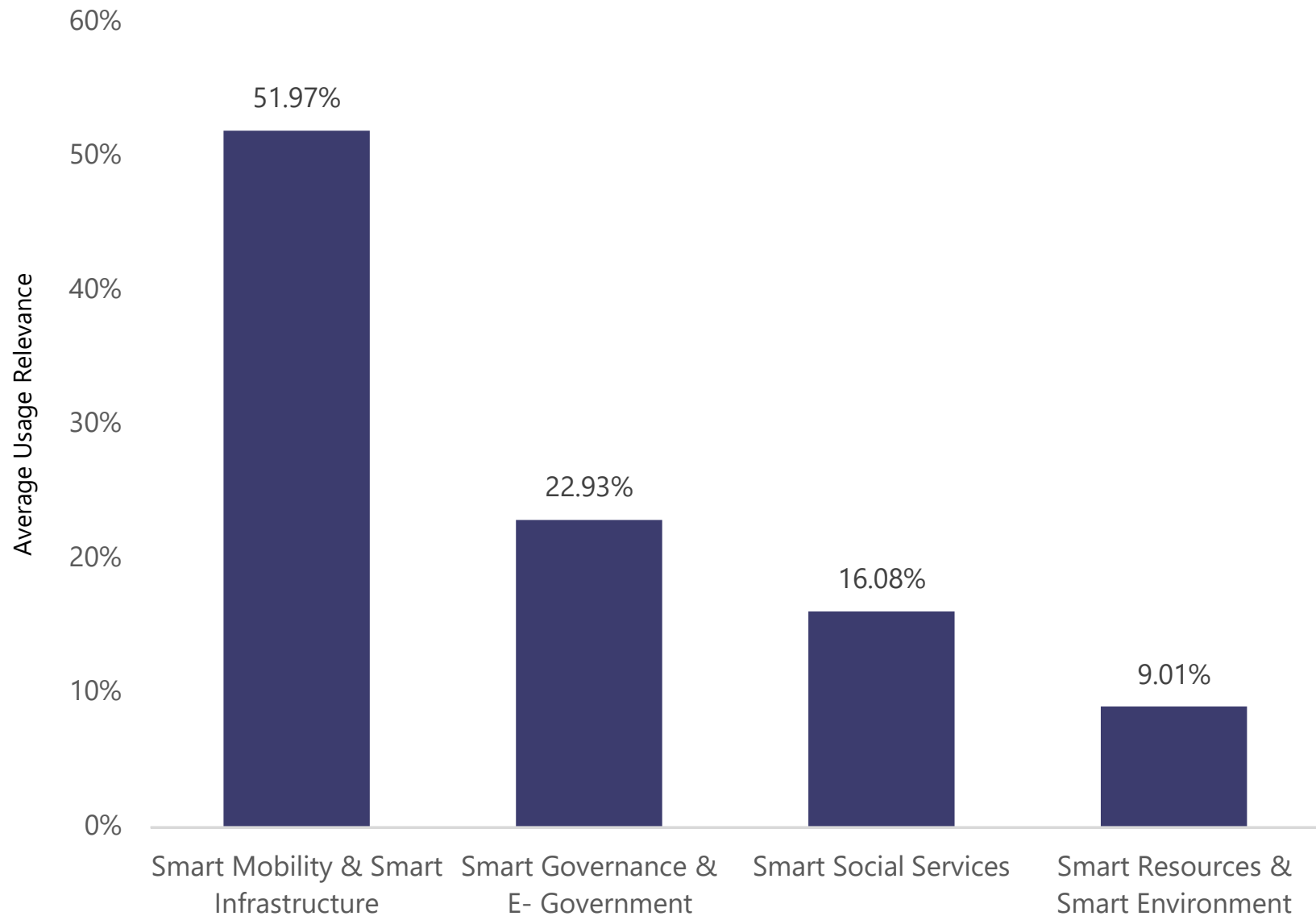
# Fig. 8.11 Smart City Service Portfolio

Smart City Service Portfolio			
Smart Governance & E-Government	Smart Social Services	Smart Resources & Smart Environment	Smart Mobility & Smart Infrastructure
<p><b>Public Safety Law and Order</b></p> <ul style="list-style-type: none"> <li>• Civil protection services</li> <li>• Disaster warning app</li> <li>• Emergency detection systems</li> <li>• Epidemic plague detection systems</li> <li>• Fire monitoring/detection systems</li> <li>• Law and order services</li> <li>• Crime monitoring/detection systems</li> <li>• Urban surveillance system</li> <li>• Open Source Standards</li> <li>• Smart City Operations Center</li> <li>• ...</li> </ul>	<p><b>Smart Healthcare</b></p> <ul style="list-style-type: none"> <li>• Electronic medical records</li> <li>• First aid apps</li> <li>• Medical services general info app (location, contact, specialist info, make an appointment, etc.)</li> <li>• Real-time health monitoring</li> <li>• Medical check reminder</li> <li>• Self-diagnosis/disease detection</li> <li>• Smart body meters</li> <li>• Vital sign monitoring</li> <li>• Remote nursing systems for hospitals</li> <li>• Tele-medicine</li> <li>• ...</li> </ul>	<p><b>Smart Energy</b></p> <ul style="list-style-type: none"> <li>• Smart energy supply systems</li> <li>• Energy consumption monitoring</li> <li>• Energy efficiency monitoring</li> <li>• Micro grid / smart grids</li> <li>• Storage of surplus energy</li> <li>• Smart city lightning systems</li> <li>• Smart street lightning systems</li> <li>• ...</li> </ul>	<p><b>Smart Mobility / Smart Traffic / Parking</b></p> <ul style="list-style-type: none"> <li>• Bike sharing systems</li> <li>• Pedestrian navigation</li> <li>• Real-time fuel price information</li> <li>• Traffic Information System</li> <li>• Assisted driving / vehicle navigation</li> <li>• Parking information system</li> <li>• Parking navigation app</li> <li>• Traffic Management System</li> <li>• Real-time car census</li> <li>• Real-time traffic flow status</li> <li>• Real-time parking status</li> <li>• Traffic congestion control</li> <li>• Traffic Light Control Center</li> <li>• Vehicle classification &amp; identification</li> <li>• ...</li> </ul>
<p><b>Smart Governance</b></p> <ul style="list-style-type: none"> <li>• Crowd-sensing / crowdsourcing</li> <li>• E-government apps</li> <li>• Automated applications/queries</li> <li>• Appointment scheduling app</li> <li>• Civic information system</li> <li>• Civic reporting/feedback apps</li> <li>• E-payment system (taxes, fines, ...)</li> <li>• Electronic ID / Smart Card</li> <li>• Online citizen account/portal</li> <li>• Electronic public service delivery</li> <li>• Participation platforms for public debates and civic engagement</li> <li>• Private-public-partnership for public service provision</li> <li>• ...</li> </ul>	<p><b>Smart Education</b></p> <ul style="list-style-type: none"> <li>• Digital education and technical retraining</li> <li>• Public Online Libraries / Library apps</li> <li>• Remote education systems</li> <li>• Online campus/university apps</li> <li>• Online classroom/school apps</li> <li>• Tele-education</li> <li>• Skill development centers</li> <li>• ...</li> </ul>	<p><b>Smart Environment</b></p> <ul style="list-style-type: none"> <li>• Aqueduct/water utilization systems</li> <li>• Environmental monitoring system</li> <li>• Environmental protection programs</li> <li>• Quality and Pollution Meters</li> <li>• Air quality monitoring system</li> <li>• Environment impact meters</li> <li>• Real-time quality/pollution info app</li> <li>• Water quality monitoring system</li> <li>• Real-time weather / environmental data</li> <li>• Waste and Recycling Services</li> <li>• Recycling info app</li> <li>• Smart waste bins</li> <li>• Waste collection systems</li> <li>• Waste processing systems</li> <li>• Smart weather meters</li> <li>• ...</li> </ul>	<p><b>Smart Logistics / Smart Transport</b></p> <ul style="list-style-type: none"> <li>• Call-a-taxi-app</li> <li>• Delivery Tracking Check</li> <li>• Electric buses</li> <li>• Public Transit Information System</li> <li>• Bus routes information app</li> <li>• Combined e-ticket for urban transit</li> <li>• Delay information app</li> <li>• Electronic/mobile ticketing</li> <li>• Schedule information app</li> <li>• Shuttle service for special locations</li> <li>• Public Transit Management System</li> <li>• Delay management system</li> <li>• (Bus) route tracking system</li> <li>• Passenger counting system</li> <li>• Smart Loading/Unloading Areas</li> <li>• ...</li> </ul>
<p><b>Smart Economy</b></p> <ul style="list-style-type: none"> <li>• E-commerce apps</li> <li>• Banking apps</li> <li>• Price-checking apps</li> <li>• Knowledge economy and high-tech industry</li> <li>• Online job portals / job agency app</li> <li>• Smart industry systems</li> <li>• Industrial automation (Industry 4.0)</li> <li>• Industry support programs</li> <li>• Safety supervision systems</li> <li>• Trade Facilitation Centers</li> <li>• ...</li> </ul>	<p><b>Arts, Culture, Recreation and Tourism Services</b></p> <ul style="list-style-type: none"> <li>• Cultural Facility Management System</li> <li>• Digital applications for culture, tourism and recreation</li> <li>• Cultural Information App</li> <li>• Interactive city guide apps</li> <li>• Personal calendar for events in the city/area</li> <li>• ...</li> </ul>		<p><b>Smart Infrastructure</b></p> <ul style="list-style-type: none"> <li>• 5G network and connectivity services</li> <li>• Broadband/high speed internet</li> <li>• Building maintenance systems</li> <li>• Car charging infrastructure</li> <li>• Connected cars</li> <li>• Connected urban sensor system</li> <li>• Data Infrastructure</li> <li>• Data Management Systems</li> <li>• Municipal data analytics</li> <li>• Open APIs</li> <li>• Open data bases</li> <li>• Public data centers</li> <li>• Urban computer and server network</li> <li>• High-tech roads / connected cars</li> <li>• Public Wi-Fi infrastructure</li> <li>• Smart home networks</li> <li>• ...</li> </ul>
	<p><b>Smart People / Smart Community</b></p> <ul style="list-style-type: none"> <li>• Remote child care apps/services</li> <li>• Smart Home Management System</li> <li>• Urban social network apps</li> <li>• ...</li> </ul>		

Source: Witz (2022)

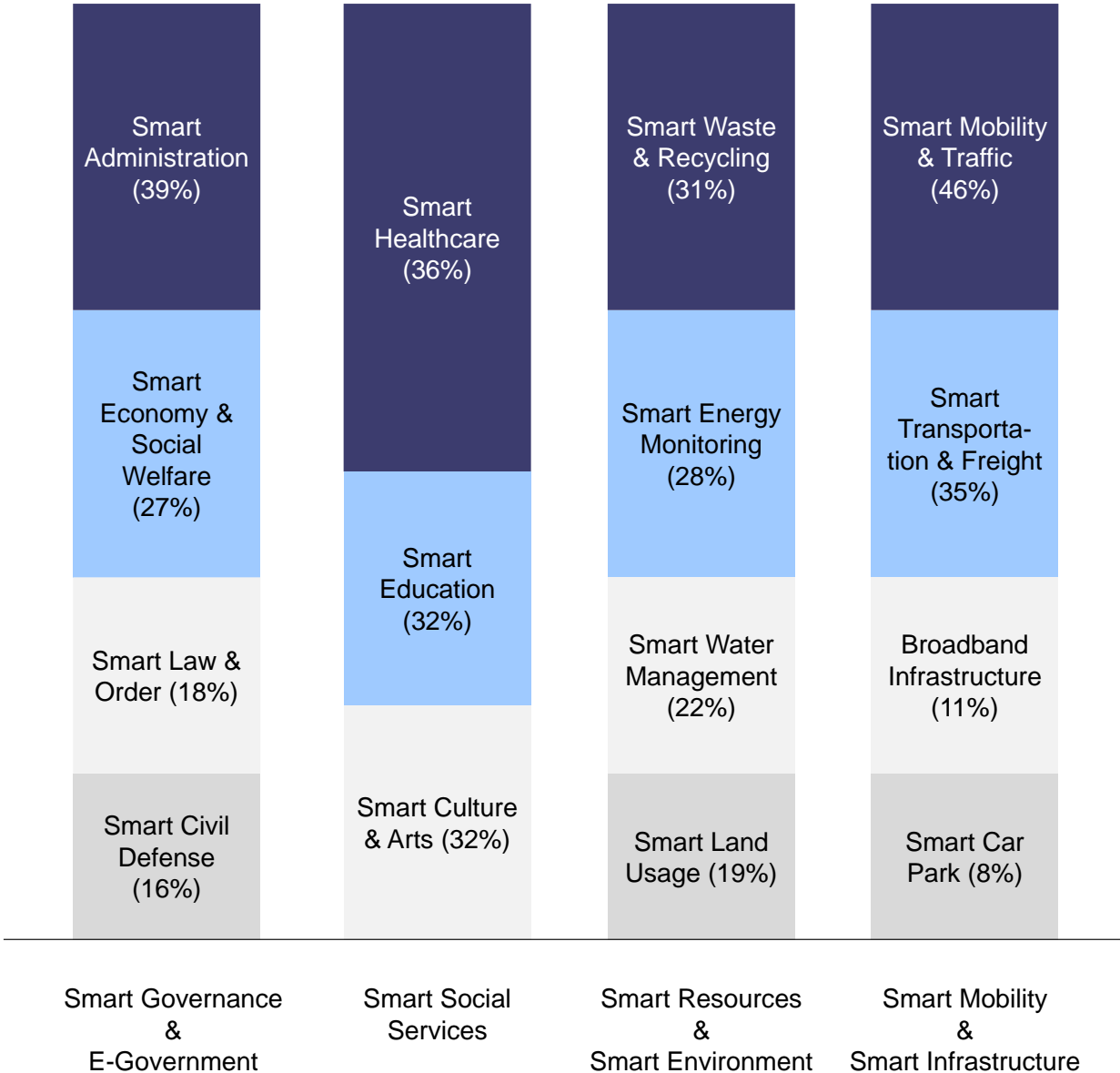


**Fig. 8.12 Lead users' preferences regarding smart city services**



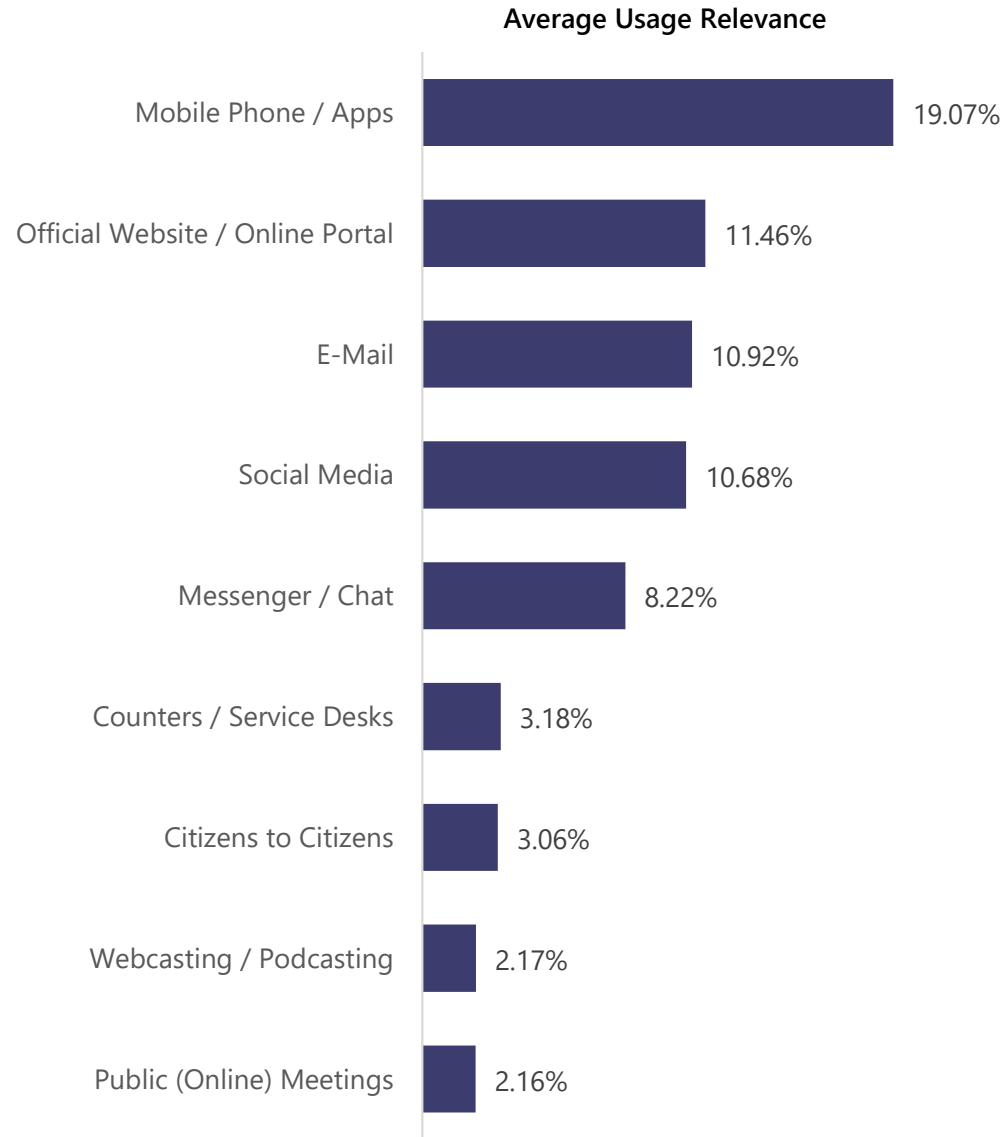
Data Source: Wirtz et al. (2021e), Witz (2022)

**Fig. 8.13 Participants' preferences for different smart city services domains**



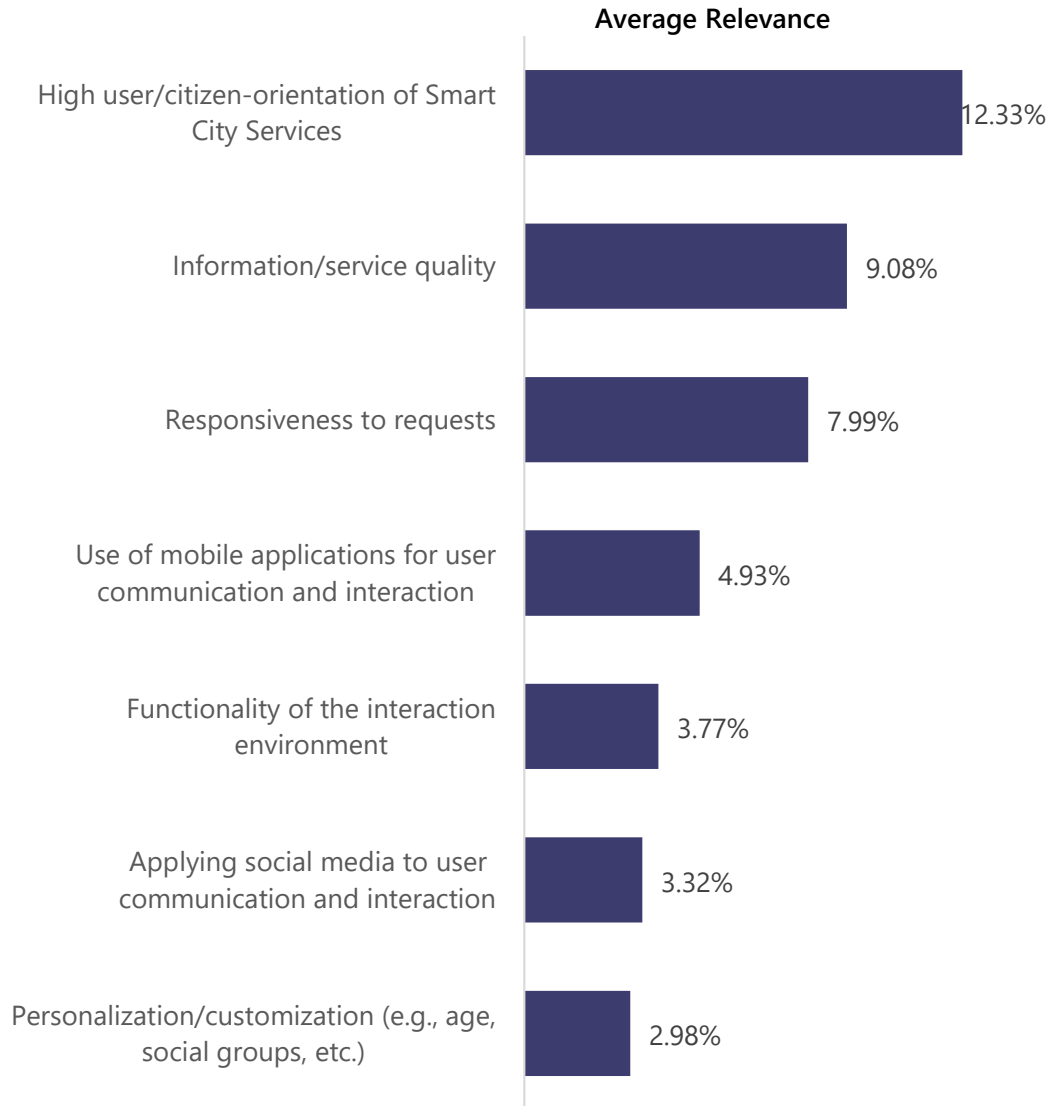
Source: Data Wirtz et al. (2021e), Wirtz (2022)

## Fig. 8.14 Preferences of smart city service channels



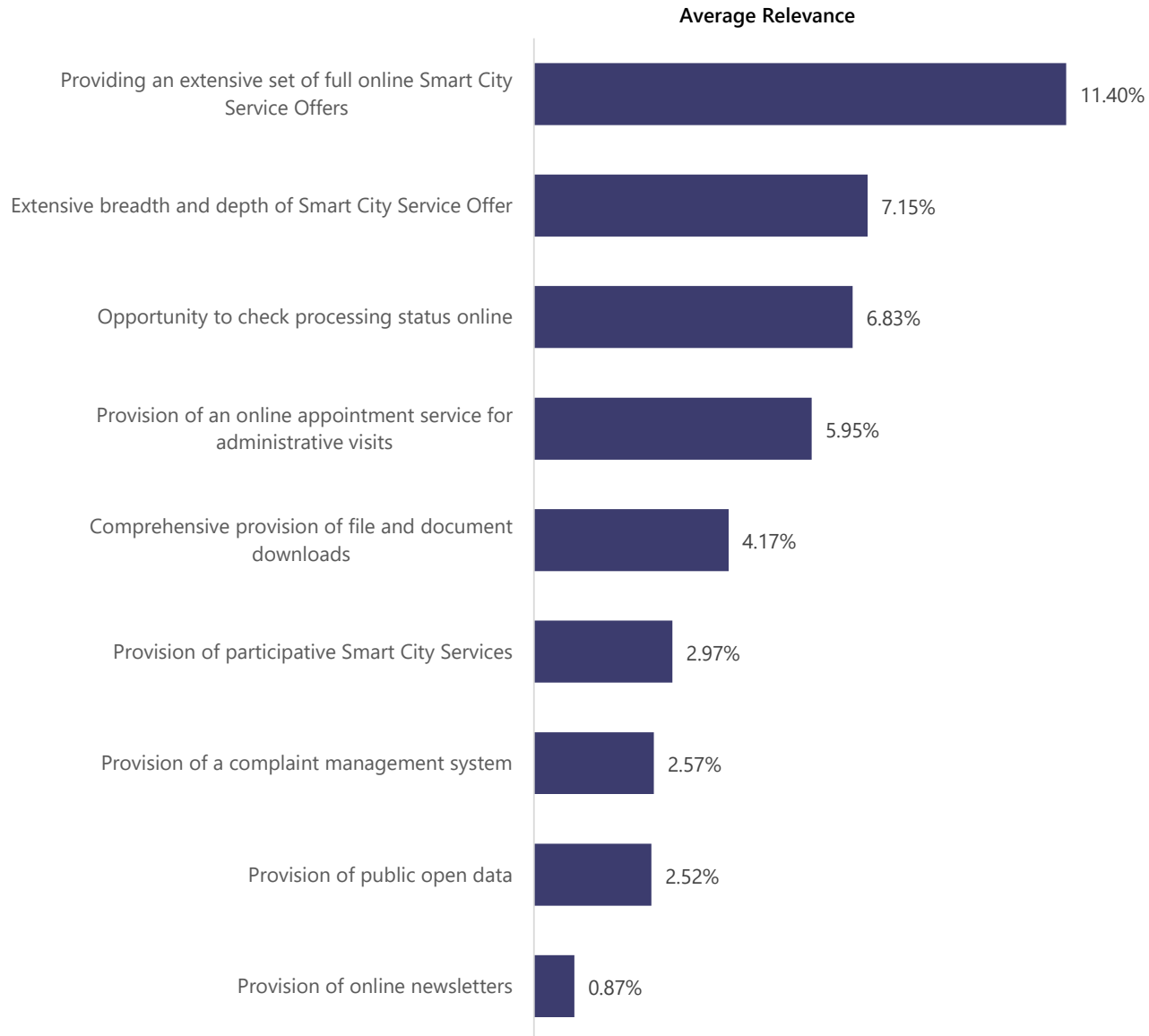
Data Source: Wirtz et al. (2021e), Witz (2022)

## Fig. 8.15 Functional user demands of smart cities



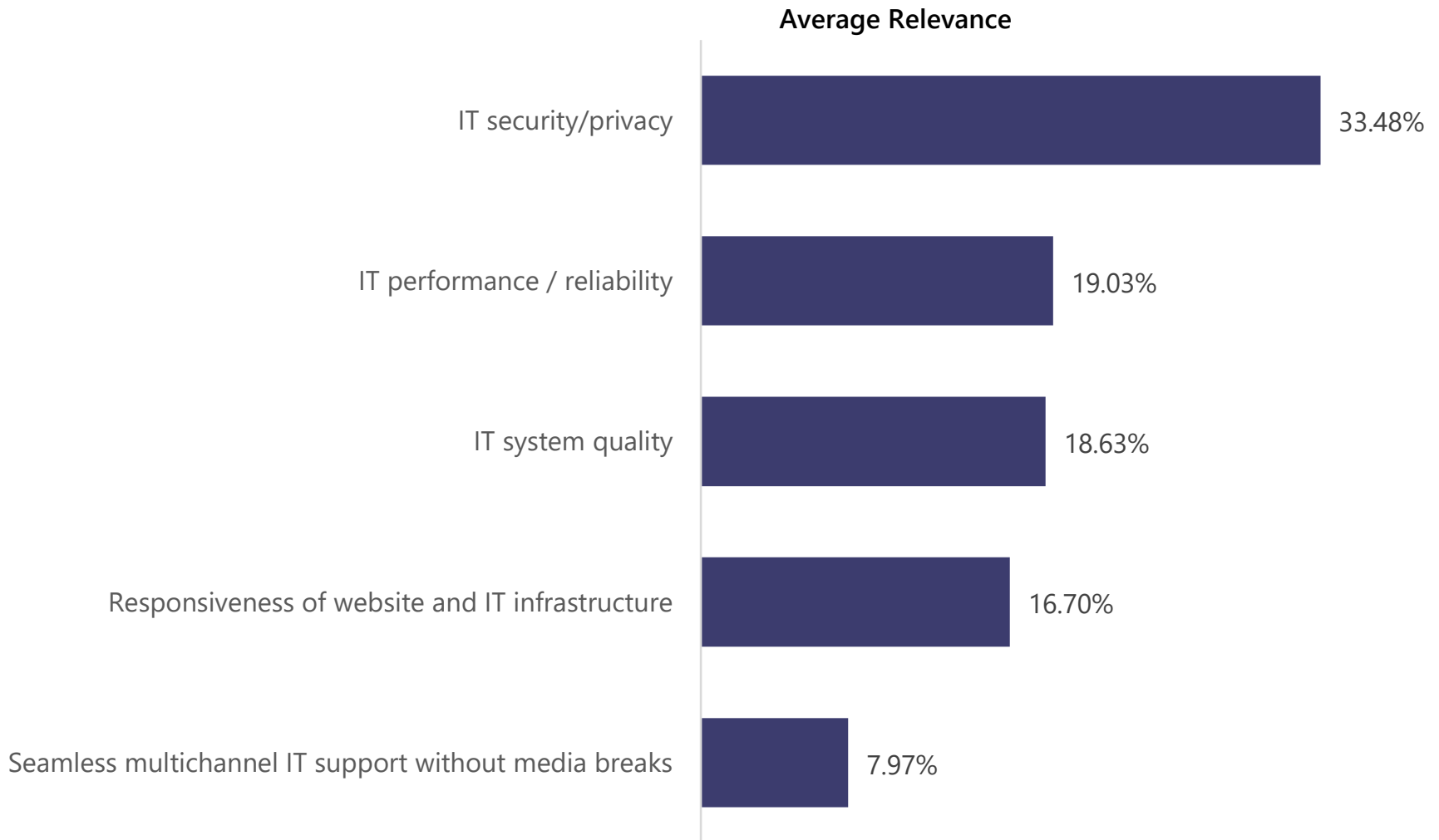
Data Source: Wirtz et al. (2021e), Witz (2022)

## Fig. 8.16 Smart city performance user demands



Data Source: Wirtz et al. (2021e), Witz (2022)

**Fig. 8.17 Smart city IT user demands**



Data Source: Wirtz et al. (2021e), Witz (2022)

# Definition of Smart City Ecosystem

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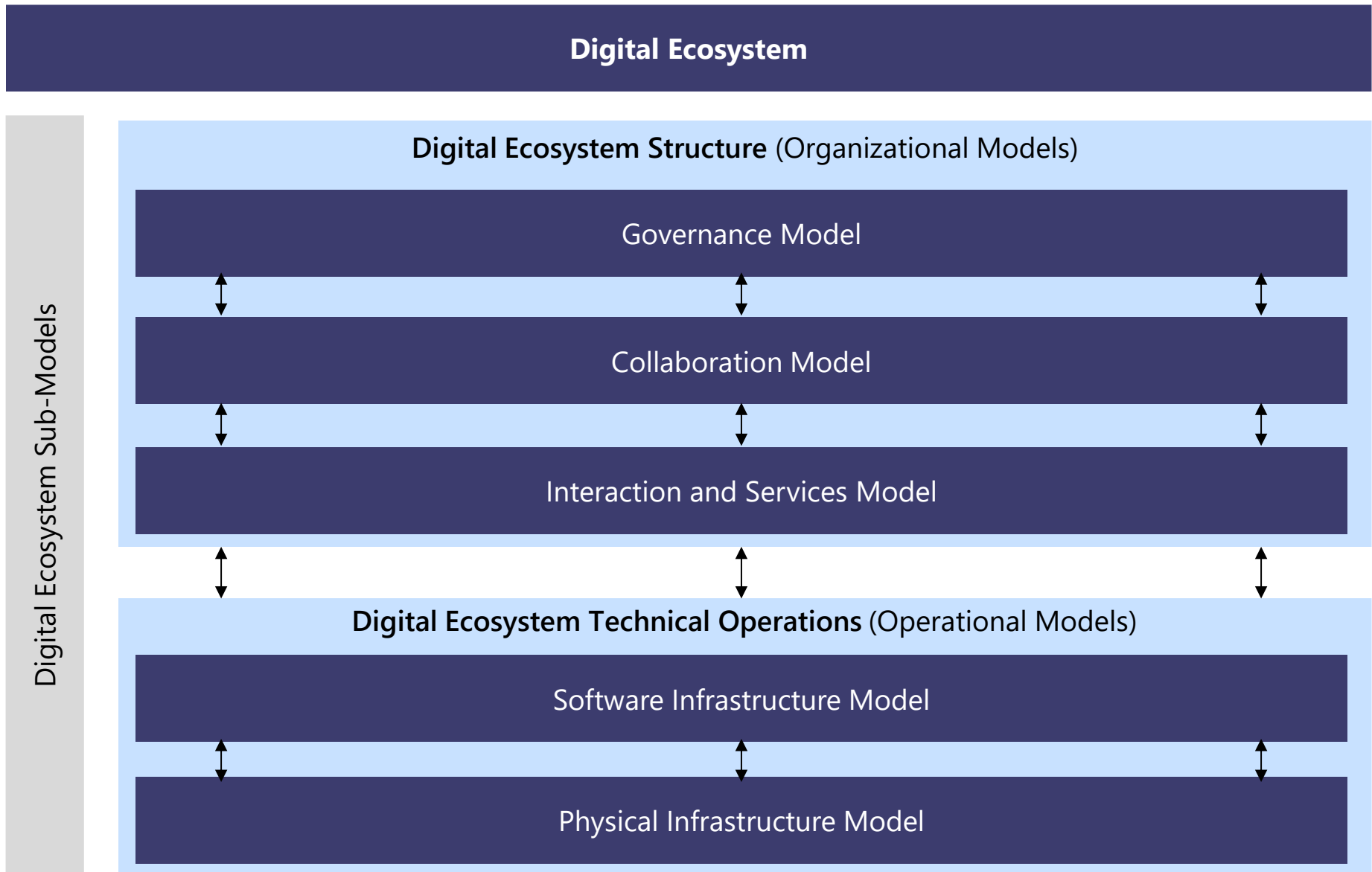
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A smart city ecosystem is an integrated framework of different actors, value chains and organizational relationships that represent all smart city activities leading to a dynamic and complex relationship network that collaboratively creates value.

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Source: Witz (2022)

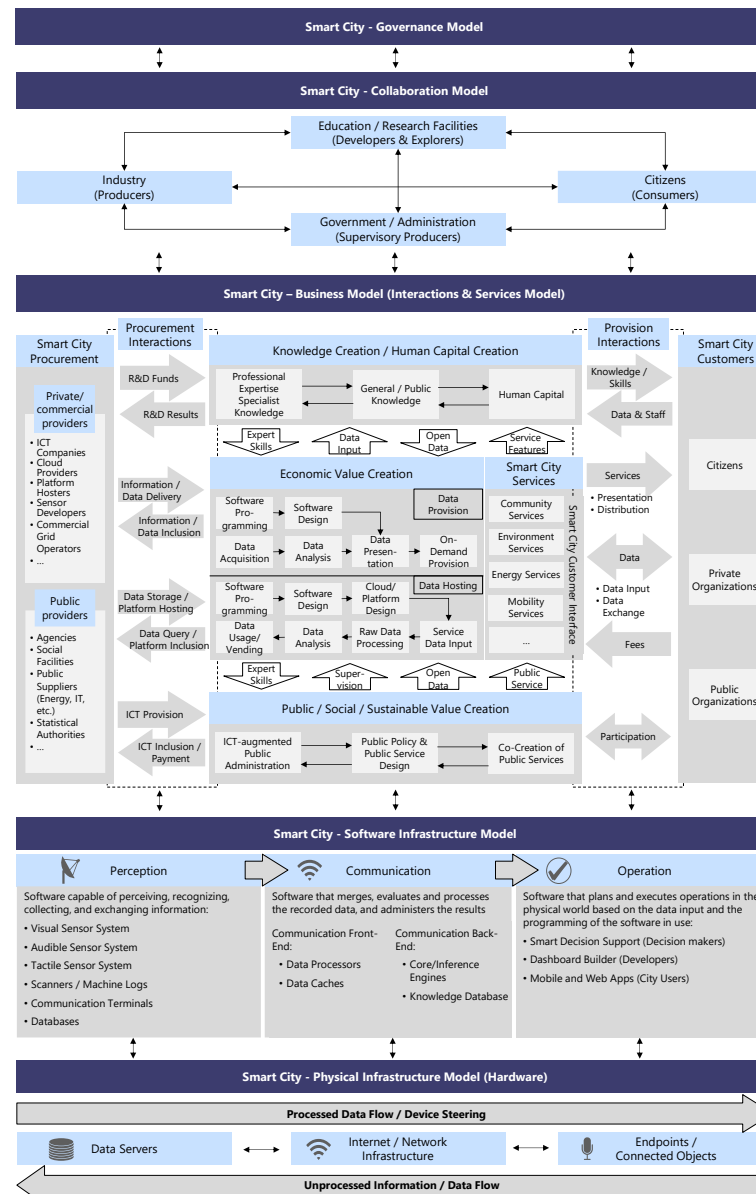
**Fig. 8.18 Sub-models of a digital ecosystem**



Source: Wirtz (2021b, 2022)

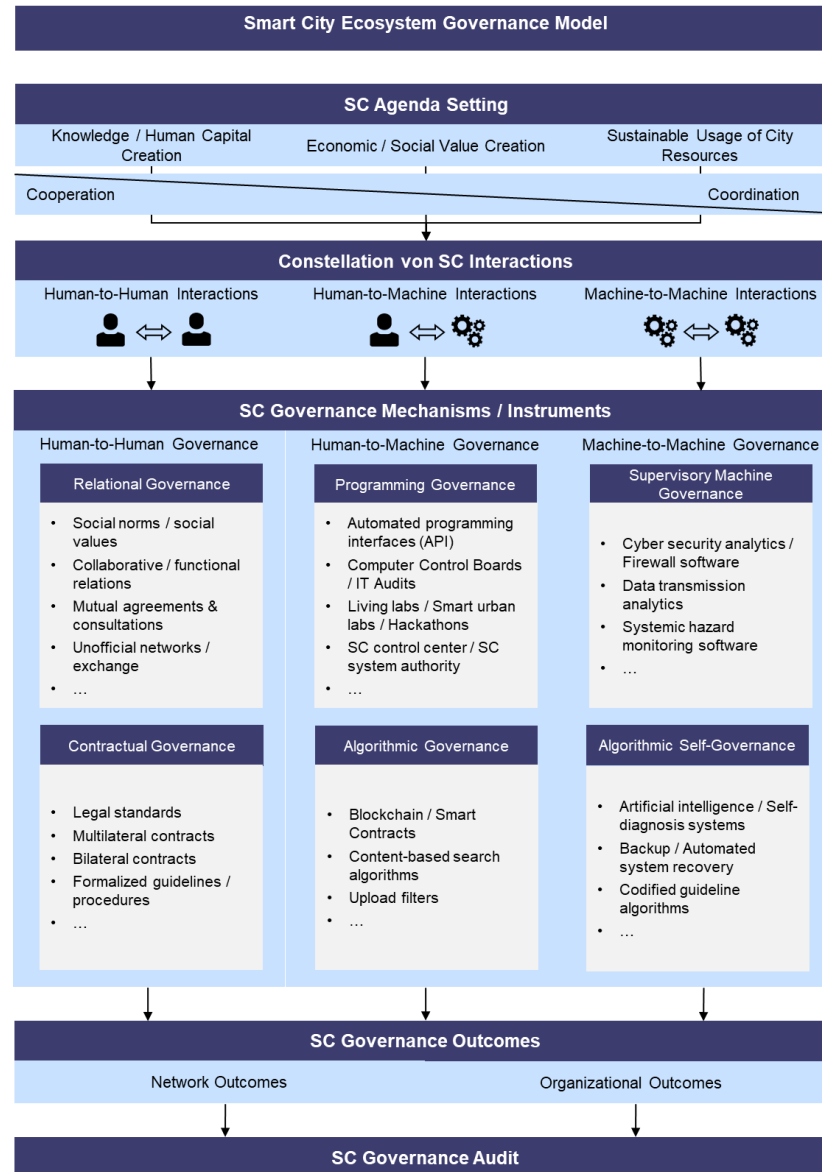


# Fig. 8.19 Integrated smart city ecosystem framework



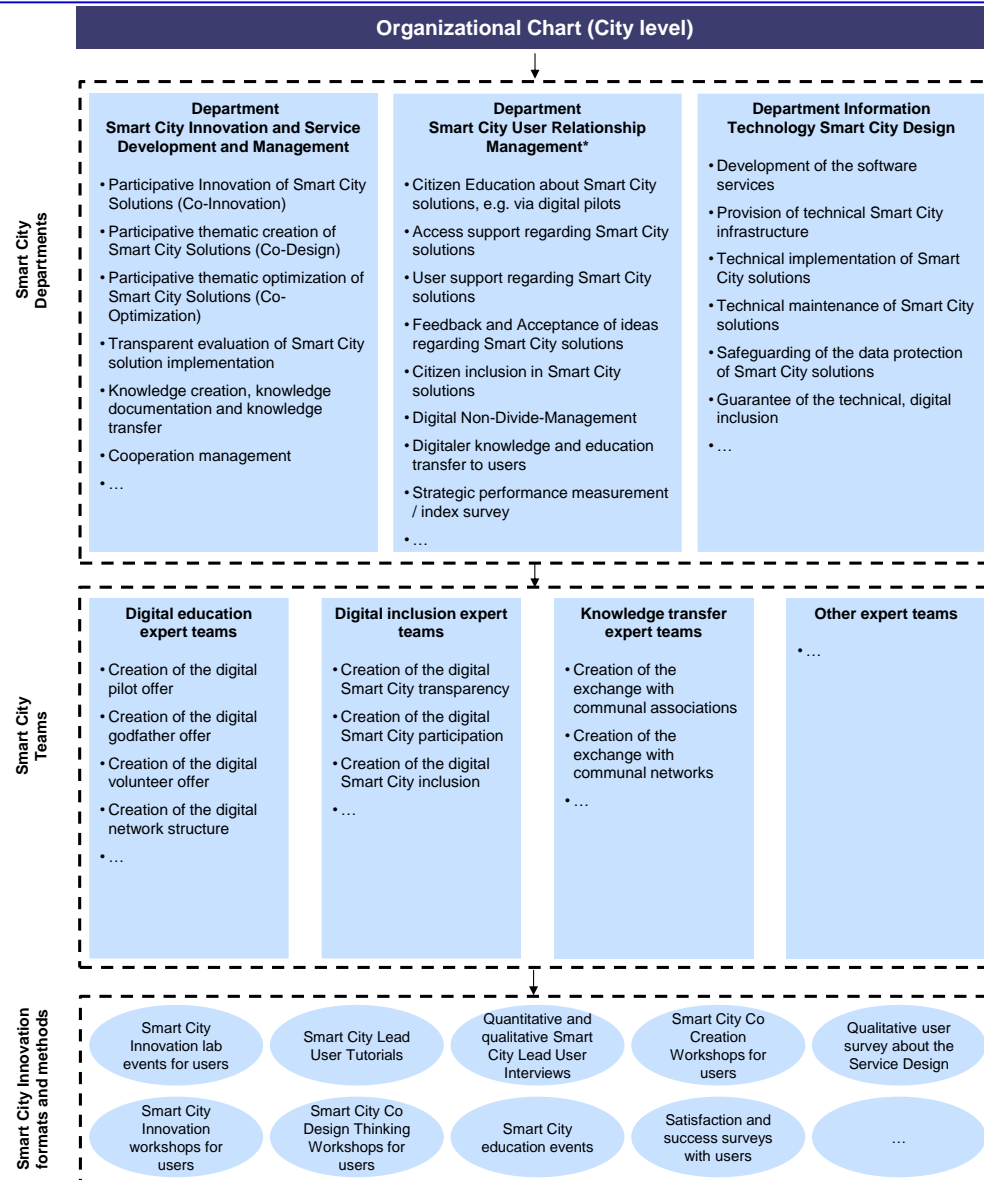
Source: Wirtz (2022)

# Fig. 8.20 Smart city ecosystem governance model



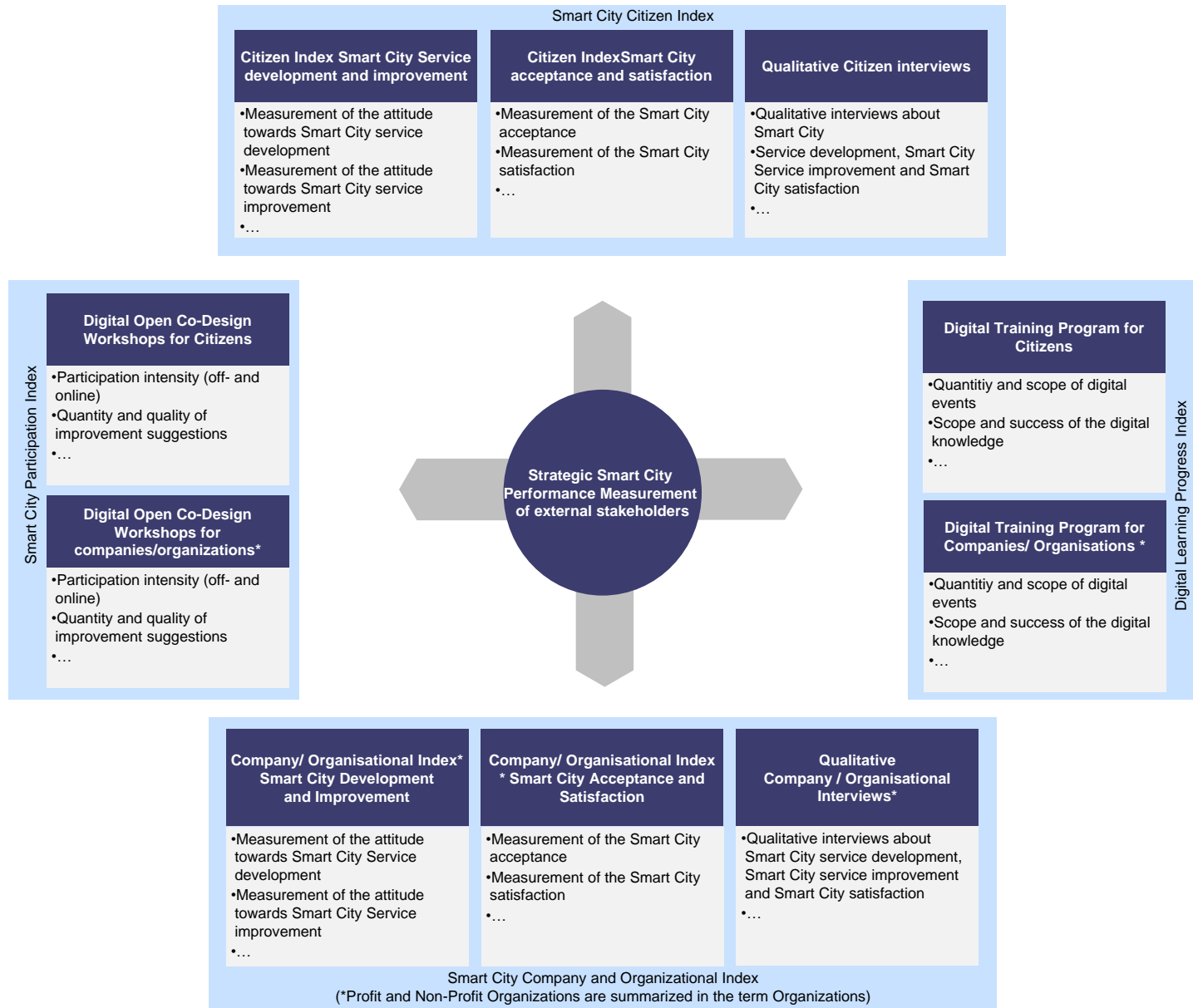
Source: Wirtz (2022)

# Fig. 8.21 Organizational design within Smart Cities

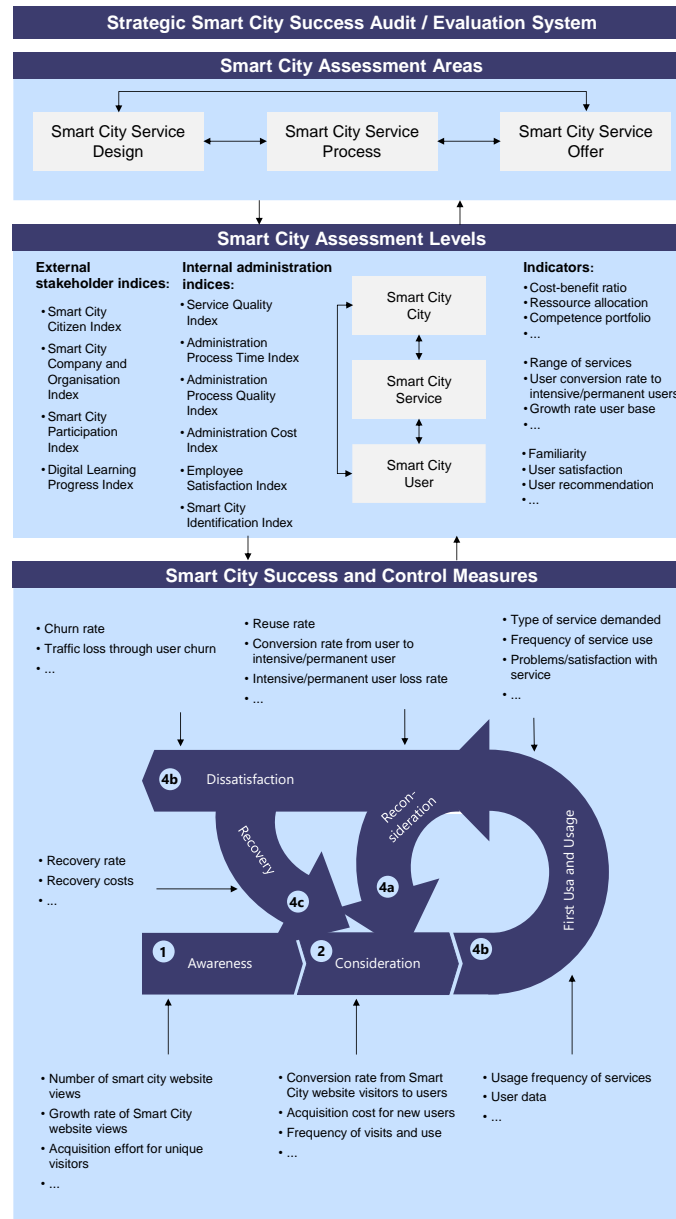


\* Users are understood to be citizens, businesses, profit and nonprofit organizations, and other stakeholders

# Fig. 8.22 Strategic Smart City Performance Measurement of the External Stakeholders



# Fig. 8.23 Strategic Smart City Success Audit / Evaluation System



Source: Wirtz (2022)

# Chapter 8

## Review questions, topics for discussion and online exercises

### Chapter 8

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Define the concept of a smart city.
2. Outline the development of the world population on the basis of the United Nations analysis up to the year 2050. What are the main changes with regard to urban development dynamics?
3. List essential smart city targets in the three areas social, economic and ecological.
4. Describe the smart city ecosystem.
5. Outline the main smart city user demand factors and their assessment.



##### Topics for classroom discussion and team debates

1. Discuss why smart cities are a central task for the global society against the background of the development of the world population.
2. In light of the increasing deterioration of resource quality (resource scarcity) and drastic climate change in the coming decades, the successful development and implementation of the smart city concept will be of crucial importance for the prosperity of the world's population. Discuss this statement in the context of the contribution of smart cities to resource conservation and climate improvement.
3. Smart city ecosystems are complex systems in terms of management and governance. Based on the model of stakeholder domains of smart city concepts, discuss how the governance of such systems can best be designed.

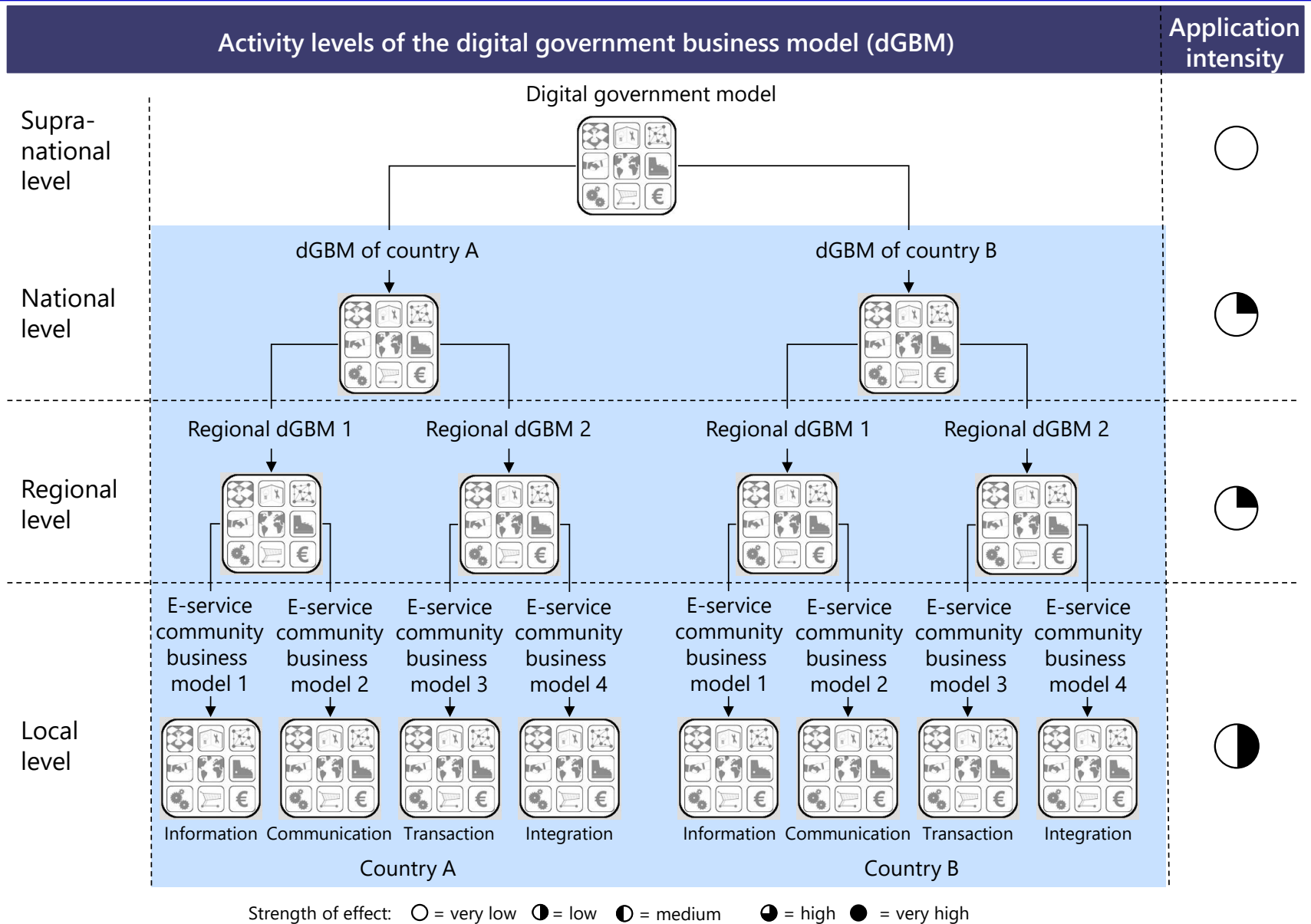


##### Online Exercises

1. Visit <https://unece.org/housing/sustainable-smart-cities>. Explore the main areas and opportunities of sustainable smart cities. What are the key lessons learned?
2. Enter <https://smart-cities-marketplace.ec.europa.eu/>. Use the map on smart city project sites as a starting point to explore the smart city projects of the European Commission.
3. Visit <https://smartamerica.org/teams/smart-cities-usa/> and explore the public-private partnership between San Jose and Intel using this website. Describe the challenges that are presented.

# **Chapter 9: Digital Government Business Models**

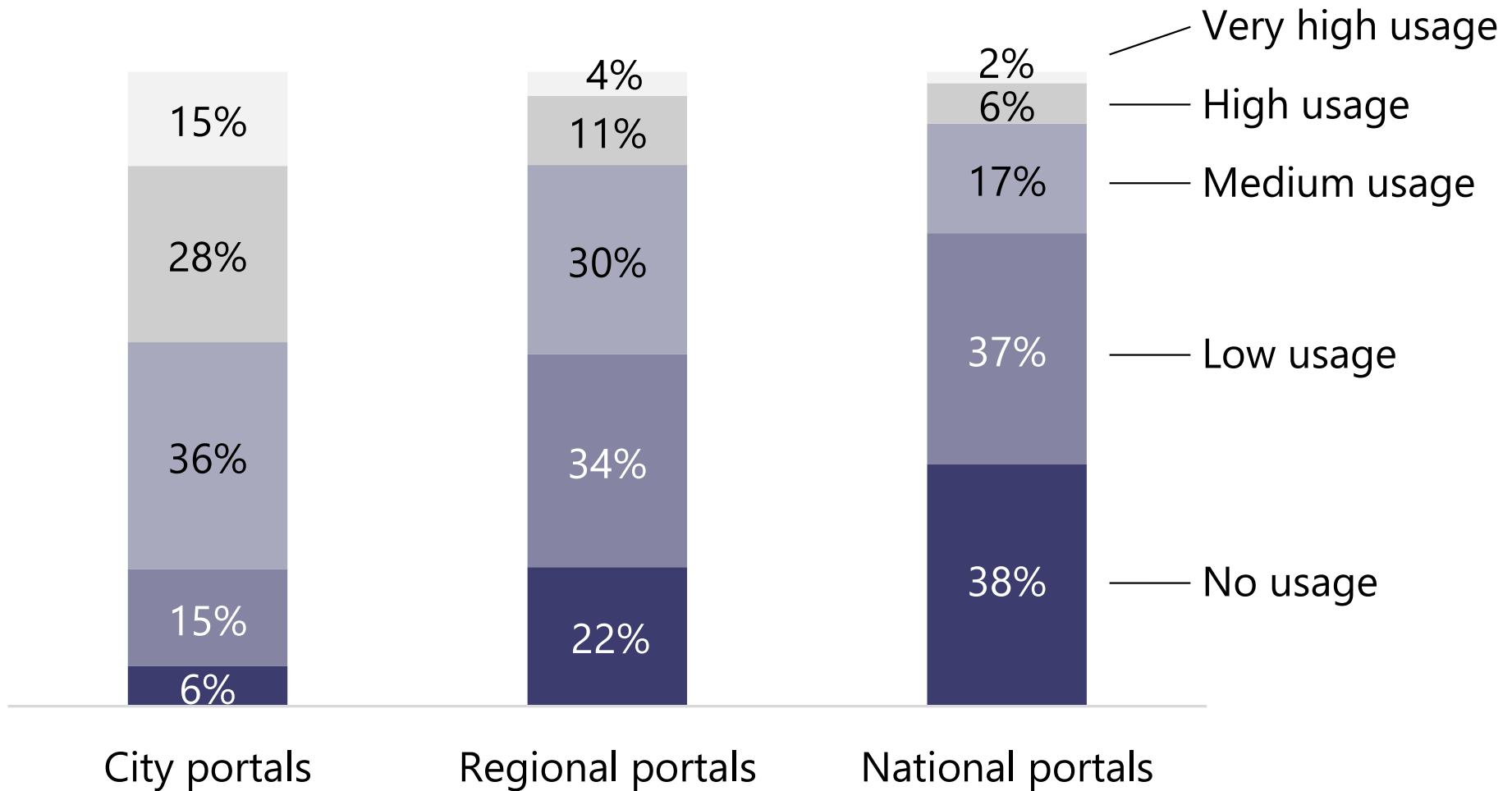
# Fig. 9.1 Digital government business model levels



Source: Wirtz and Daiser (2015), Wirtz (2011a, 2021a, 2022)



**Fig. 9.2 Digital government portal use (Germany)**



Source: Wirtz and Daiser (2015), Wirtz (2011a, 2021a, 2022)

# Definition of Public Business Model

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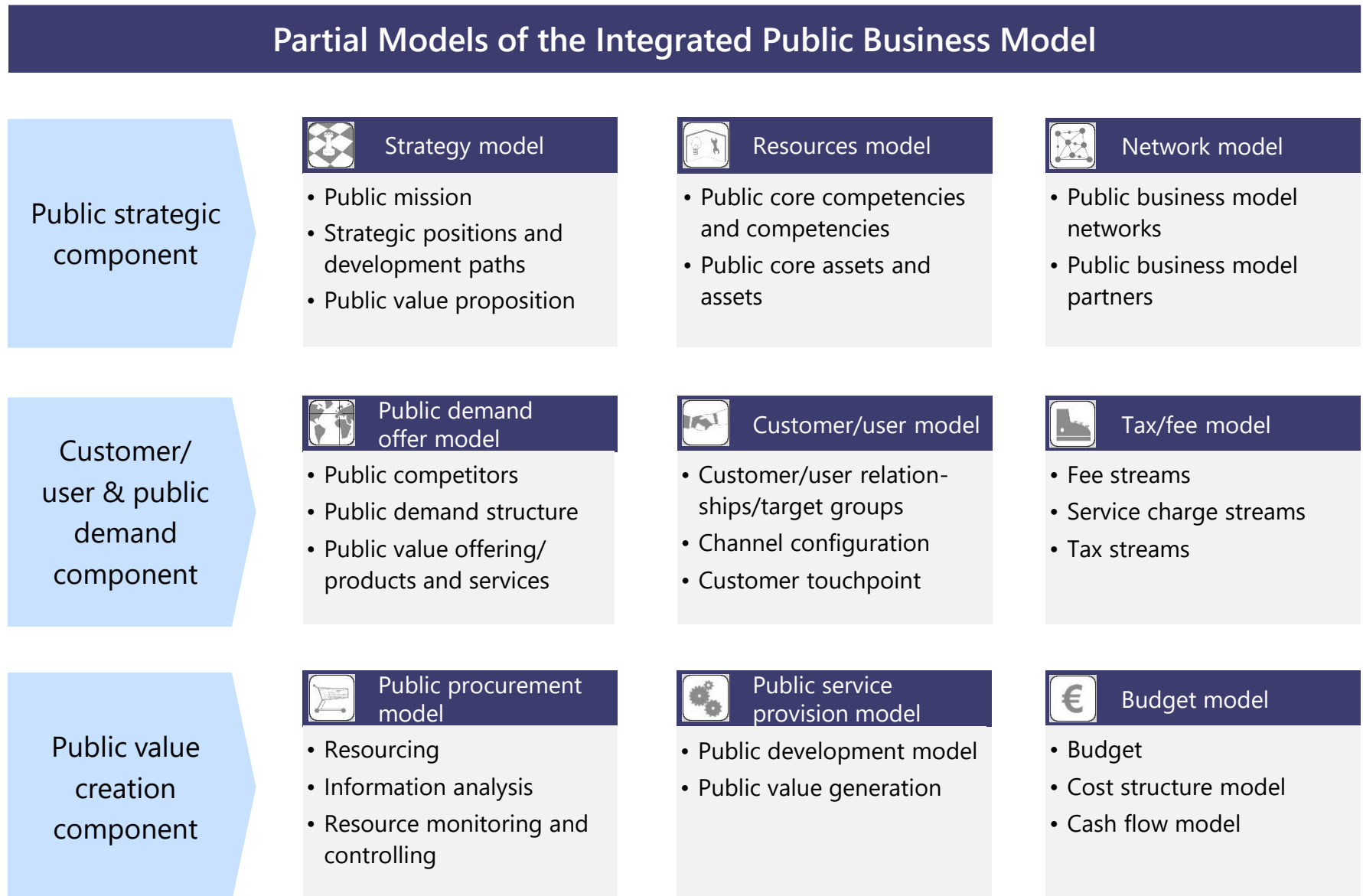
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A public business model is a simplified and aggregated representation of the relevant services, processes, and activities of a public sector organization that describes how information, products, and services that create additional value for society are developed and managed, while also considering strategic and processual as well as user and public demand components to support sustainable public value creation for society and the public service remit.

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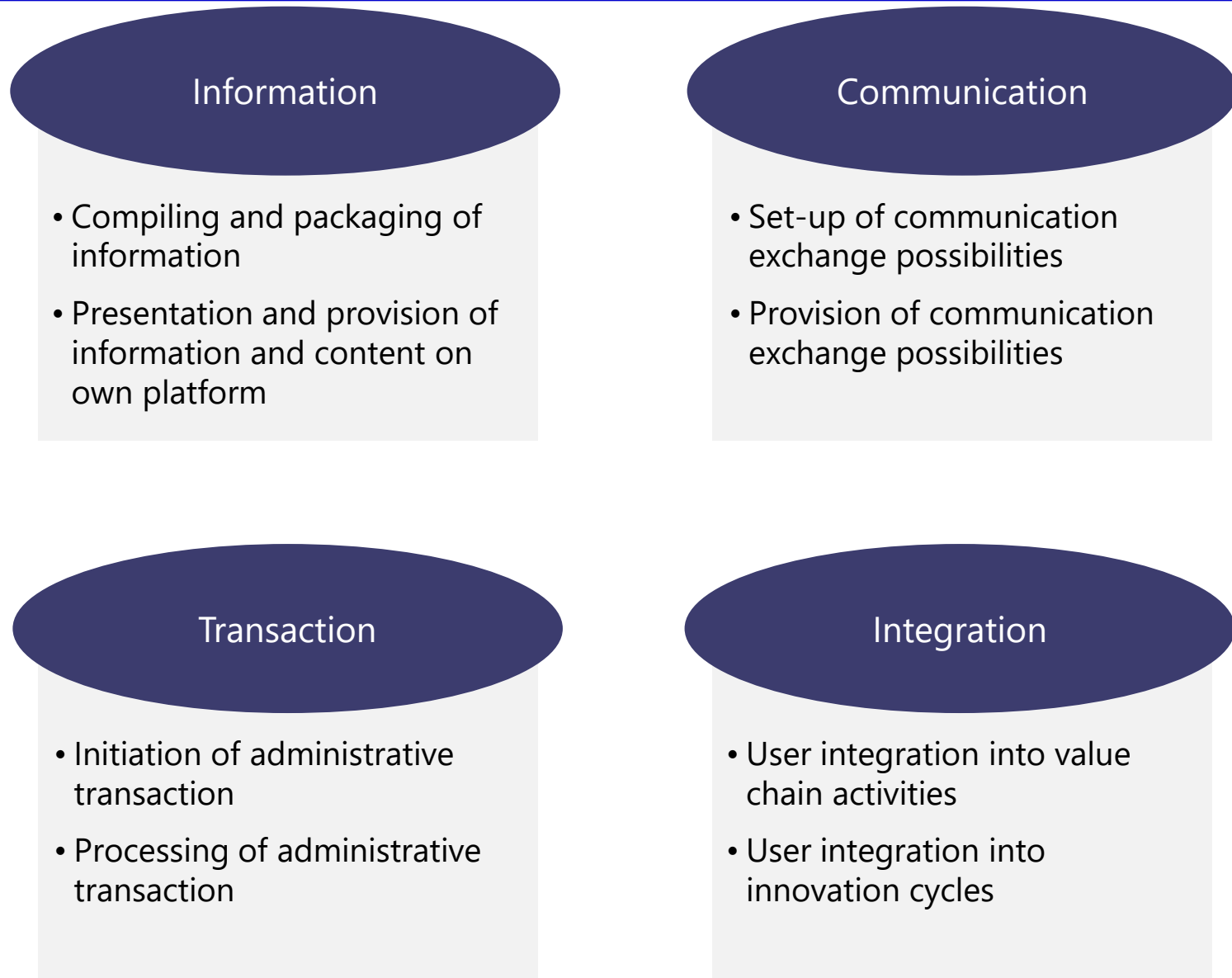
Source: [Wirtz and Daiser \(2015, 2017b\)](#), [Wirtz \(2011a, 2022\)](#)

# Fig. 9.3 Partial models of the integrated public business model



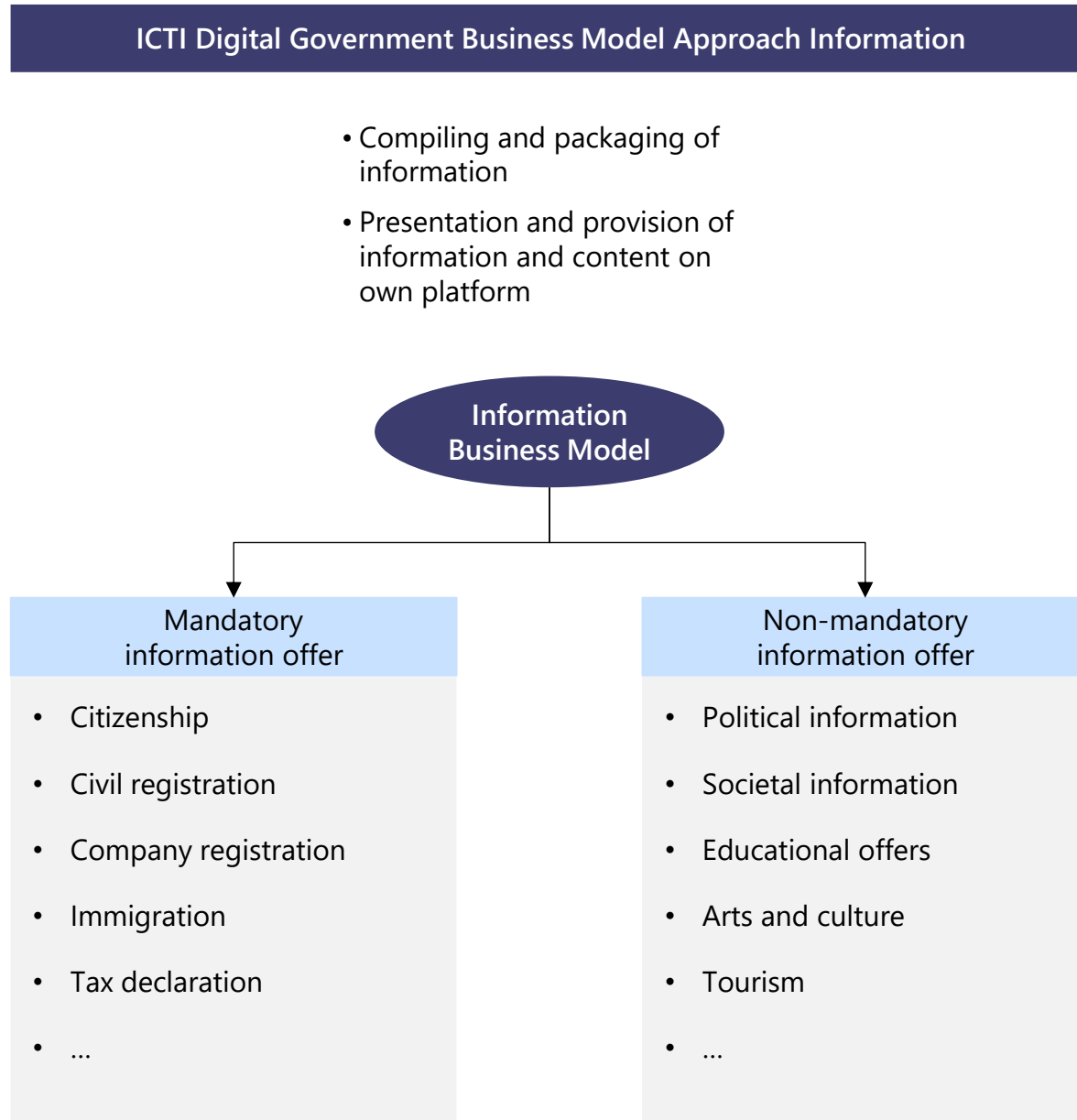
Source: Wirtz and Daiser (2015), Wirtz (2011a, 2021a, 2022)

## Fig. 9.4 ICTI digital government business models



Source: Wirtz and Daier (2015, 2017b), Wirtz (2022)

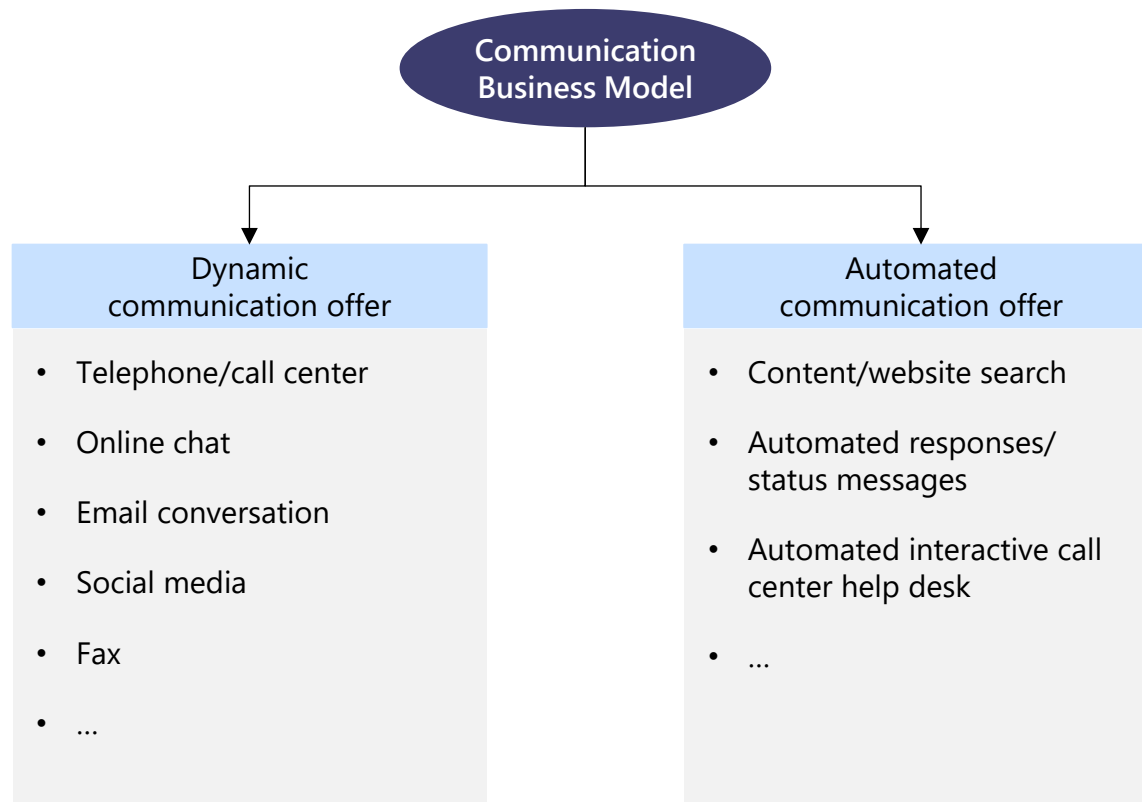
## Fig. 9.5 Digital government business model for information



## Fig. 9.6 Digital government business model for communication

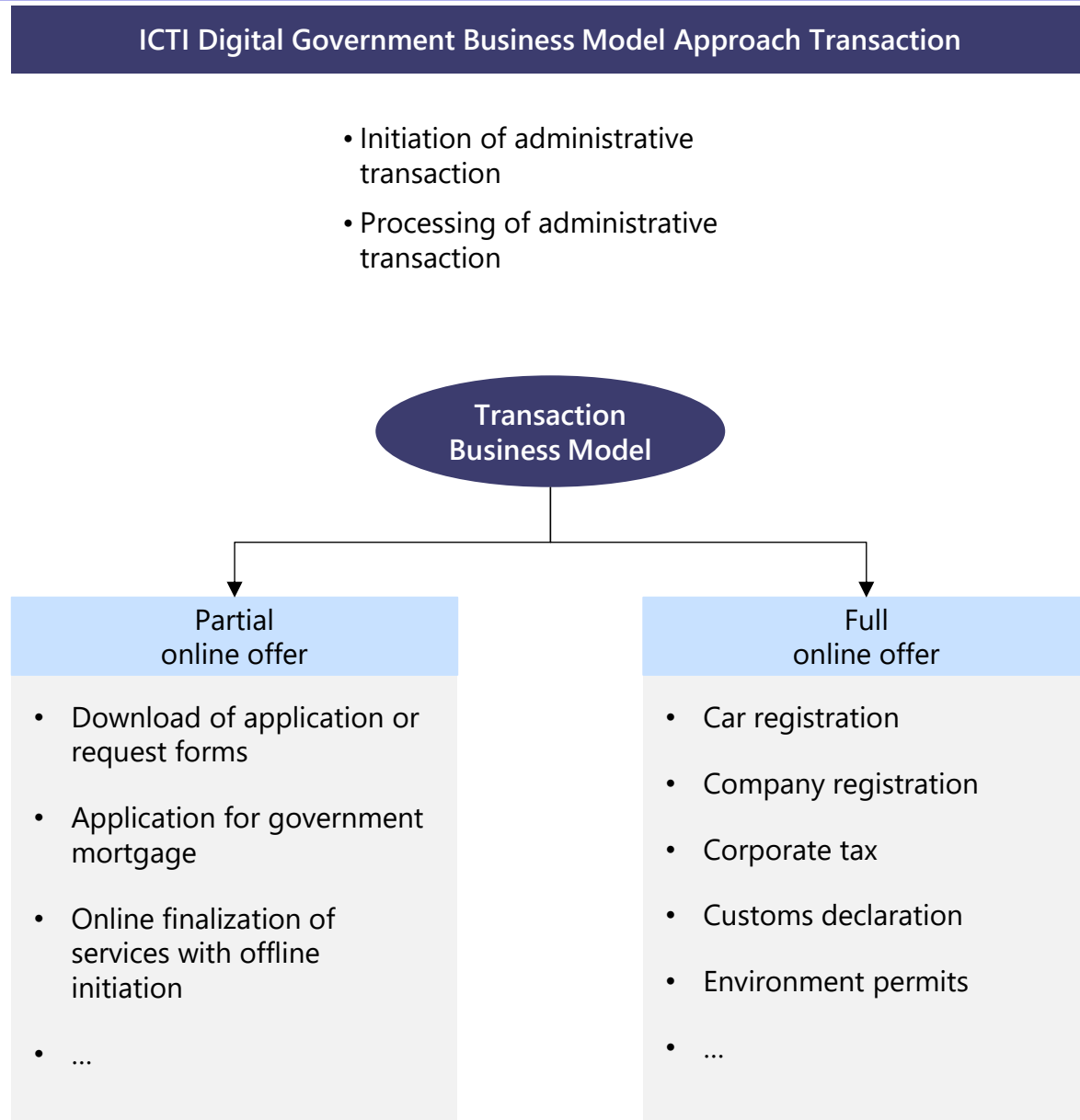
### ICTI Digital Government Business Model Approach Communication

- Set-up of communication exchange possibilities
- Provision of communication exchange possibilities



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

## Fig. 9.7 Digital government business model for transaction

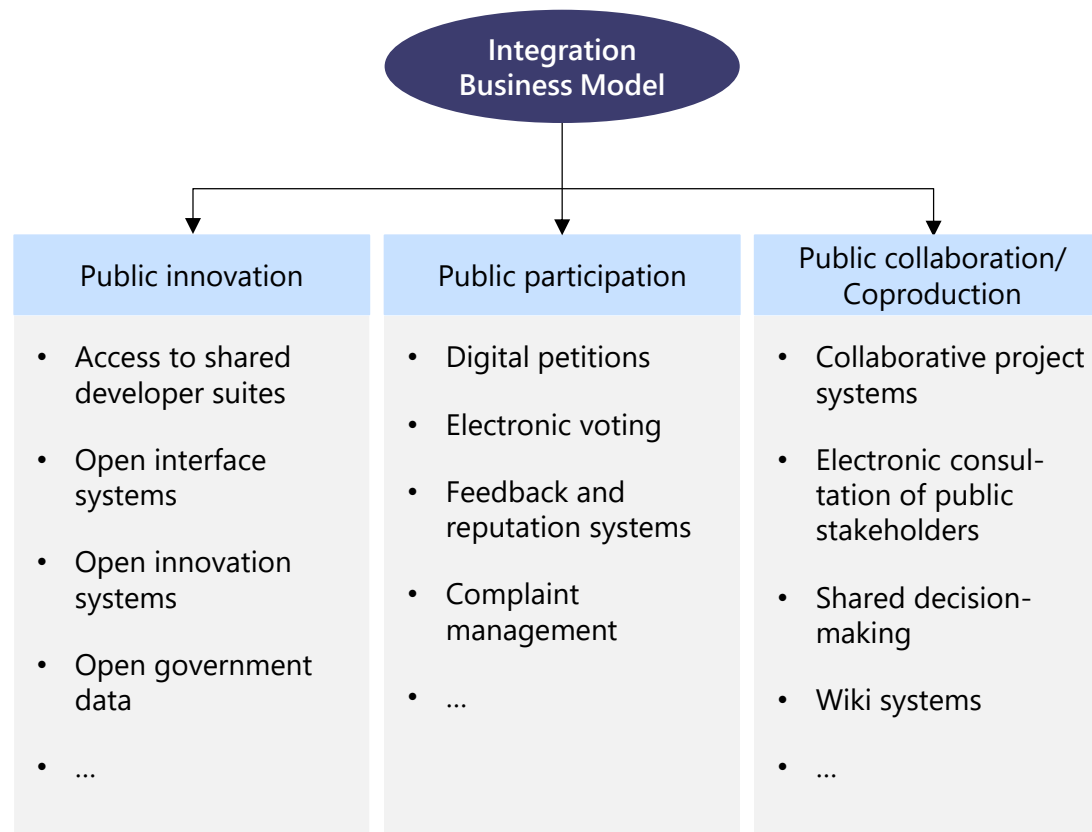


Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

## Fig. 9.8 Digital government business model for integration

### ICTI Digital Government Business Model Approach Integration

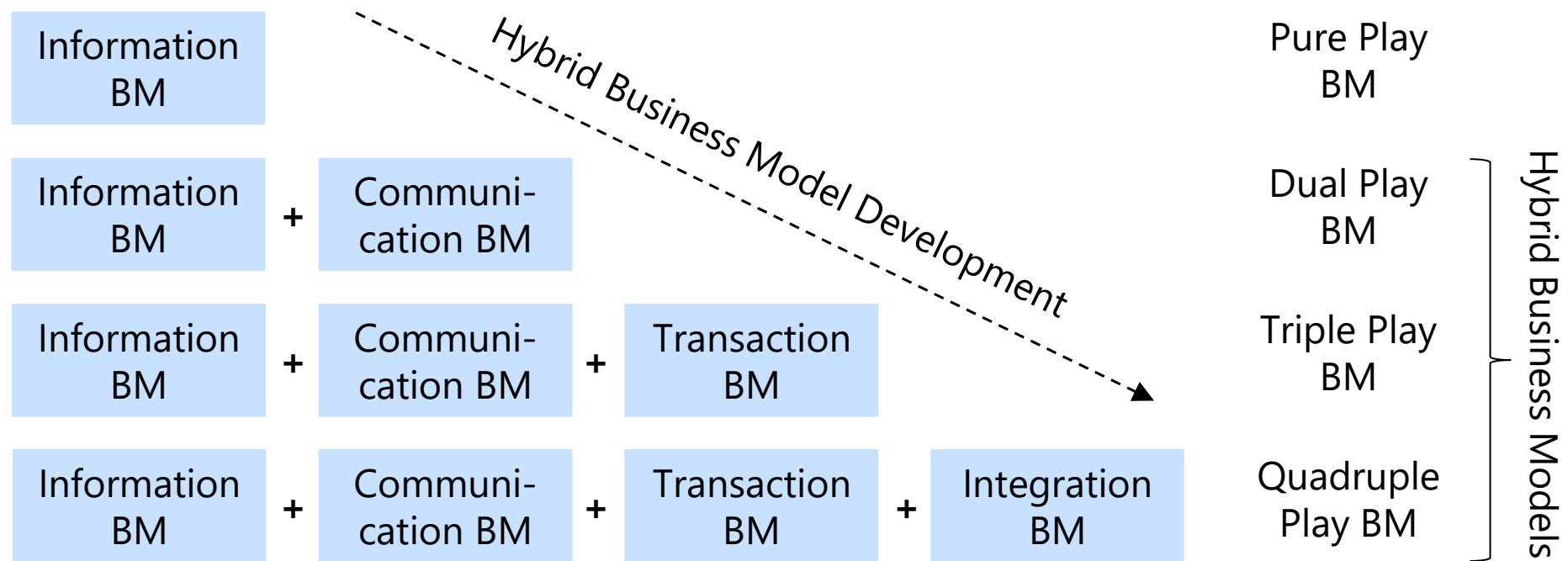
- User integration into value chain activities
- User integration into innovation cycles



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

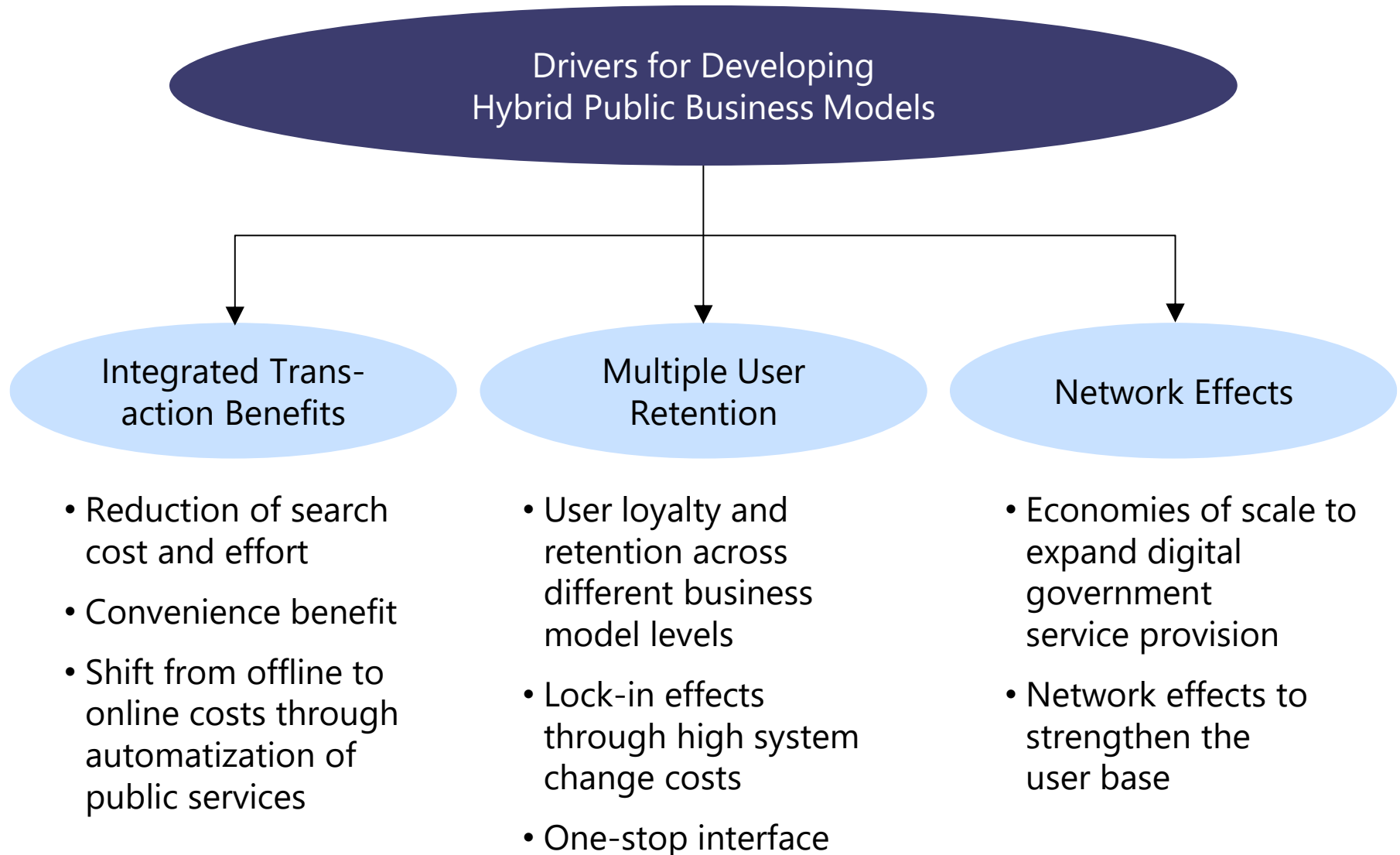


## Fig. 9.9 Hybrid business model development



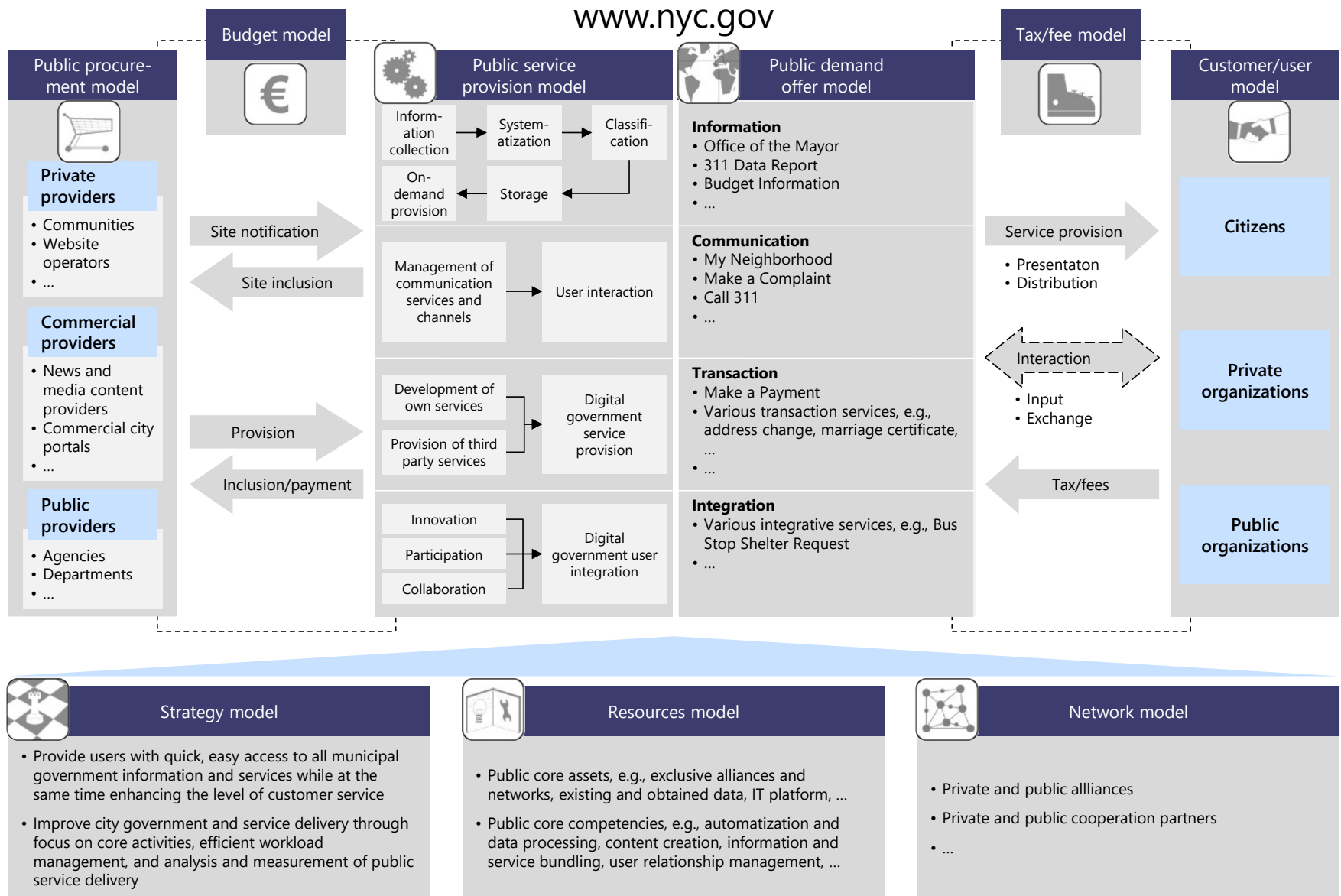
Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 9.10 Drivers of hybrid digital government business models**



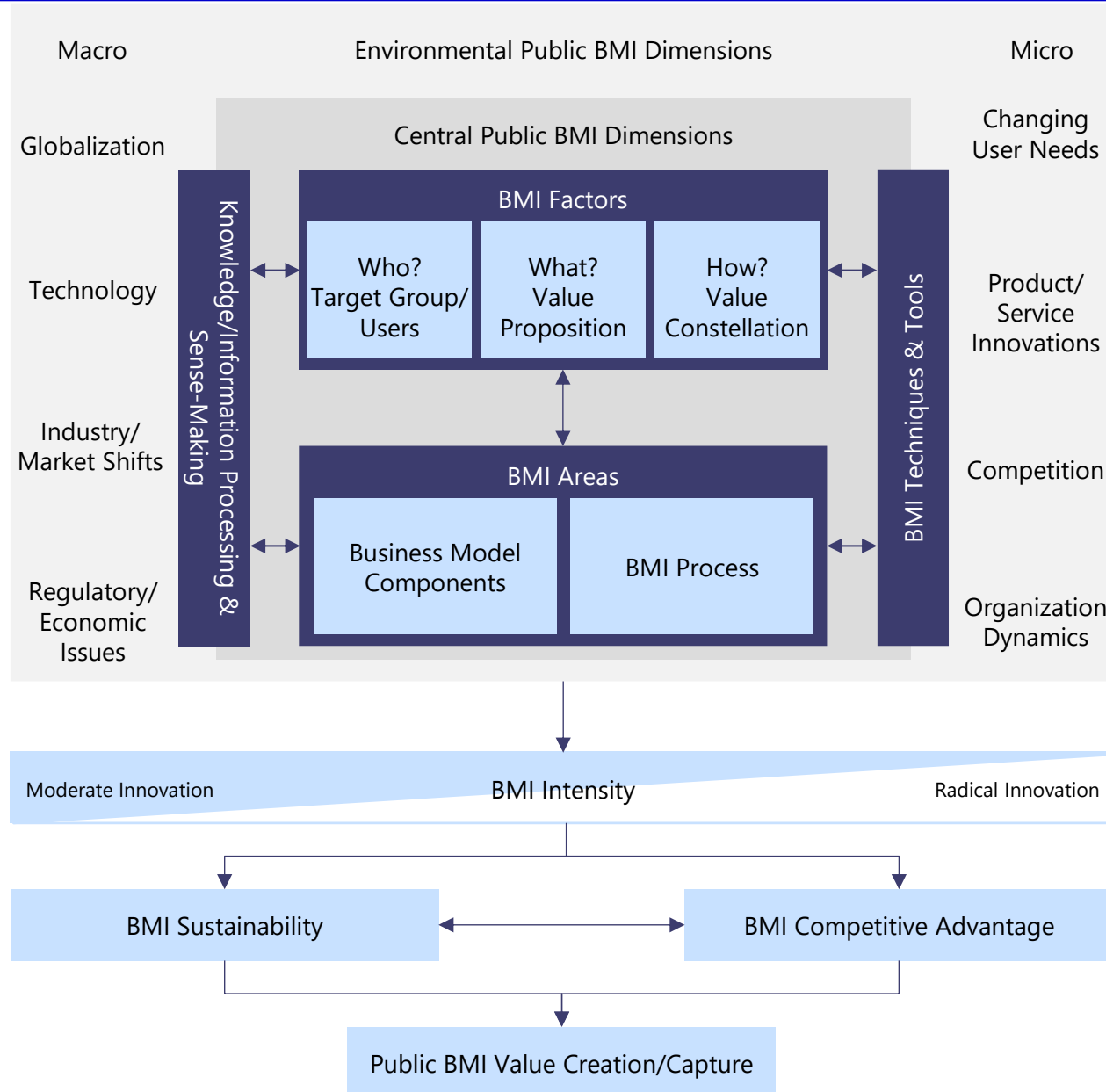
Source: Wirtz and Daiser (2015), Wirtz (2001, 2020b, 2022)

# Fig. 9.11 New York City digital government business model (illustrative example)

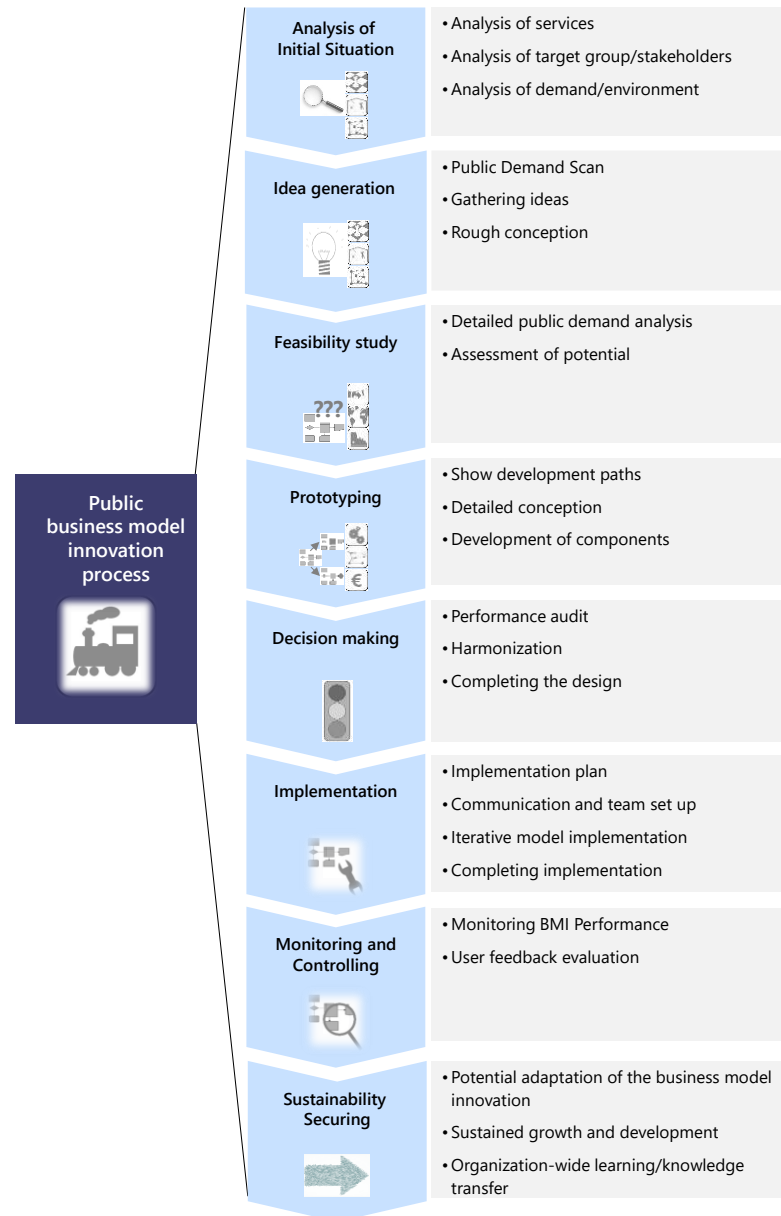


Source: Wirtz and Daiser (2015, 2017b), Wirtz (2010a, 2022)

**Fig. 9.12 Integrated concept of public business model innovation**



# Fig. 9.13 Public business model innovation process



# Chapter 9

## Review questions, topics for discussion and online exercises

### Chapter 9

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Define public business models. On which levels of digital government can business models be set up?
2. Describe and explain the partial models of the integrated public business model.
3. Explain the ICTI digital government business model approach.
4. Elaborate on why there are usually no pure play business models anymore. Present the development from pure play business models to quadruple play business models.
5. Explain the public business model innovation process.



##### Topics for classroom discussion and team debates

1. The business model concept originates from business practice. Discuss within the class why it is useful and necessary to apply the business model concept also in the public sector (reduction of bureaucracy, stronger citizen orientation, public value).
2. Discuss which of the four ICTI business models are most important for the creation of public value and to what extent each of these business model forms can be found in the digital government context of your city.
3. Debate why there is so little innovation in digital government and why a structured public business model innovation process is necessary.



##### Online Exercises

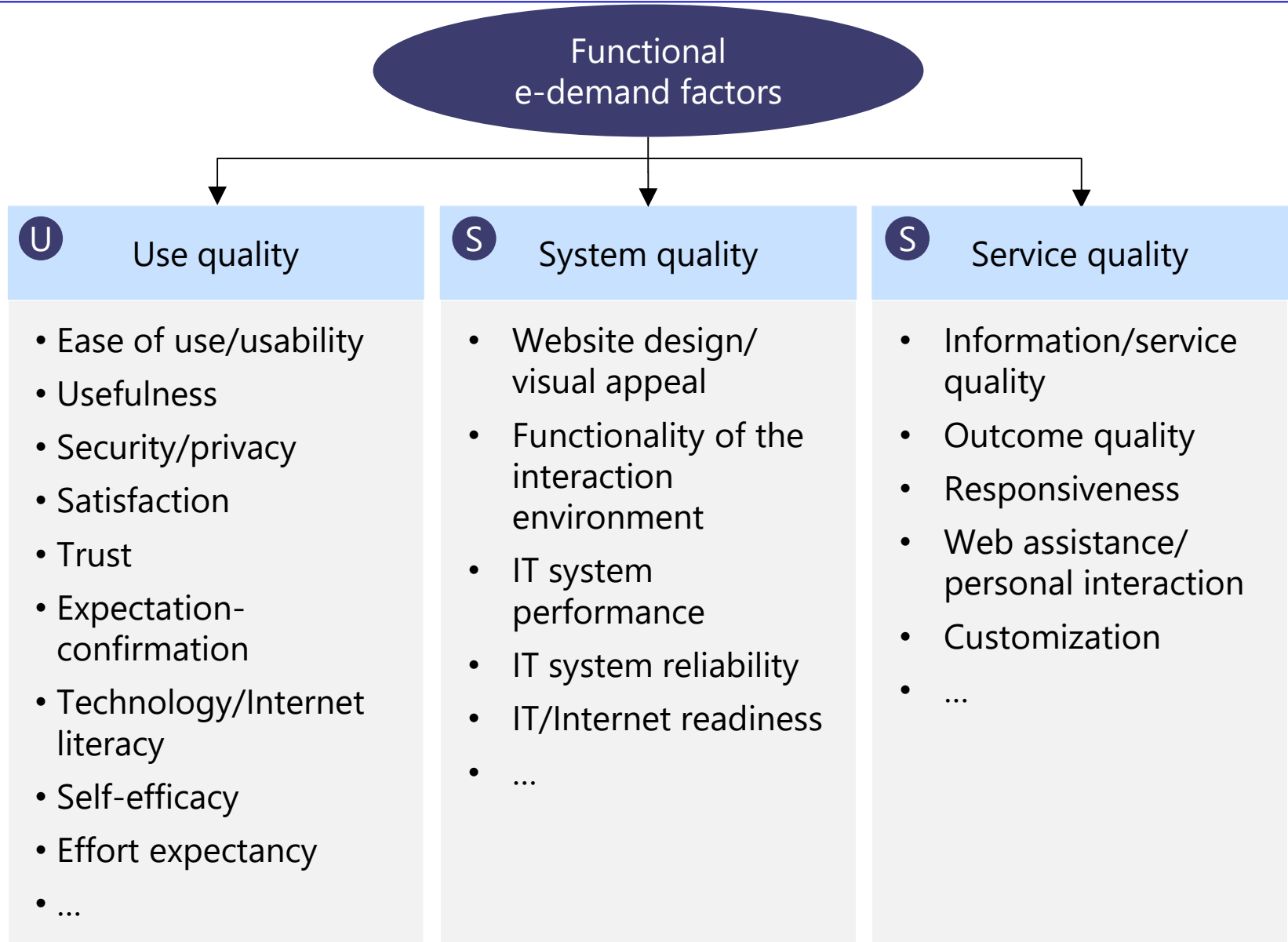
1. Visit <https://www.nyc.gov/> and identify the underlying ICTI digital government business models based on the services presented. Classify the provided services accordingly.
2. Go to <https://oecd-opsi.org/toolkits/digital-policy-model-canvas> and work through the toolkit. Use it exemplary for your own city.
3. Enter <https://govcrate.org/2019/05/05/why-business-models-are-important-for-your-e-government-initiative/> and explore the website. Discuss why business models are important for the public sector.

# **Part III - Digital Government Services, Channels and Implementation**

# **Chapter 10: User-driven Digital Government**

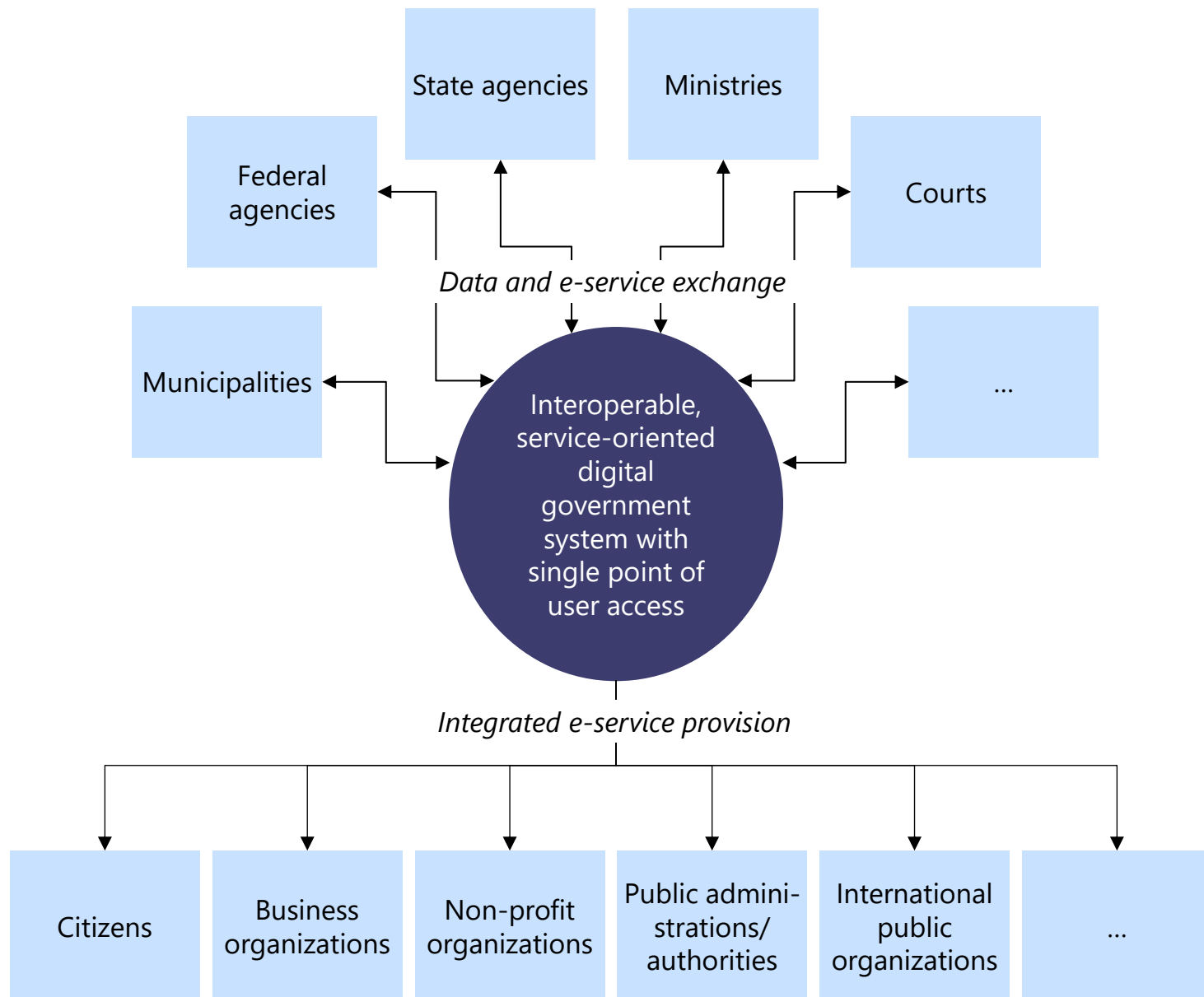


**Fig. 10.1 USS e-demand factor system**



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 10.2 Schematic digital government portal network**

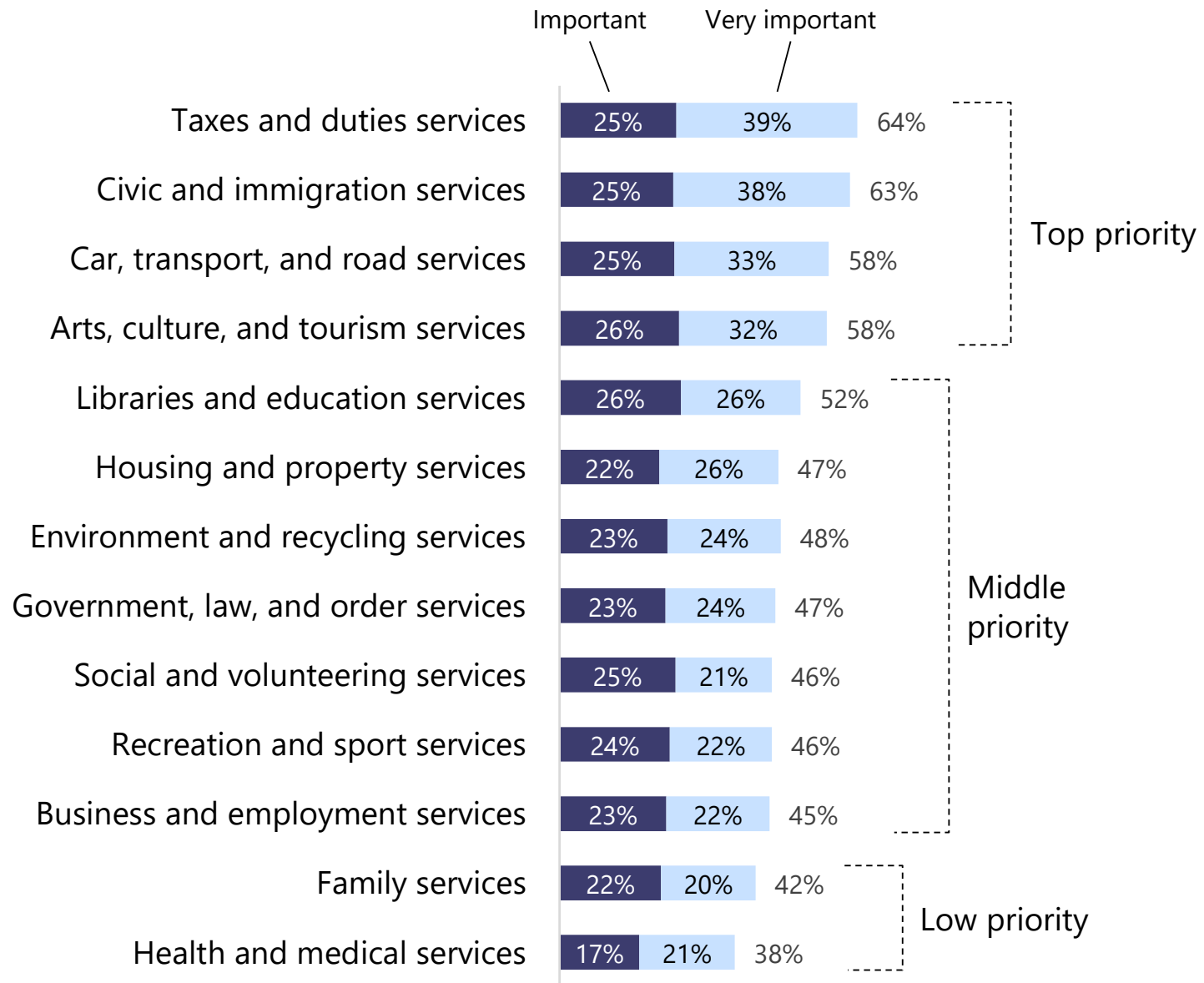


Source: Wirtz and Daiser (2015), Wirtz (2021b, 2022)

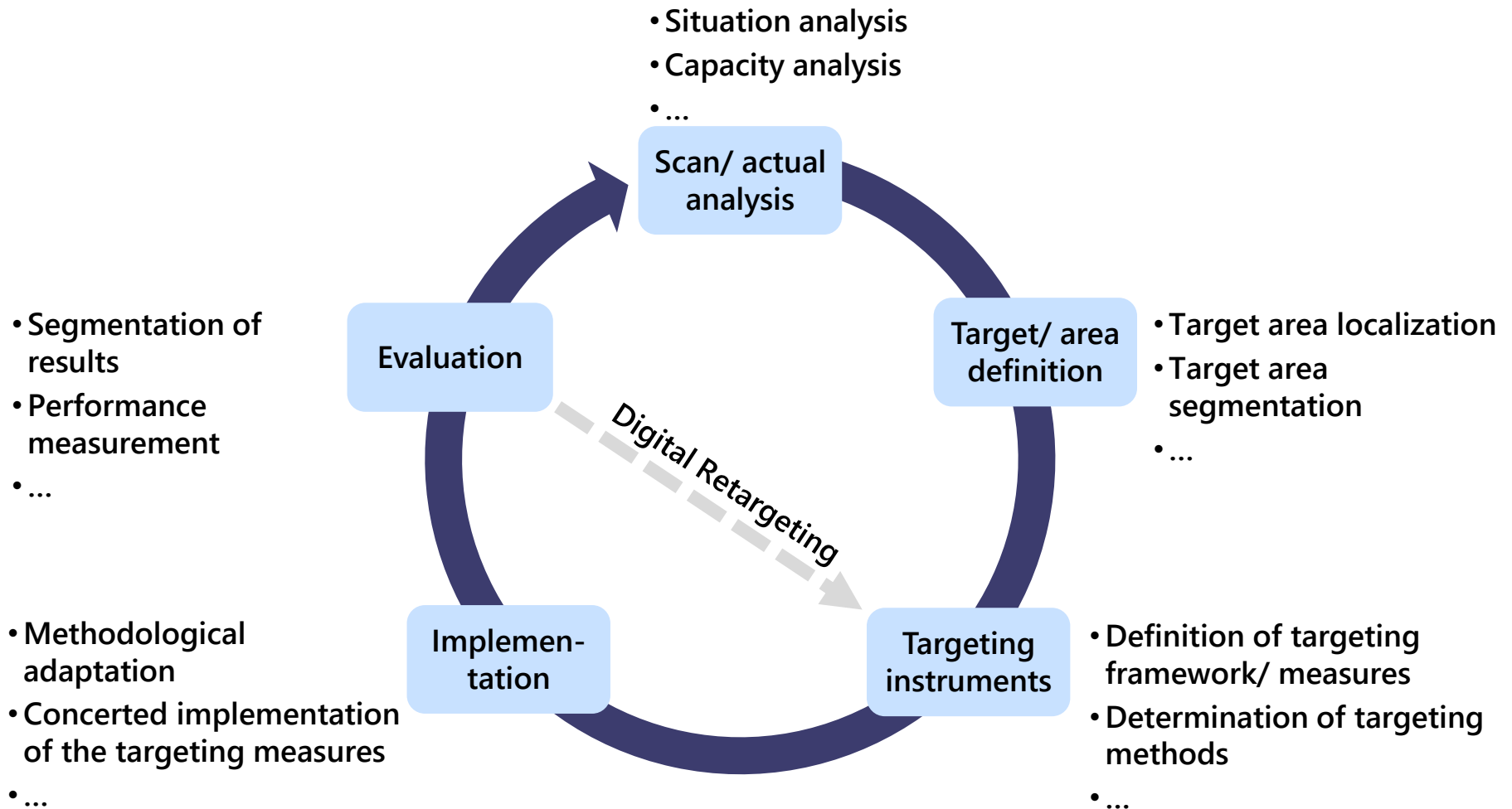
## Table 10.1 Digital government service preference categories

Digital Government Service Preferences	Information and Service Examples
Civic and immigration services	ID card, residence permit, and driver license application, divorce information, voter assistance
Health and medical services	Insurance services, facility information, nutrition information, vaccines information
Business and employment services	License application, financial services, legal assistance, job portal, job hunting information
Taxes and duties services	Tax declaration service, tax payment service, property tax information
Car, transport, and road services	Vehicle registration, public transport information, parking license service, accident information
Housing and property services	Affordable housing information, construction permit services, utility information
Social and volunteering services	Social security information, community program information, donation service
Family services	Child care information, adoption information, day care center information
Government, law, and order services	Electoral matters, consumer protection, crime and government reports, coast guard information
Arts, culture, and tourism services	Locations, activities, funding and support, visitor information
Recreation and sport services	Park and nature information, sport locations, sport activities, youth event information
Libraries and education services	Enrollment, e-book services, student support, rules and policies, adult education
Environment and recycling services	Garbage and recycling information, animal control, air and water quality information

**Fig. 10.3 Importance of digital government service preference categories**

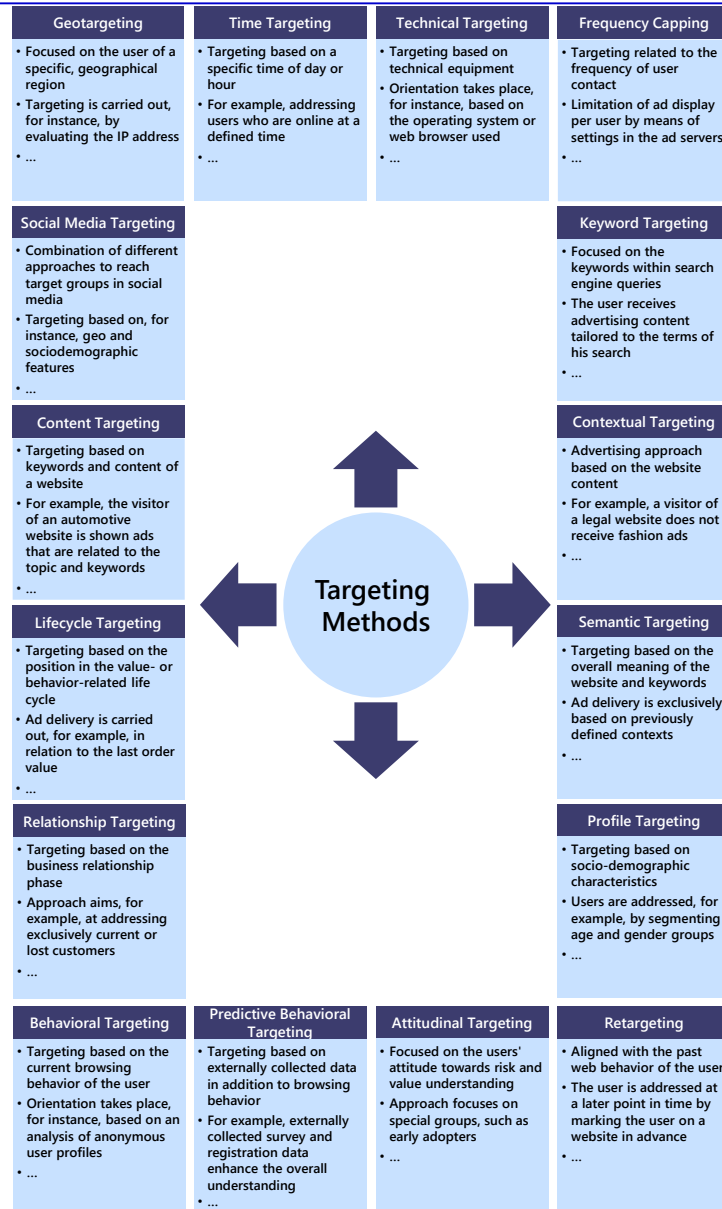


## Fig. 10.4 Targeting process



Source: Wirtz (2020b, 2021b, 2022)

# Fig. 10.5 Targeting methods



Source: Wirtz (2020b, 2021b, 2022)

## Table 10.2 Selected definitions of relationship marketing

Author(s)	Definition
Copulsky and Wolf (1990)	Relationship marketing combines elements of general advertising, sales promotion, public relations, and direct marketing to create more effective and more efficient ways of reaching consumers. It centers on developing a continuous relationship with consumers across a family of related products and services
Morgan and Hunt (1994)	Relationship marketing refers to all marketing activities directed toward establishing, developing, and maintaining successful relational exchanges
Sheth and Parvatiyar (1995)	Relationship marketing attempts to involve and integrate customers, suppliers and other infrastructural partners into a firm's developmental and marketing activities
Heller Baird and Parasnis (2011)	Customer relationship management strategy, enabled by processes and technologies, is designed to manage customer relationships as a means for extracting the greatest value from customers over the lifetime of the relationship. These strategies typically concentrate on the operational responses required to manage the customer

Source: Wirtz (2013a, 2020b, 2021b, 2022)

# Definition of Digital Government-related User Relationship Management

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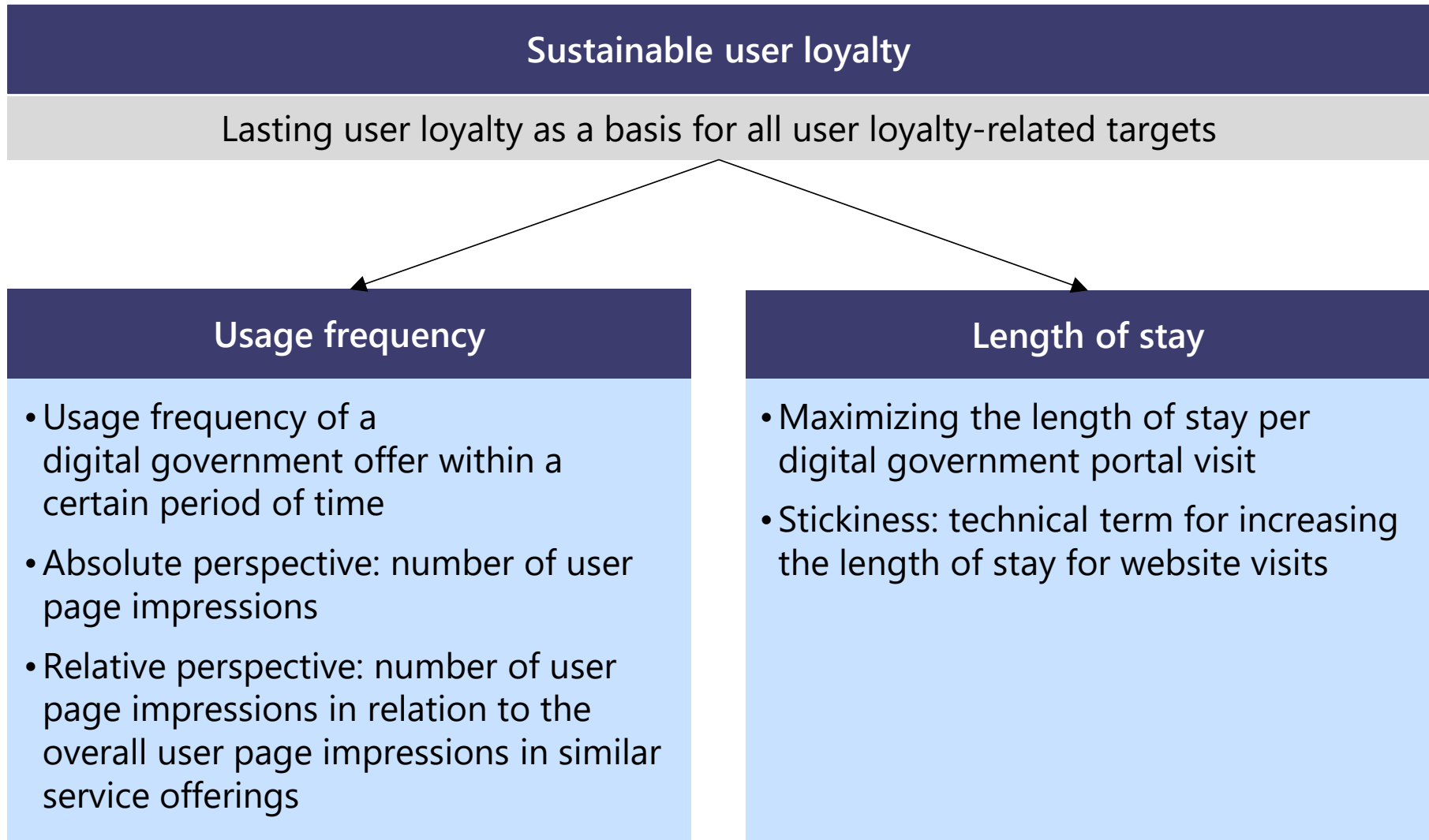
Digital government user relationship management includes the information and communication technology-based planning, organizing, steering, and controlling of user relationships, with the aim to make a successful contribution to public value.

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Source: [Wirtz \(2003, 2022\)](#)



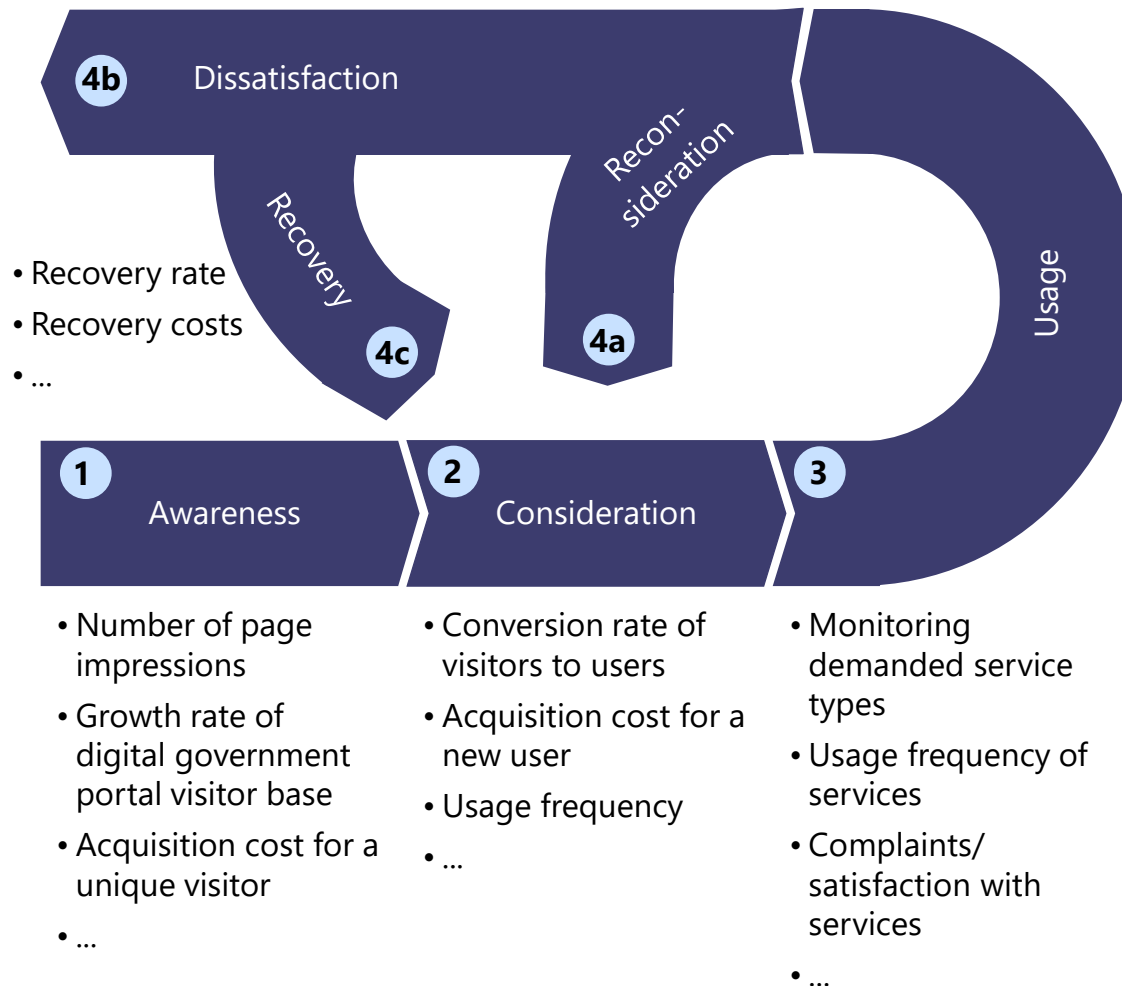
**Fig. 10.6 Target dimensions of user loyalty**



Source: Wirtz (2003, 2020b, 2021b, 2022)

## Fig. 10.7 Digital government user relationship management process

- Churn rate
- Traffic loss through user churn
- ...
- Conversion rate of users to regular users
- Loss rate of regular users
- ...



# Fig. 10.8 Integrated digital government user relationship management

Business model-related user demand	Information	Communication	Transaction	Integration
Frequency	daily weekly	daily weekly	weekly monthly yearly	weekly monthly yearly
Local portal (e.g., New York City www.nyc.com)	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Blogs</li> <li>• Content communities</li> <li>• Social net-working sites</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Blogs</li> <li>• Content communities</li> <li>• Social net-working sites</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Social net-working sites</li> </ul>
Regional portal (e.g., Hong Kong www.gov.hk)	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Blogs</li> <li>• Content communities</li> <li>• Collaborative projects</li> <li>• Social net-working sites</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Blogs</li> <li>• Content communities</li> <li>• Collaborative projects</li> <li>• Social net-working sites</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Collaborative projects</li> <li>• Social net-working sites</li> </ul>
National portal (e.g., Germany www.bundesregierung.de)	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Blogs</li> <li>• Content communities</li> <li>• Social net-working sites</li> </ul>	<ul style="list-style-type: none"> <li>• Digital government portal</li> <li>• Content communities</li> <li>• Social net-working sites</li> </ul>		

# Chapter 10

## Review questions, topics for discussion and online exercises

### Chapter 10

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Outline the USS e-demand factor system and describe all aspects of the three quality functions.
2. Describe the schematic digital government portal network structure.
3. Divide the digital government service preference categories into top, middle, and low priority areas based on their importance to users.
4. Name the 16 targeting methods and briefly explain them.
5. Describe the digital government user relationship management process.



##### Topics for classroom discussion and team debates

1. Debate why digital government use is low in many countries. Focus in particular on the aspect of whether public administration successfully implements the user success factors according to the USS e-demand factor system.
2. Discuss the most important service groups and individual services for the success of digital government in terms of the different service categories (taxes, arts, etc.). Should all these service categories be offered in one portal or in different portals at local/regional/national level?
3. Against the background of the digital government user relationship management process, discuss the success factors that the design of the user relationship must have in order to create a successful city user portal. In your discussion, consider the integrated relationship management of information, communication, transaction, and integration.

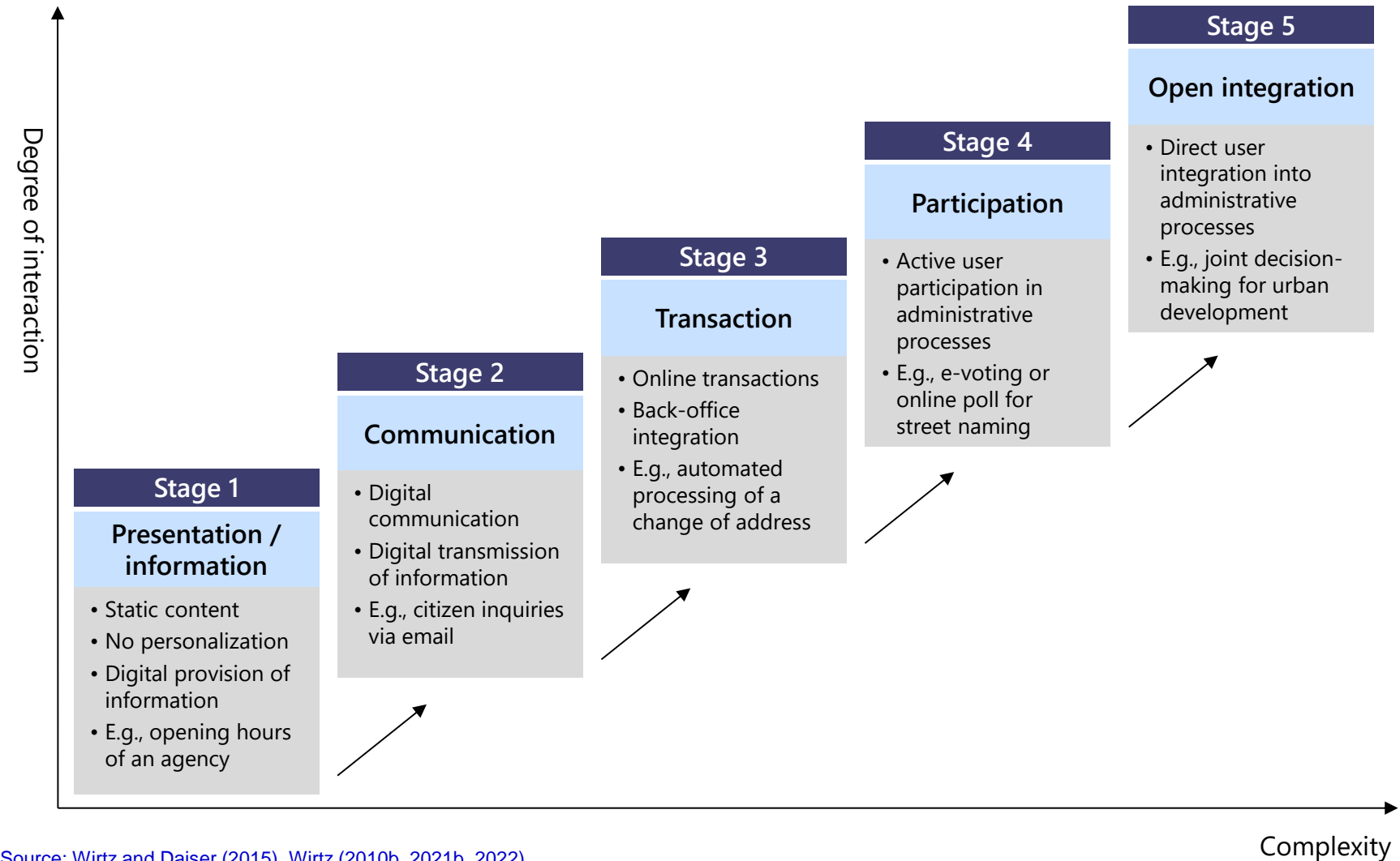


##### Online Exercises

1. Go to <https://www.cityoflondon.gov.uk/> and identify the service categories offered.
2. Visit <https://www.lacity.org>, <https://www.ca.gov/> and <https://www.usa.gov/>. Compare the websites in terms of service aspects.
3. Keeping in mind the three levels (local, regional, and national) determine if these pages are specifically targeted to the digital government user relationship process. Identify relevant points of the USS e-demand factor system for each page.

# **Chapter 11: Digital Government Services**

**Fig. 11.1 Digital government development stage model**



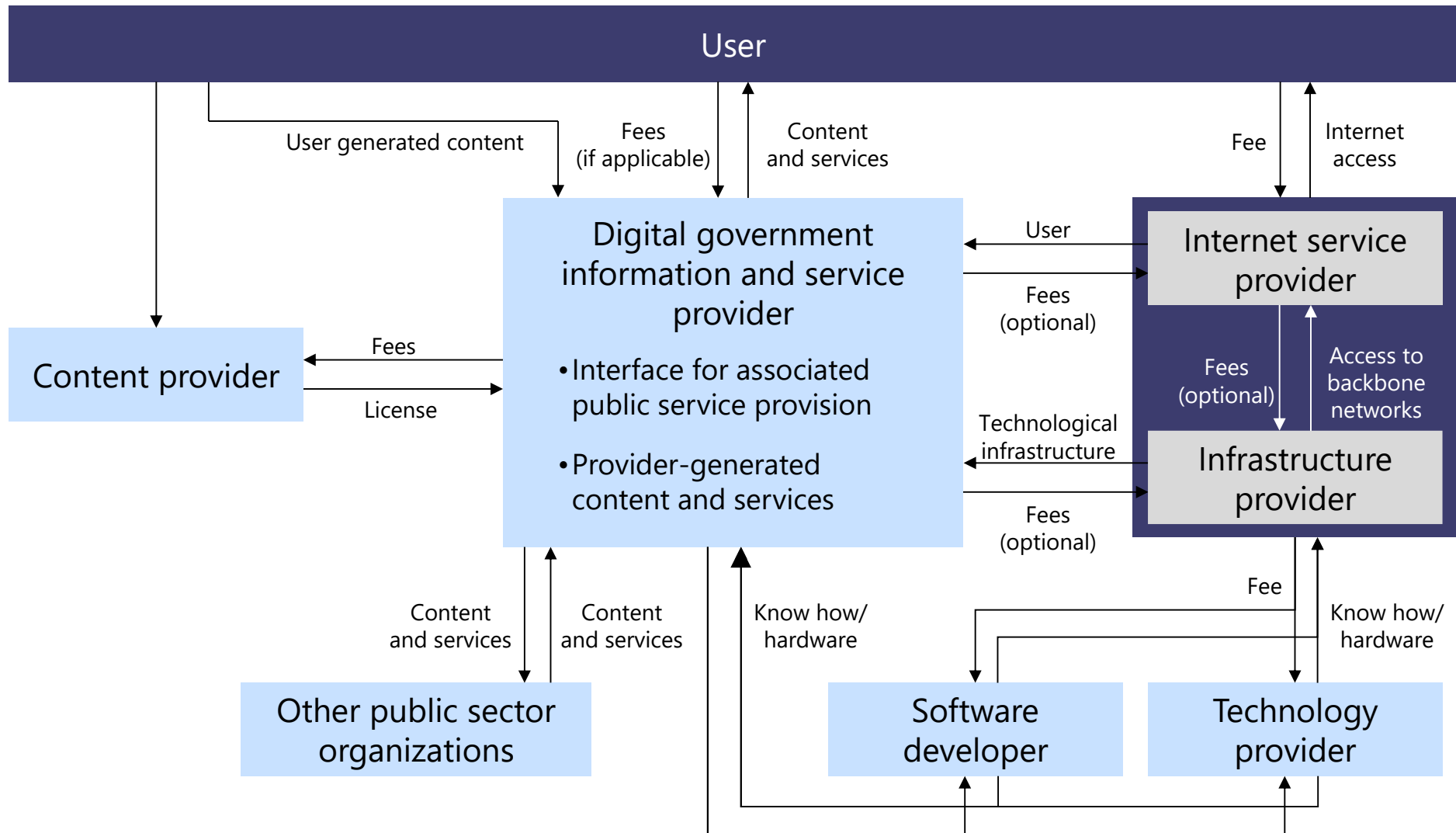
Source: Wirtz and Daiser (2015), Wirtz (2010b, 2021b, 2022)

**Fig. 11.2 Digital government interaction matrix**

Information and service provider	Administration	Administration to Organization	Administration to Citizen	Administration to Administration	Intra-Administration
	Citizen	NA (Not Applicable)	NA (Not Applicable)	Citizen to Administration	NA (Not Applicable)
	Organization	NA (Not Applicable)	NA (Not Applicable)	Organization to Administration	NA (Not Applicable)
		Organization	Citizen	Administration	Intra
Information and service recipient					

Source: Wirtz and Daiser (2015), Wirtz (2013a, 2021b, 2022)

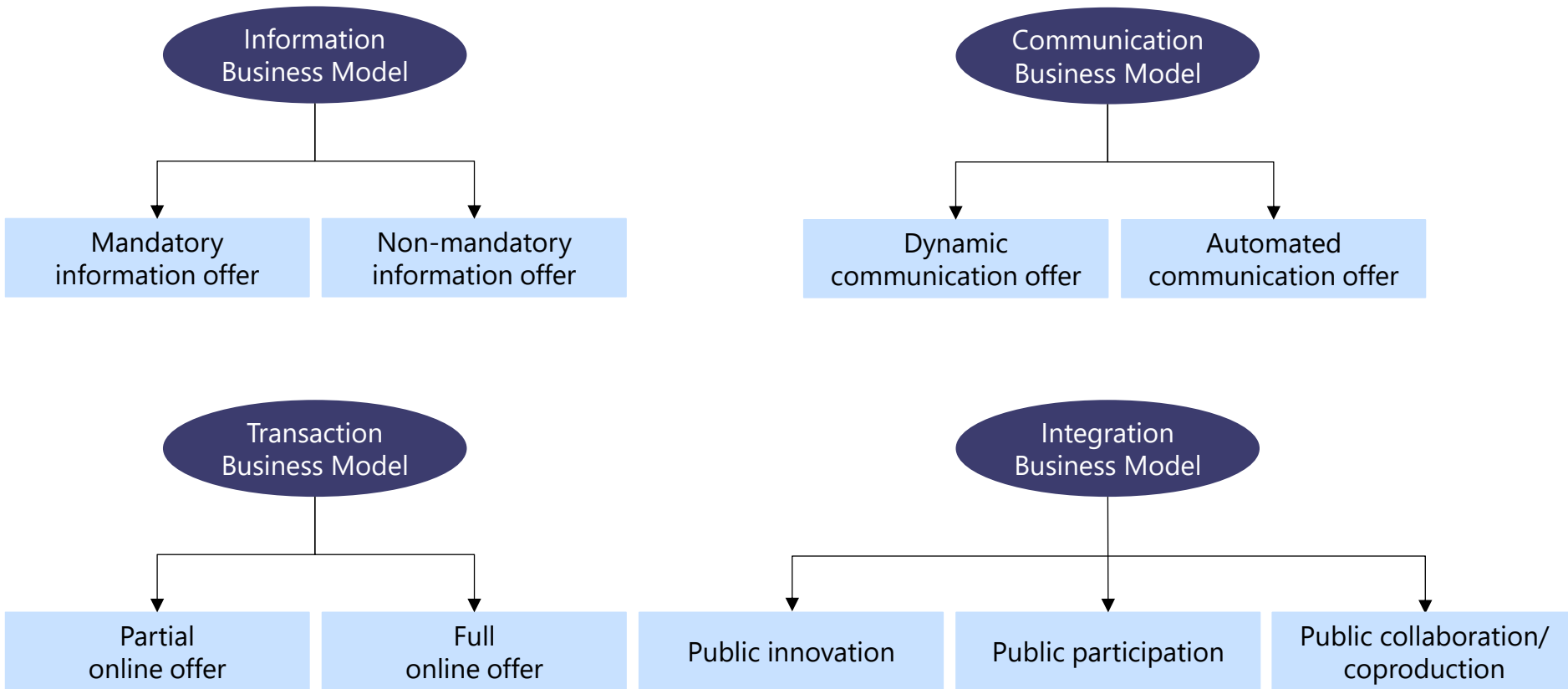
## Fig. 11.3 Schematic digital government actors and interactions structure



Source: Wirtz and Daiser (2015), Wirtz (2013b, 2021b, 2022)

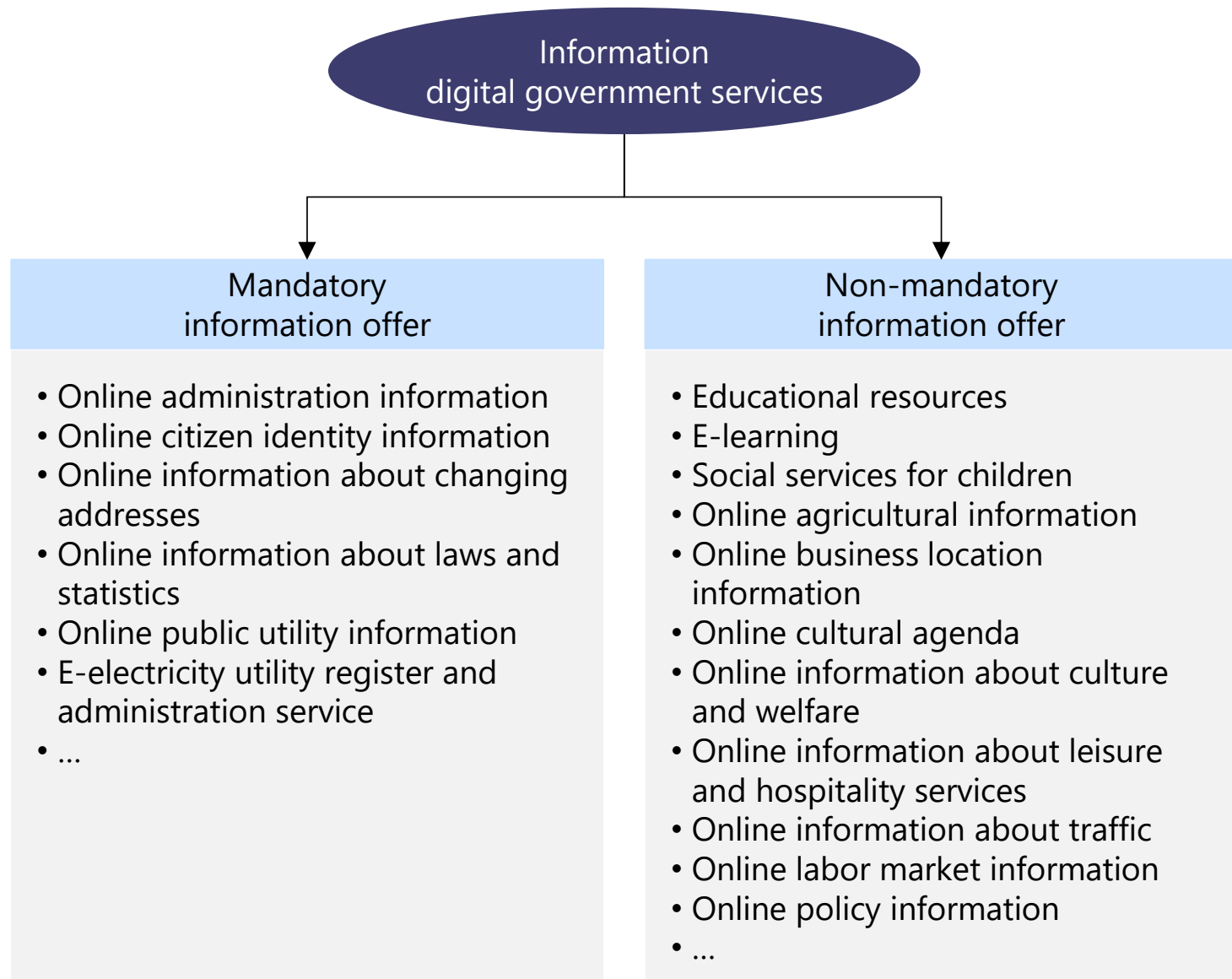


## Fig. 11.4 ICTI digital government business models with subcategories



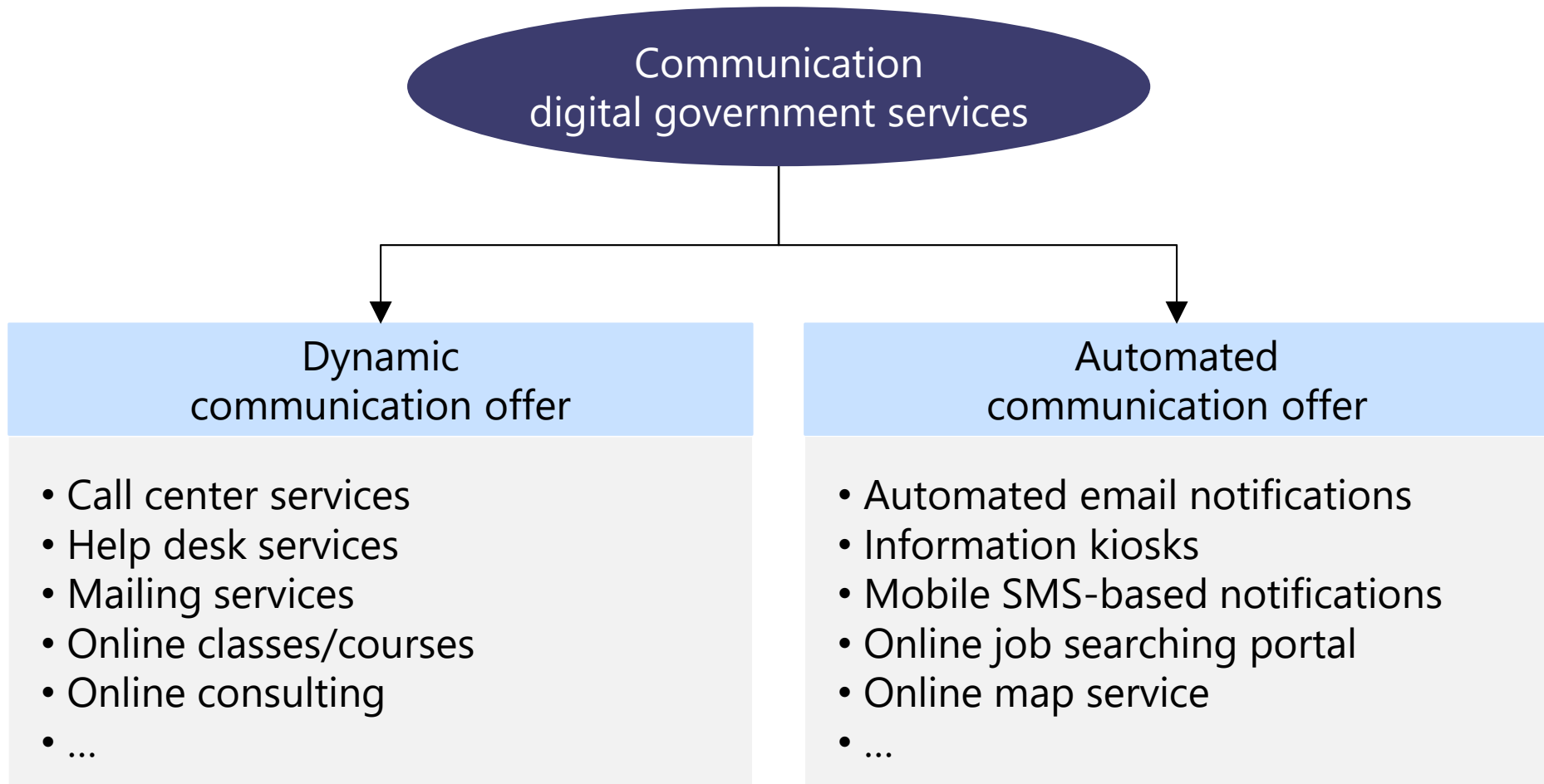
Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 11.5 Information digital government service (G2C)**



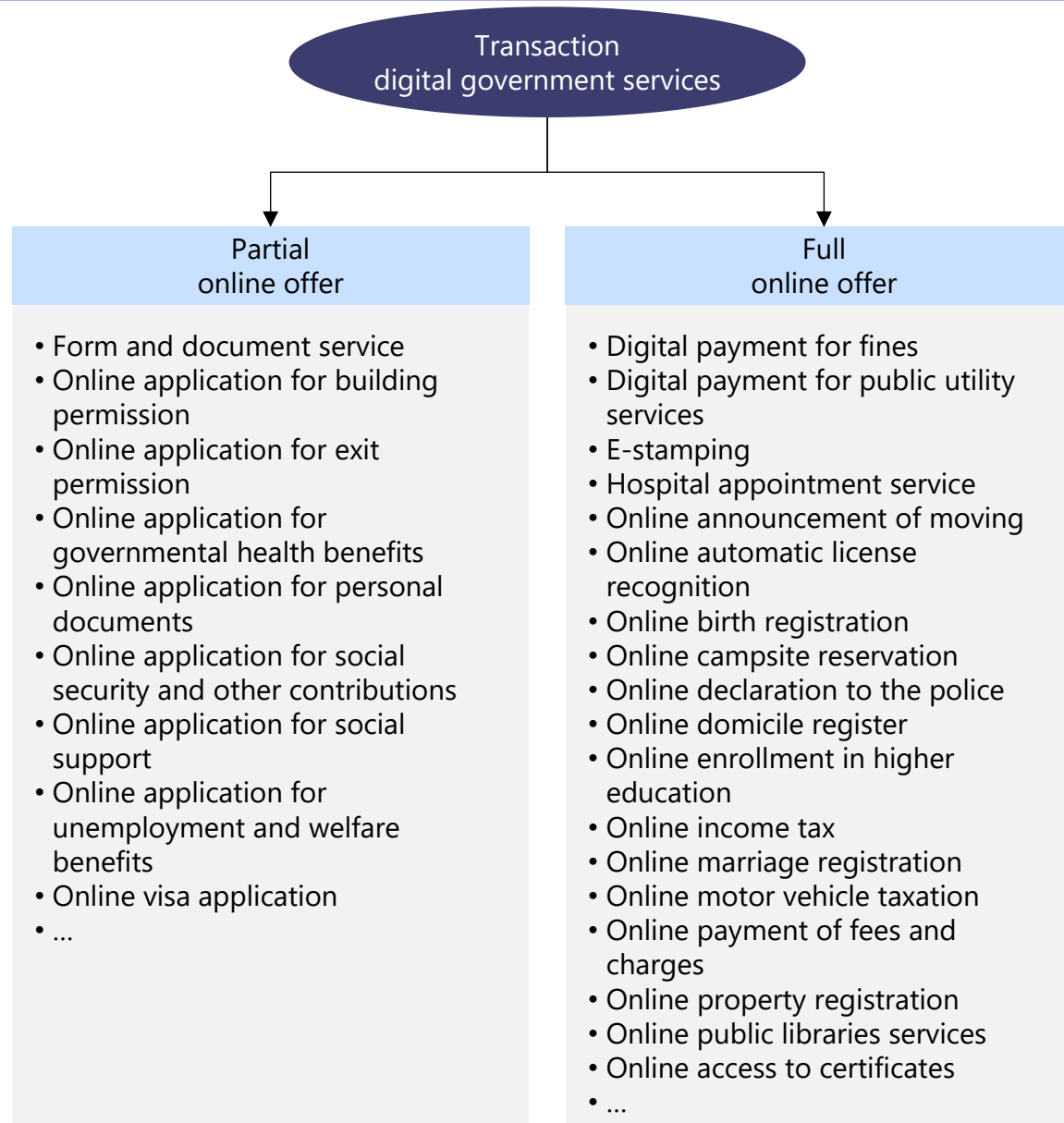
Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 11.6 Communication digital government service (G2C)**

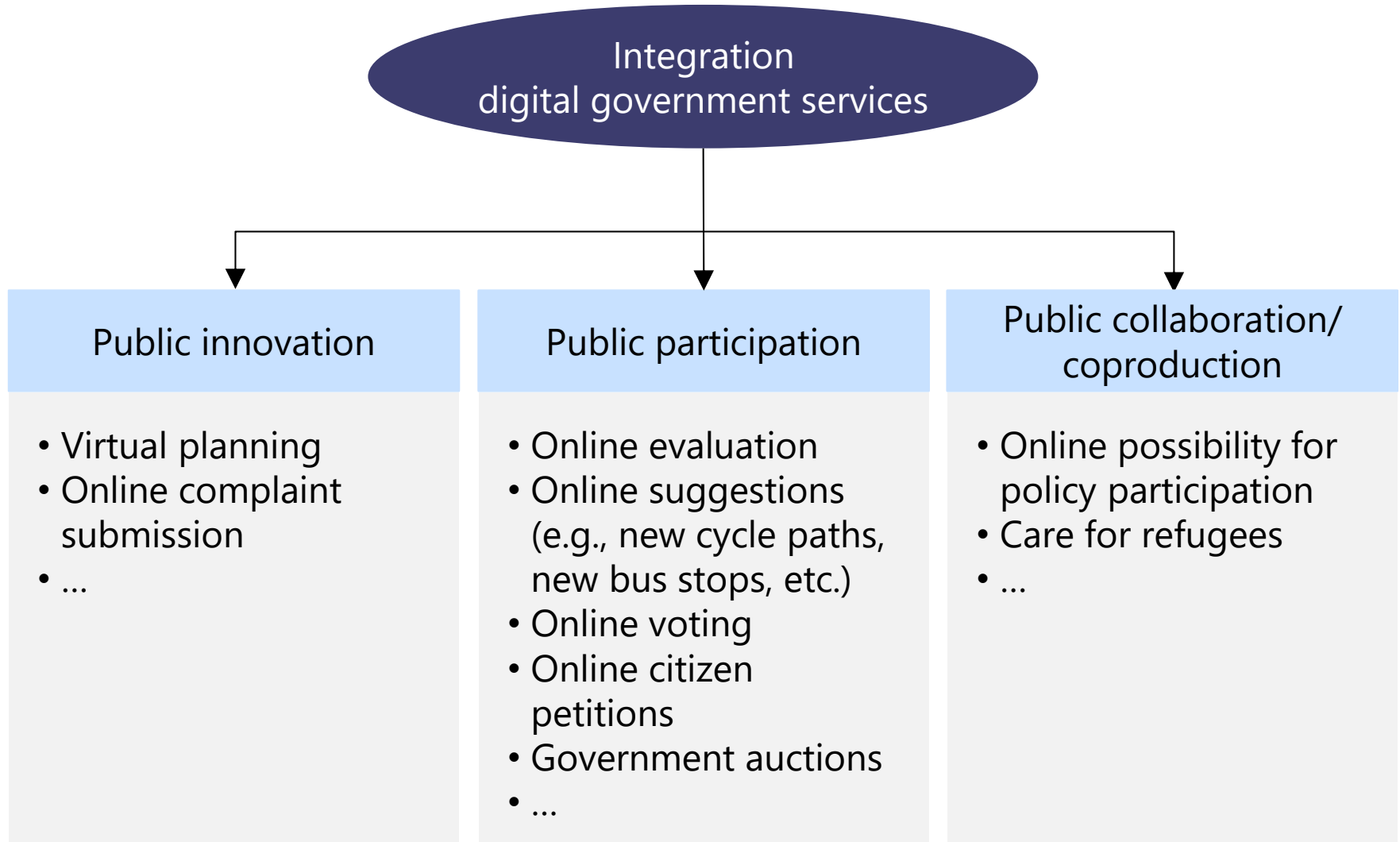


Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

## Fig. 11.7 Transaction digital government services (G2C)

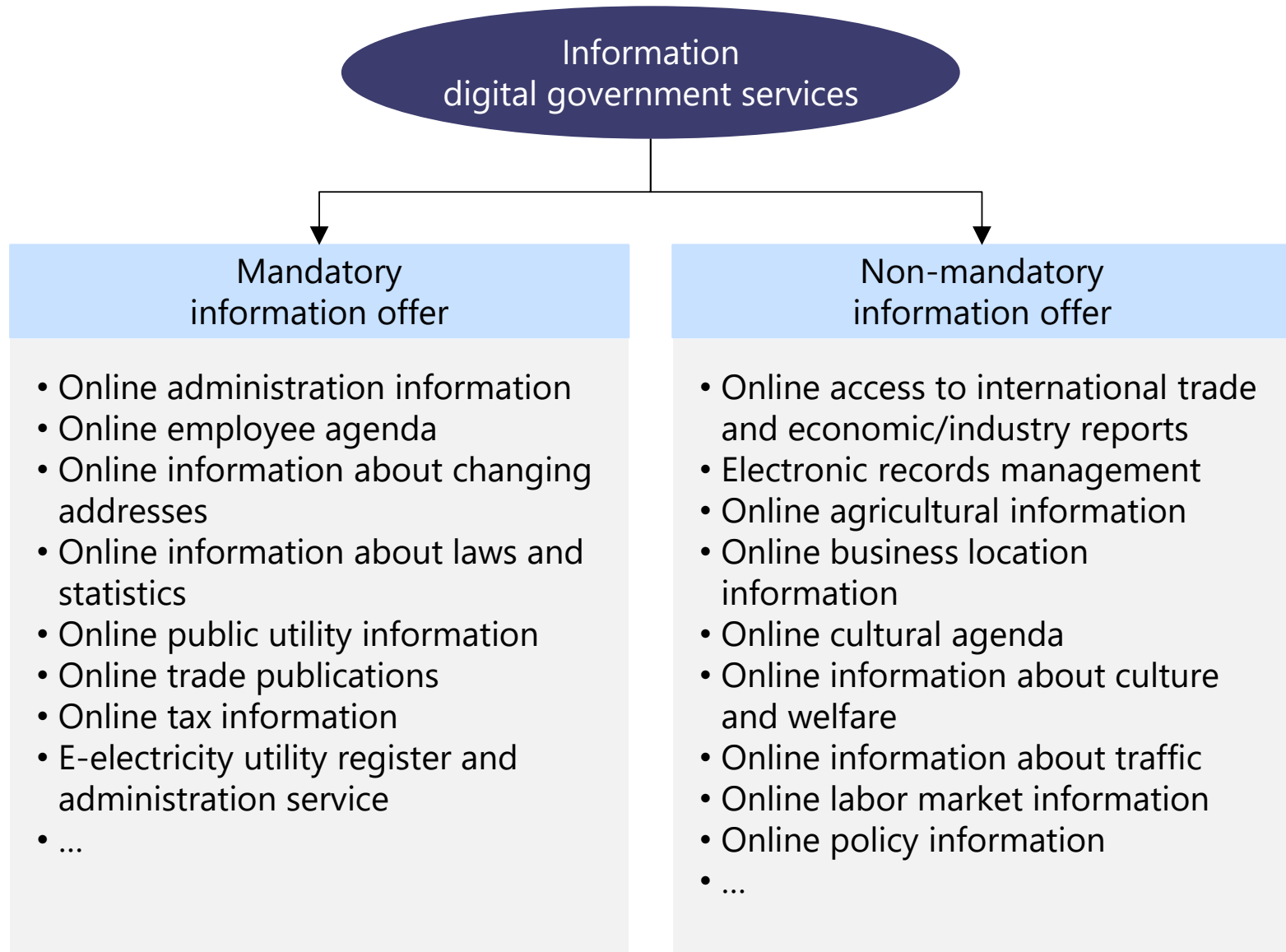


**Fig. 11.8 Integration digital government services (G2C)**



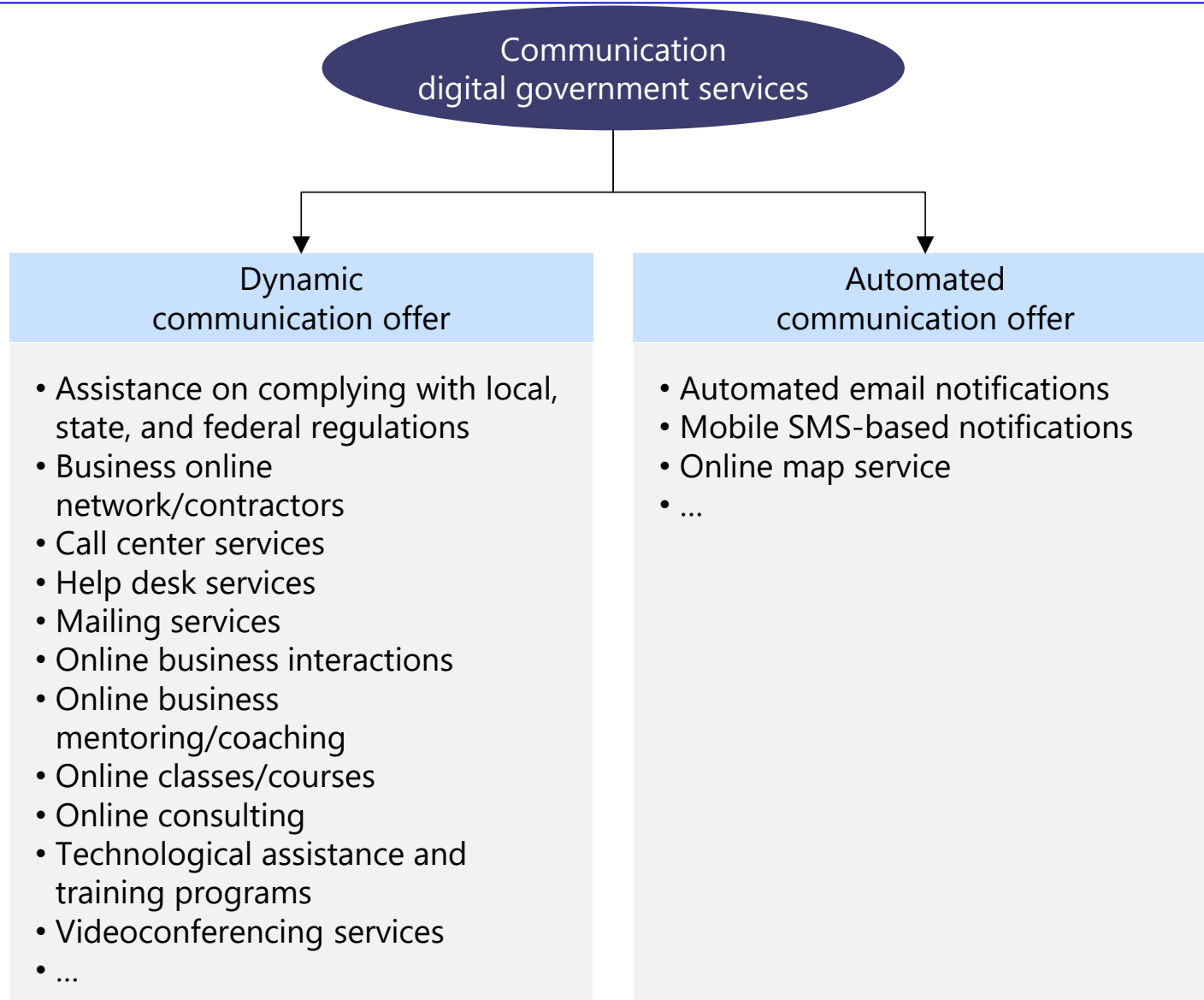
Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 11.9 Information digital government services (G2B)**



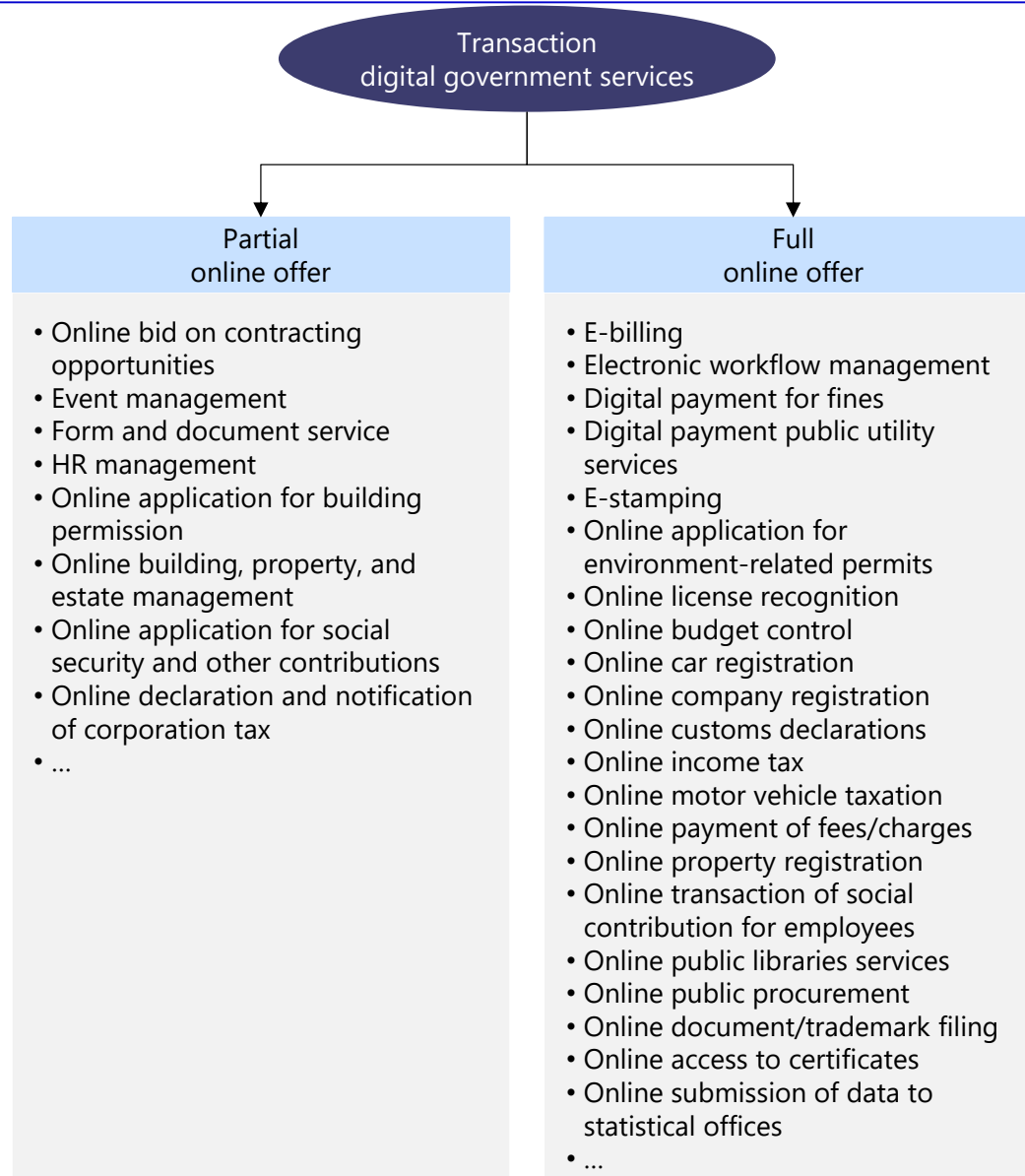
Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 11.10 Communication digital government services (G2B)**



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

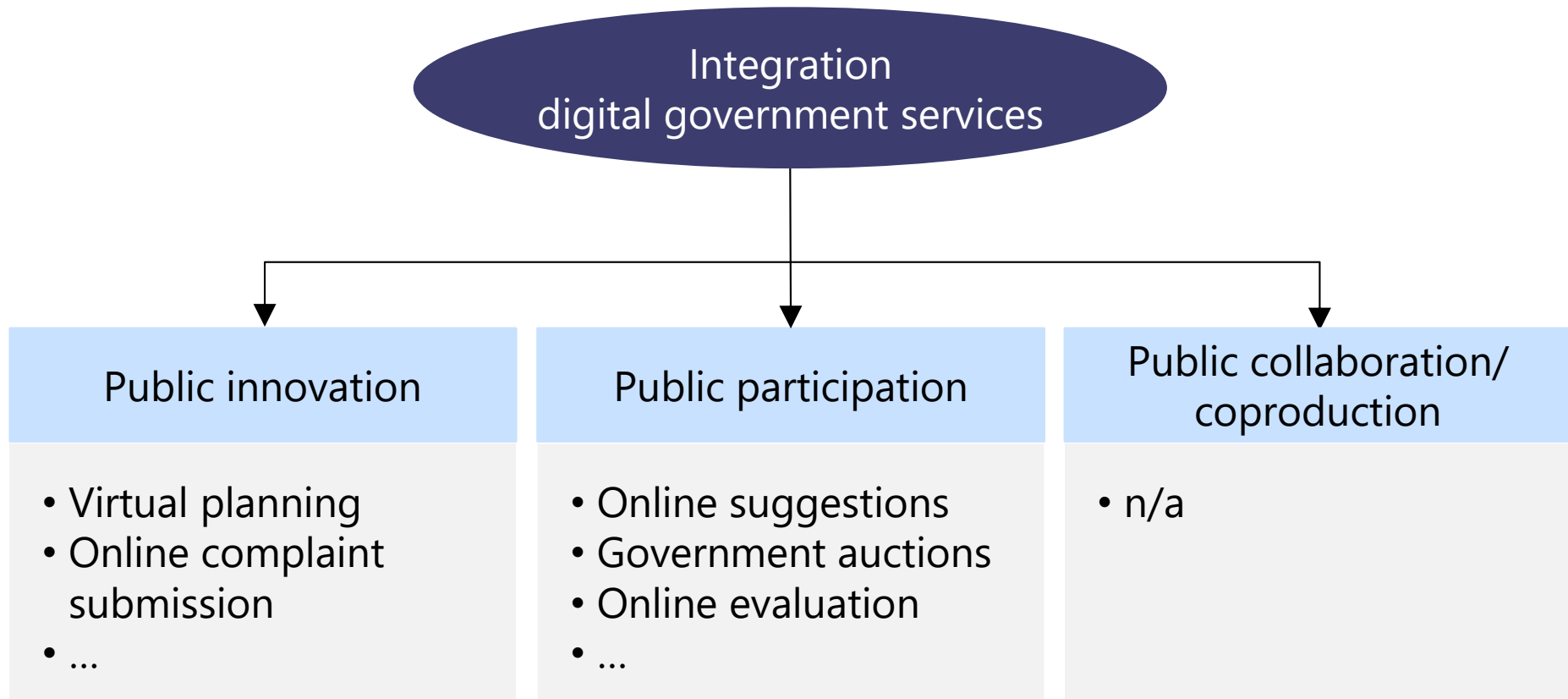
## Fig. 11.11 Transaction digital government services (G2B)



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)



**Fig. 11.12 Integrated digital government services (G2B)**



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

# Chapter 11

## Review questions, topics for discussion and online exercises

### Chapter 11

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Outline the digital government development stage model.
2. Illustrate the digital government interaction matrix.
3. Describe the schematic digital government actors and interaction structure.
4. Explain the ICTI digital government business models and their subcategories.
5. Outline in detail the main transaction services for users within the ICTI digital government business model. Provide an outline of these for the business context as well.



##### Topics for classroom discussion and team debates

1. Discuss why in many countries the development of digital government often remains in the field of information and communication and transaction and integration services are only offered to a limited extent. Two aspects in particular are relevant here: funding and implementation barriers, especially a bureaucratic administrative culture.
2. There are a variety of stakeholders in the field of digital government. Discuss to what extent they have conflicting objectives and how these can be resolved.
3. Discuss for your city which services are of particular interest to you and other citizens and whether they are associated with a high utility value. When discussing the digital government services of your city, also consider the extent to which the entire spectrum of services is offered in accordance with the ICTI digital government business models.



##### Online Exercises

1. Visit <https://digital-strategy.ec.europa.eu/en/policies/egovernment>. Discuss the advantages and disadvantages of cross-border availability of digital public services.
2. Go to [https://gds.blog.gov.uk/2021/05/20/government-digital-service-our-strategy-for-2021-2024/?utm\\_medium=referral&utm\\_source=gdsorgpage&utm\\_campaign=gdsstrategy](https://gds.blog.gov.uk/2021/05/20/government-digital-service-our-strategy-for-2021-2024/?utm_medium=referral&utm_source=gdsorgpage&utm_campaign=gdsstrategy). Look at the UK Government Digital Service mission and discuss whether the path and focus for this mission are effective and efficient.
3. Explore <https://www.usa.gov/> and look at the different types of services available.

# **Chapter 12: Multichannel E-Service Delivery**

# Definition of Multichannel System

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A multi-channel system exists when at least two different marketing channels are used to distribute products or services.

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Source: Wirtz (2008, 2021c, 2022)

# Definition of Multichannel Marketing

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Multichannel marketing is the process of planning, implementing and controlling all marketing activities in a multi-channel system. The aim is to achieve organizational goals by satisfying user needs in the long term.

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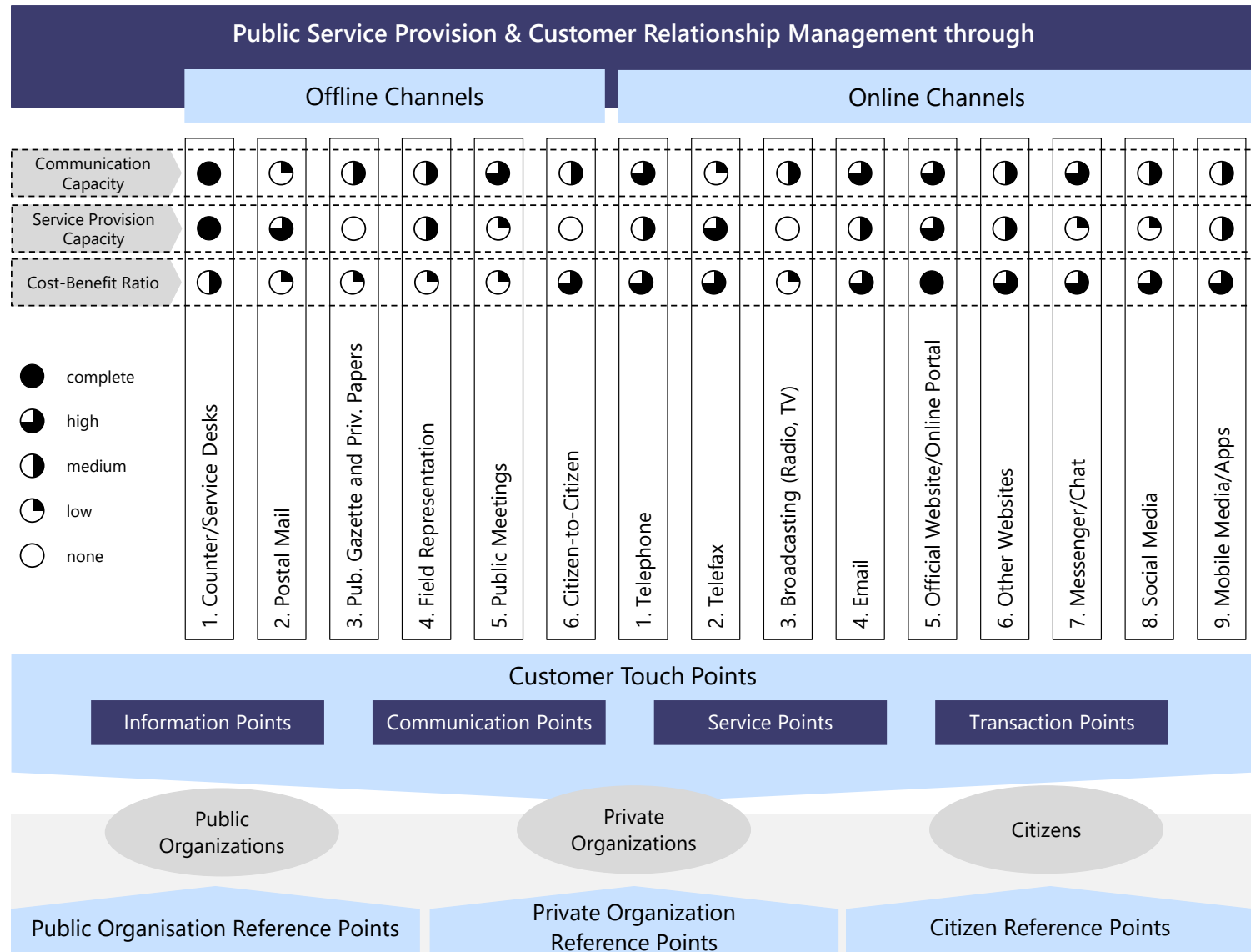
Source: Wirtz (2008, 2021c, 2022)

**Fig. 12.1 Service-channel diversification model (SCD model)**

		Channel widening/expansion		
		Same	Similar	New
Service expansion/channel deepening	Same	<b>I</b> Single-channel service penetration <ul style="list-style-type: none"> <li>• Application of one or similar services through one or similar channels</li> <li>• Example: Tax declarations can only be done at the counter</li> </ul>	<b>III</b> Lateral-channel service penetration <ul style="list-style-type: none"> <li>• Application of one or similar services through different channels</li> <li>• Example: Tax declarations can be done online as well as by mail and by fax</li> </ul>	
	Similar	<b>II</b> Single-channel service diversification <ul style="list-style-type: none"> <li>• Application of different services through one or similar channels</li> <li>• Example: Apart from tax declarations, the counter also offers other services (e.g., delivering compliance documents)</li> </ul>	<b>IV</b> Multilateral cross-service channel expansion <ul style="list-style-type: none"> <li>• Application of various services through multiple channels</li> <li>• Example: The revenue authorities offer multiple finance related services through counters, a web portal, etc.</li> </ul>	
	New			

Source: Wirtz and Daiser (2015), Wirtz (2013b, 2021b, 2022)

## Fig. 12.2 Public service delivery model



Source: Wirtz and Daiser (2015), Wirtz (2005a, 2021b, 2022)

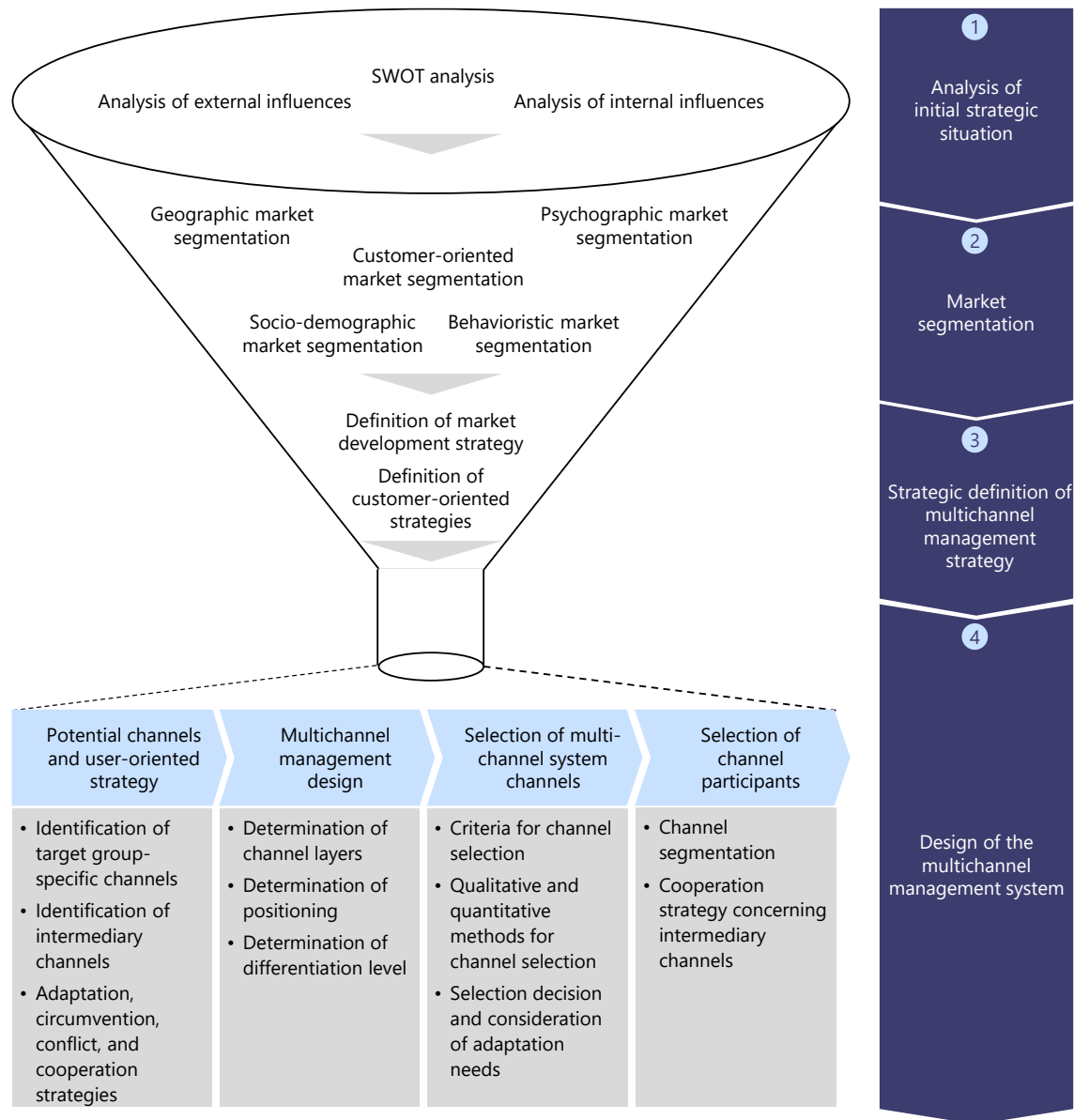
## Fig. 12.3 Strategic multichannel system

Approach Aspects	Isolated Channel Strategy	Combined Channel Strategy	Integrated Channel Strategy
Coordination	<ul style="list-style-type: none"><li>• Uncoordinated channels/ channel-inherent management</li><li>• Closed channel structure</li><li>• Channel competition</li></ul>	<ul style="list-style-type: none"><li>• Partially coordinated channels/channel-inherent management</li><li>• Loosely linked channel structure</li><li>• Channel competition</li></ul>	<ul style="list-style-type: none"><li>• Completely coordinated channels/comprehensive channel management</li><li>• Interdependent channel structure</li><li>• No competition between channels</li></ul>
Formation	<ul style="list-style-type: none"><li>• Lead channel structure</li><li>• Channel-specific management</li></ul>	<ul style="list-style-type: none"><li>• Mostly lead channel Structure</li><li>• Comprehensive channel management</li></ul>	<ul style="list-style-type: none"><li>• Multichannel structure</li><li>• Centralized overall channel management</li></ul>
Organization	<div><div><ul style="list-style-type: none"><li>• High individual responsibility</li><li>• Low coordination</li><li>• High decentralization</li></ul></div><div><ul style="list-style-type: none"><li>• High interdependence</li><li>• High coordination</li><li>• High centralization</li></ul></div></div>		

Source: Wirtz and Daiser (2015), Wirtz (2013b, 2021c, 2022)



# Fig. 12.4 Strategic multichannel management process



Source: Wirtz and Daiser (2015), Wirtz (2013c, 2021c, 2022)

# Chapter 12

## Review questions, topics for discussion and online exercises

### Chapter 12

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Define multichannel systems.
2. Describe the service-channel diversification model (SCD model).
3. Outline the public service delivery model and explain the channel evaluation.
4. Explain the public multichannel strategy framework.
5. Describe the strategic multichannel management process.



##### Topics for classroom discussion and team debates

1. Discuss the difficulties that public administrations have encountered/are encountering in transferring services from offline to online channels.
2. Discuss the respective advantages and disadvantages of online and offline channels from the citizens' perspective for your city. Consider the perspectives of the different groups of citizens (rich - poor, impaired - non-impaired, ...).
3. Discuss within the class whether a multichannel approach leads to more access fairness for different groups of citizens.

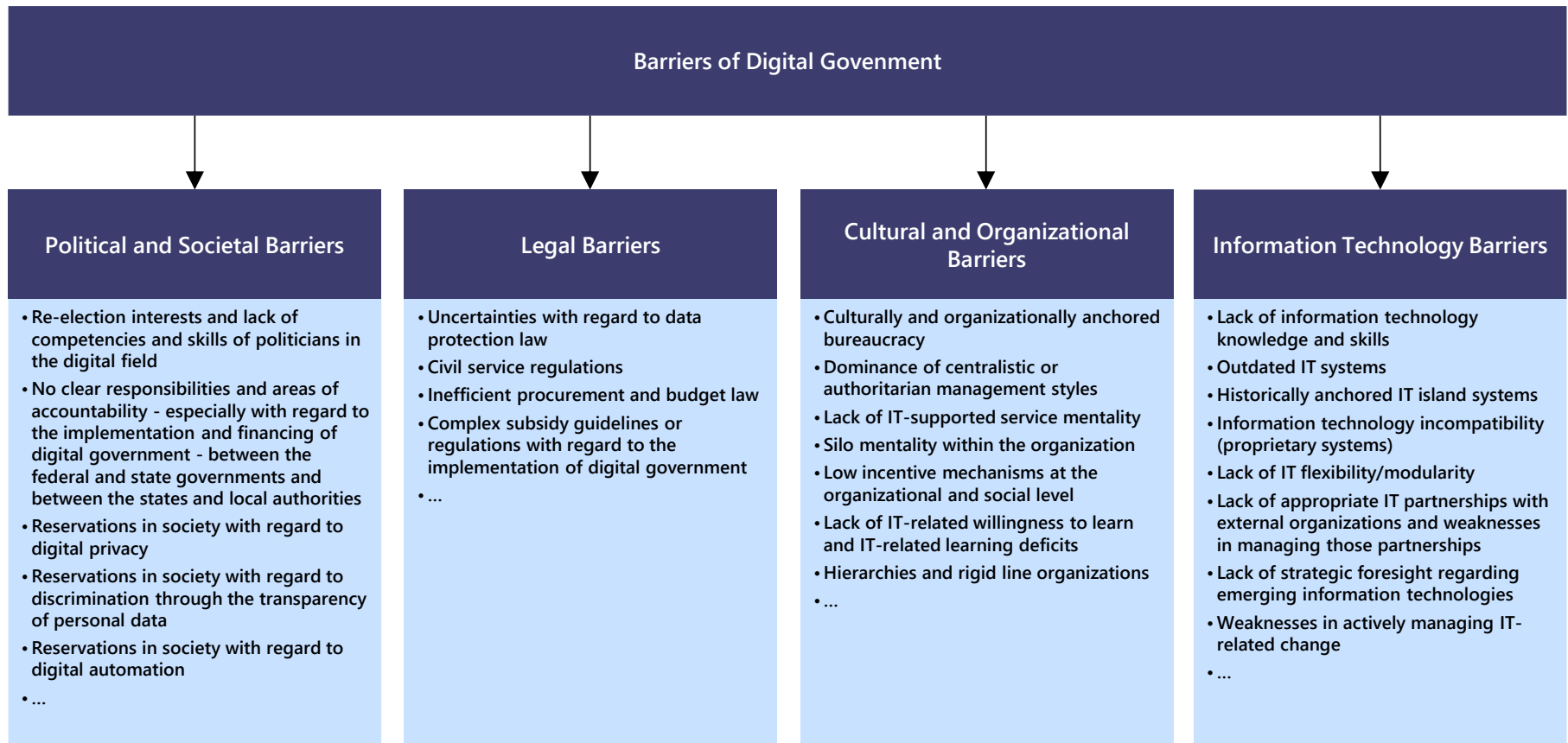


##### Online Exercises

1. Visit <https://about.healthdirect.gov.au/healthcares-future-is-consumer-focused-and-multichannel>. Work out the key points of multichannel healthcare in Australia. What trends are emerging?
2. Go to <https://digitaldenmark.dk/solutions/> and explore the site. What reasons led to the emergence of numerous public multichannel offerings in Denmark?
3. Enter [https://www.bahrain.bh/wps/portal/!ut/p/a0/hcrNCoJAEADgV\\_Gyx5gxSewoEYYXoYhsL7LJoJvrrD-j1NuHT9Dxgw80IKDZrLYxYj0bt1nH1aXAONwn-zyJ7hGmRXy6Hs8YZniAGzHk\\_1UJT\\_seR52Crj0LfQRKavw6-EmMq4gVtr4nheNi6y5wlrZozXn5RYLt0cQ9sSjsFyd2V7eGmVwww2SEmi8MXfb4AAQ91Ldcl/](https://www.bahrain.bh/wps/portal/!ut/p/a0/hcrNCoJAEADgV_Gyx5gxSewoEYYXoYhsL7LJoJvrrD-j1NuHT9Dxgw80IKDZrLYxYj0bt1nH1aXAONwn-zyJ7hGmRXy6Hs8YZniAGzHk_1UJT_seR52Crj0LfQRKavw6-EmMq4gVtr4nheNi6y5wlrZozXn5RYLt0cQ9sSjsFyd2V7eGmVwww2SEmi8MXfb4AAQ91Ldcl/) and explore the site. How can Bahrain's multichannel strategy be described?

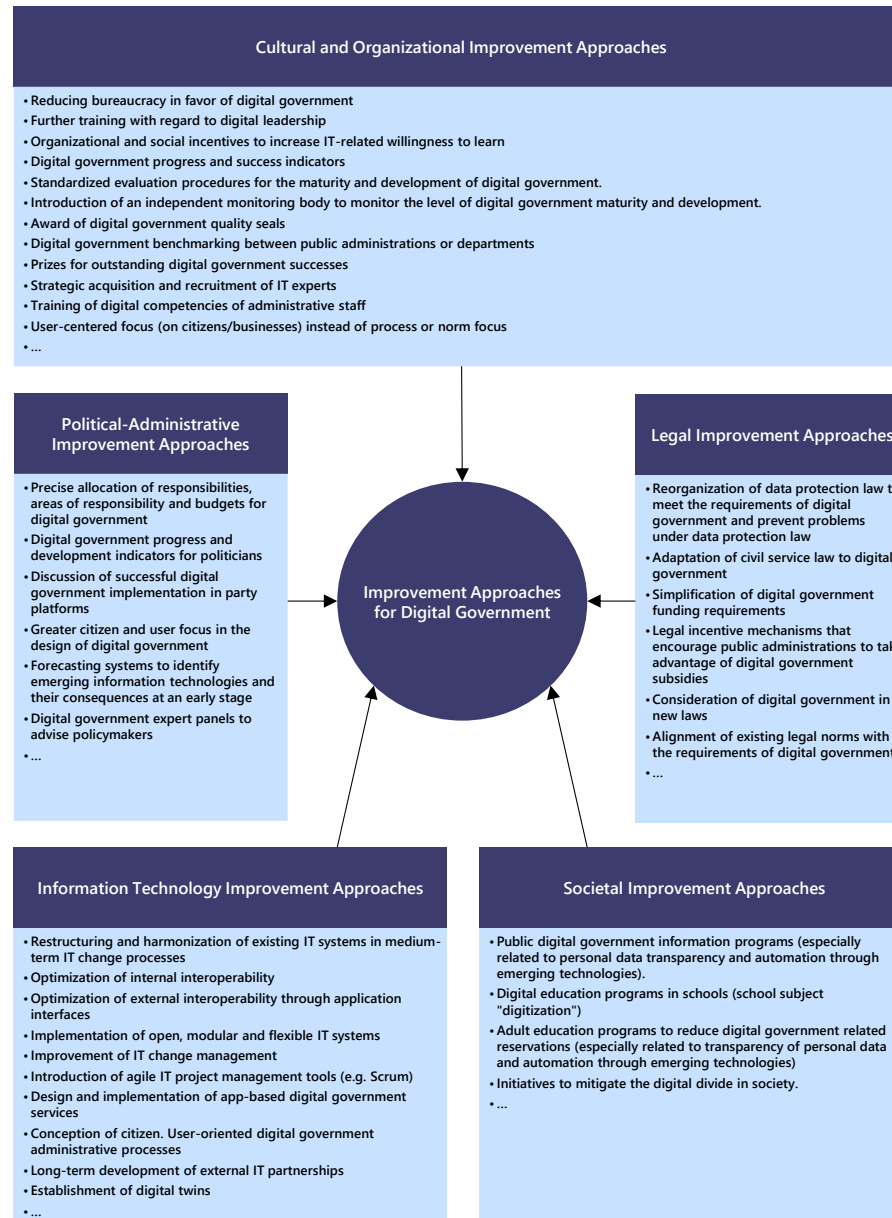
# **Chapter 13: Success Factors of Digital Government**

**Fig. 13.1 The four-barrier model of digital government**



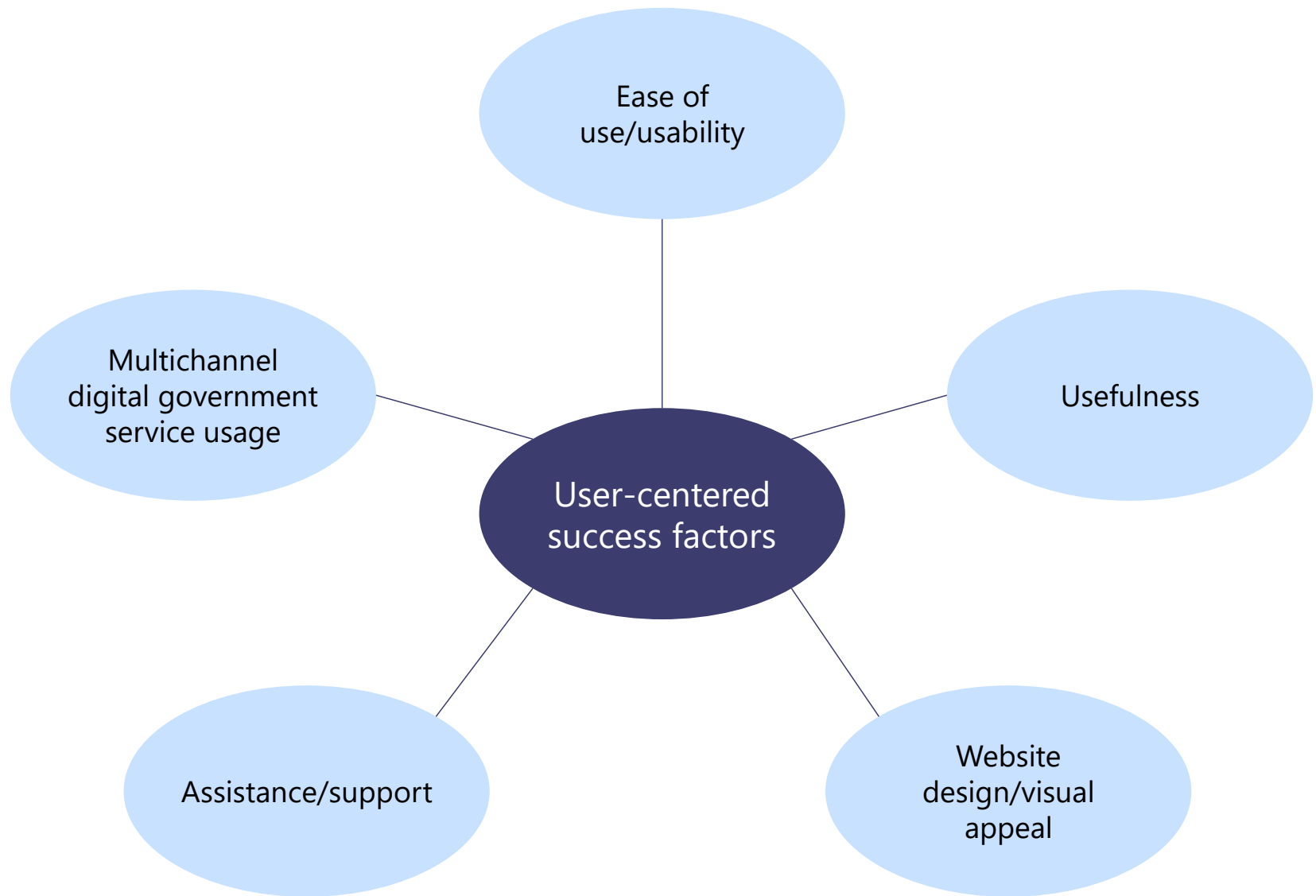
Source: Wirtz (2022)

# Fig. 13.2 The five-dimensional optimization model of digital government



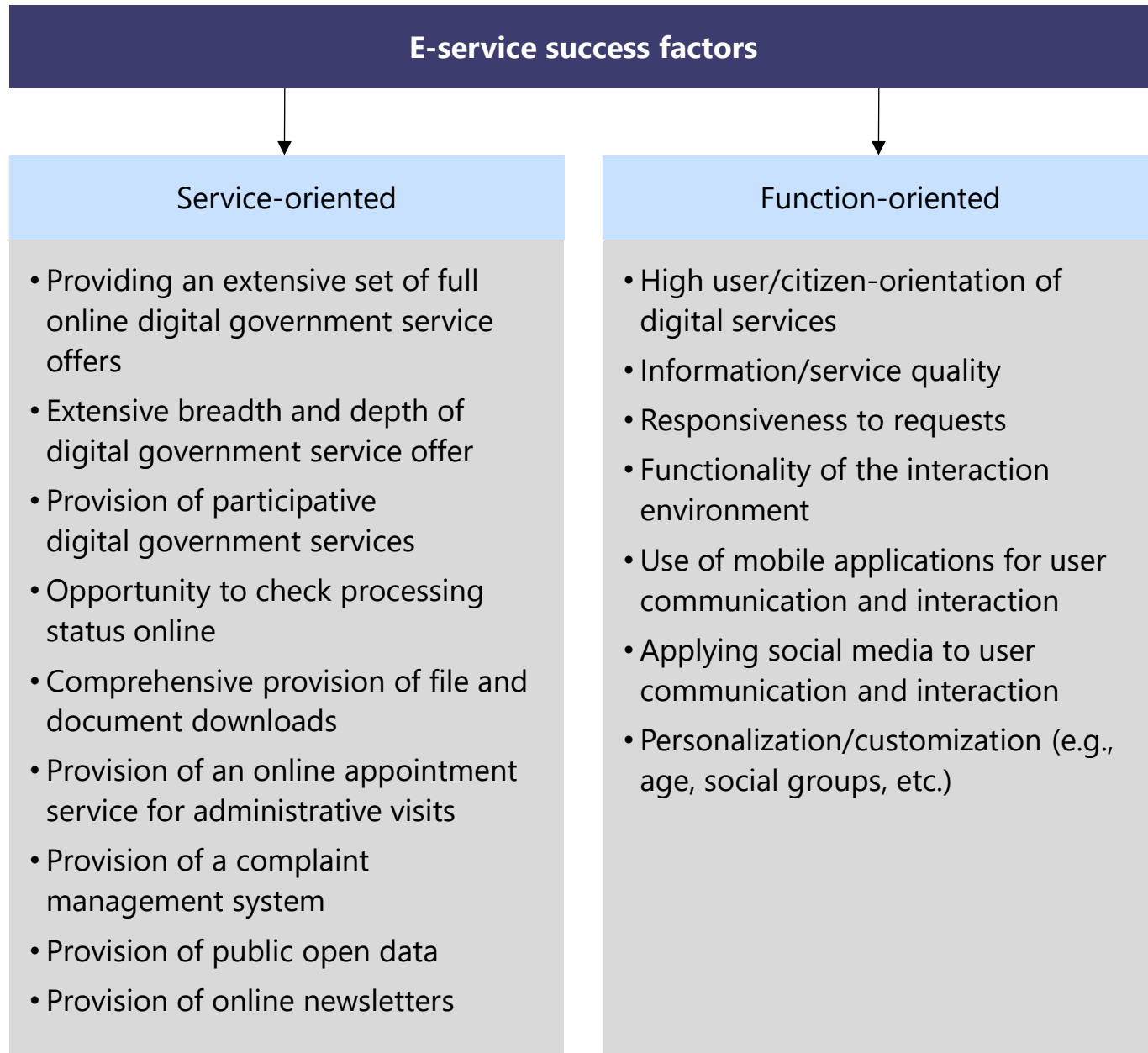
Source: Wirtz (2022)

**Fig. 13.3 User-centered success factors**

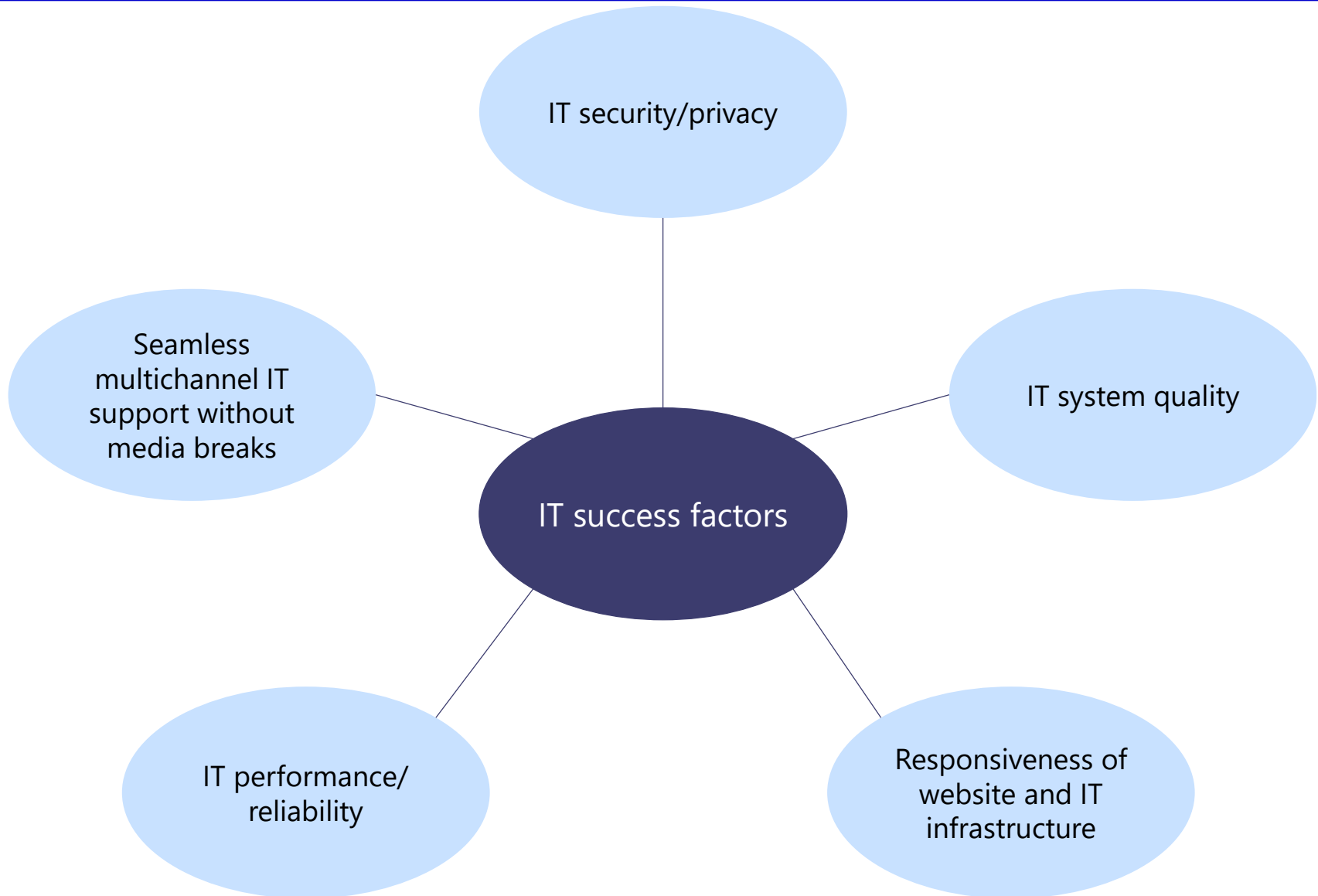


Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 13.4 E-services success factors**



**Fig. 13.5 IT success factors**



Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)



# Chapter 13

## Review questions, topics for discussion and online exercises

### Chapter 13

#### Review questions, topics for discussion and online exercises



#### Review questions

1. Present the four-barrier model of digital government.
2. Explain the five-dimension optimization model of digital government.
3. Describe the user-centric success factors of digital government.
4. Describe the service-centric success factors of digital government.
5. Outline the IT-related success factors of digital government.



#### Topics for classroom discussion and team debates

1. Discuss which of the digital government barriers are the biggest obstacle to digital government success.
2. Discuss whether we need digital government improvement approaches at all, and if so, why.
3. Discuss the digital government success factors using your city's website as an example. Are all success factors present there?

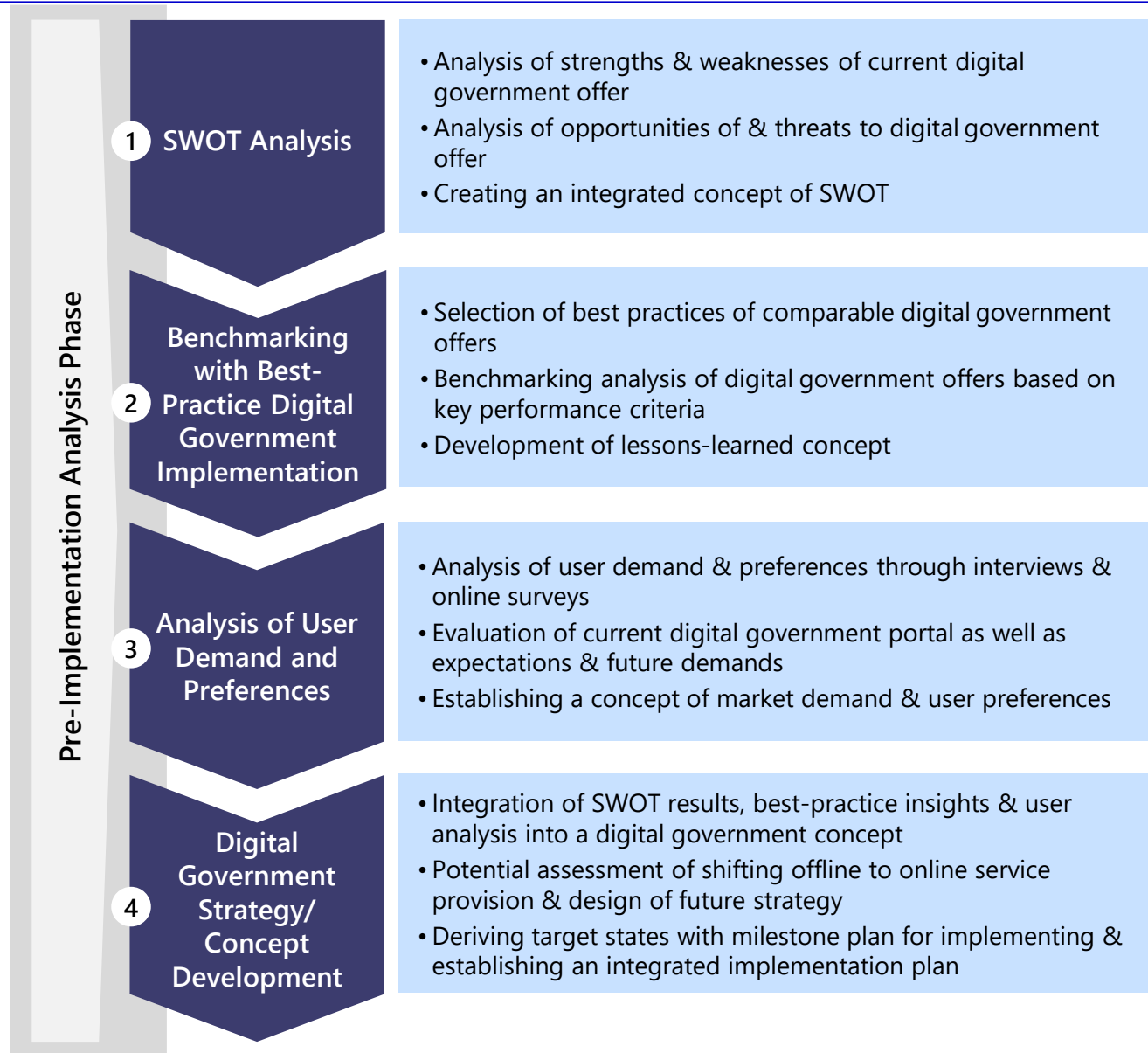


#### Online Exercises

1. Go to <https://www.cityoflondon.gov.uk/> and find out to what extent IT success factors can be identified. Are all of them present?
2. Visit <https://www.nyc.gov/> and work out where service-oriented success factors can be found. Are all of them present?
3. Enter <https://www.gov.sg/> and work out where function-oriented success factors can be found. Are all of them present?

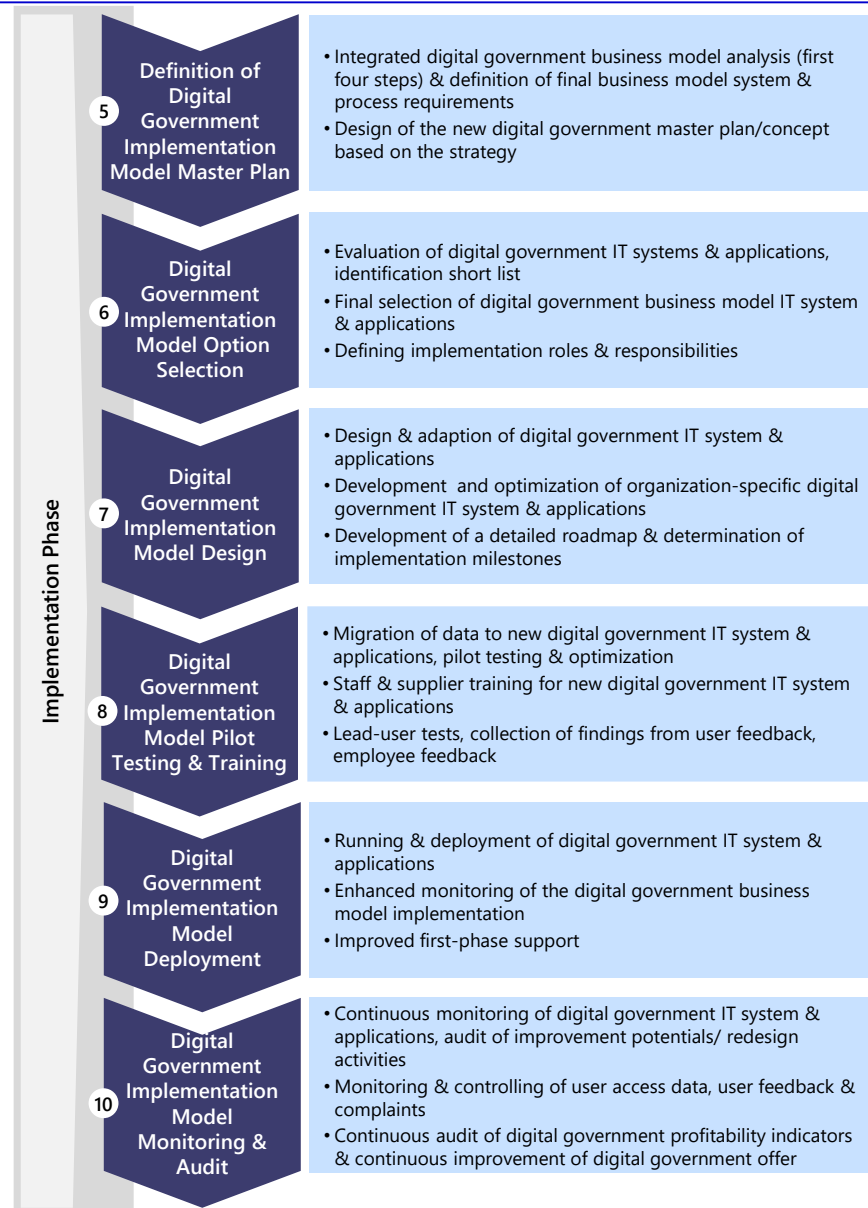
# **Chapter 14: Digital Government Implementation**

## Fig. 14.1 Pre-implementation analysis phase



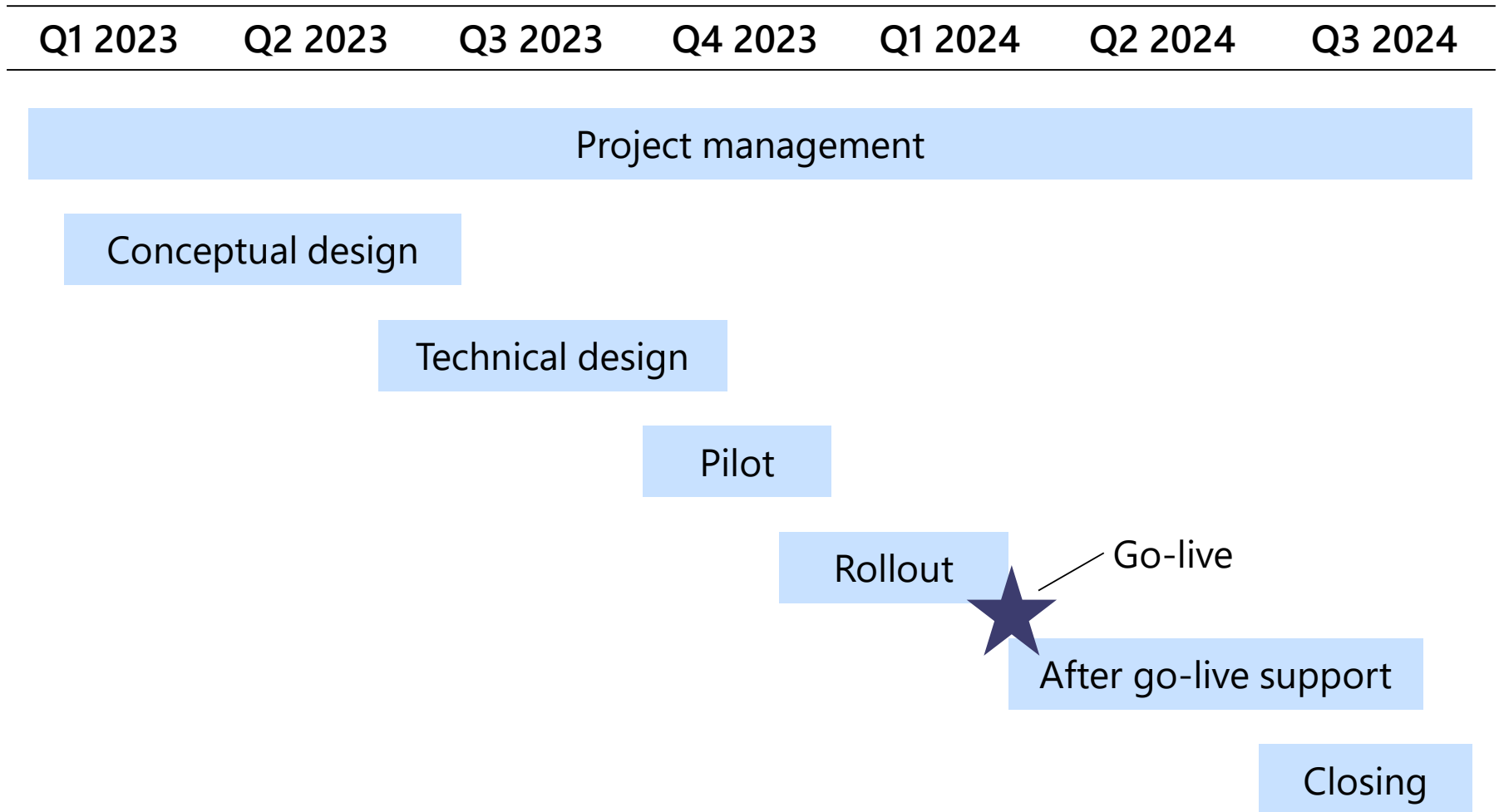
Source: Wirtz (2021b, 2022)

## Fig. 14.2 Implementation phase



Source: Wirtz (2021b, 2022)

**Fig. 14.3 Exemplary digital government implementation plan**



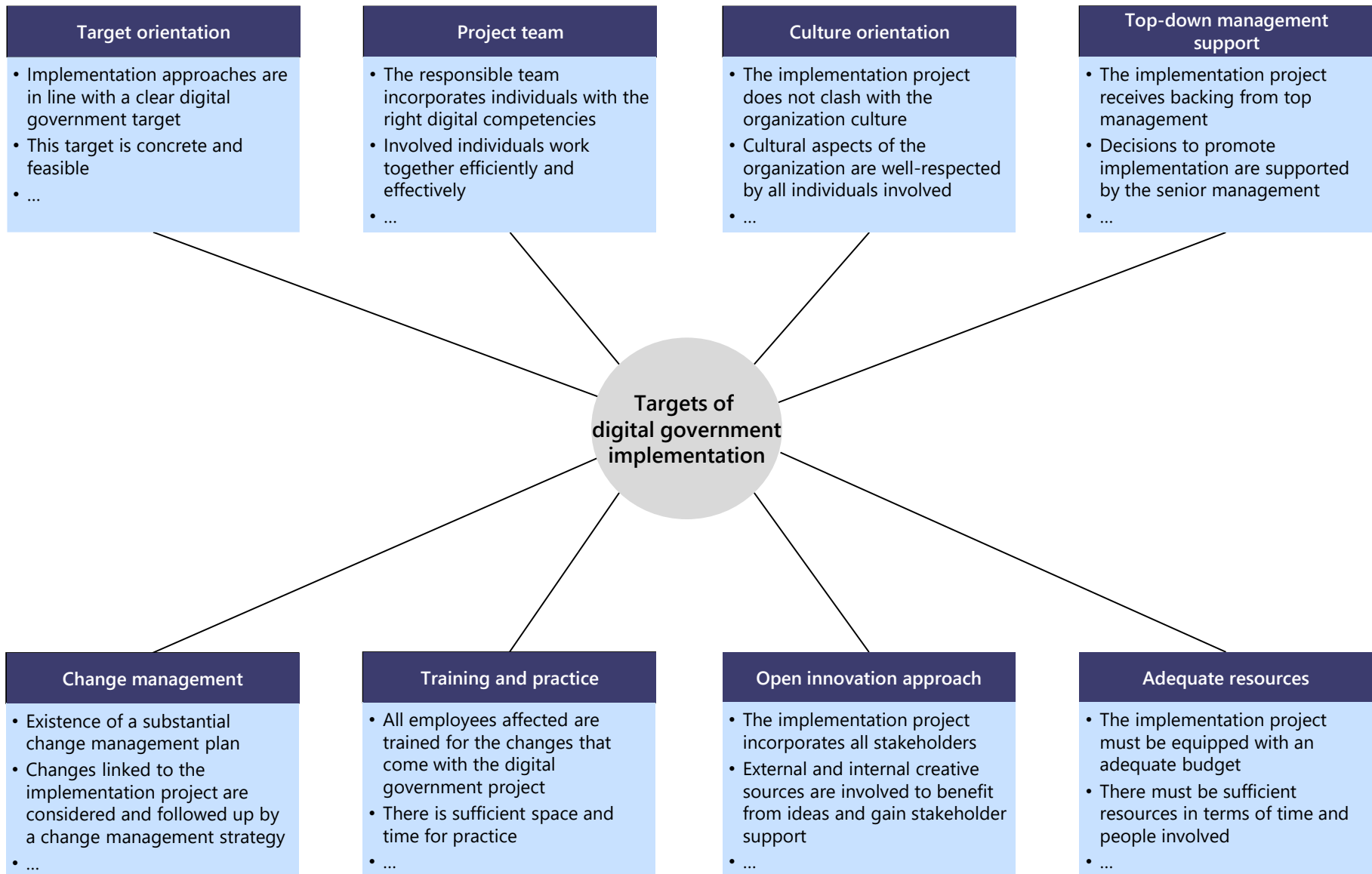
Source: Wirtz (2010, 2021b, 2022)

# Fig. 14.4 10-steps of digital government implementation roadmap



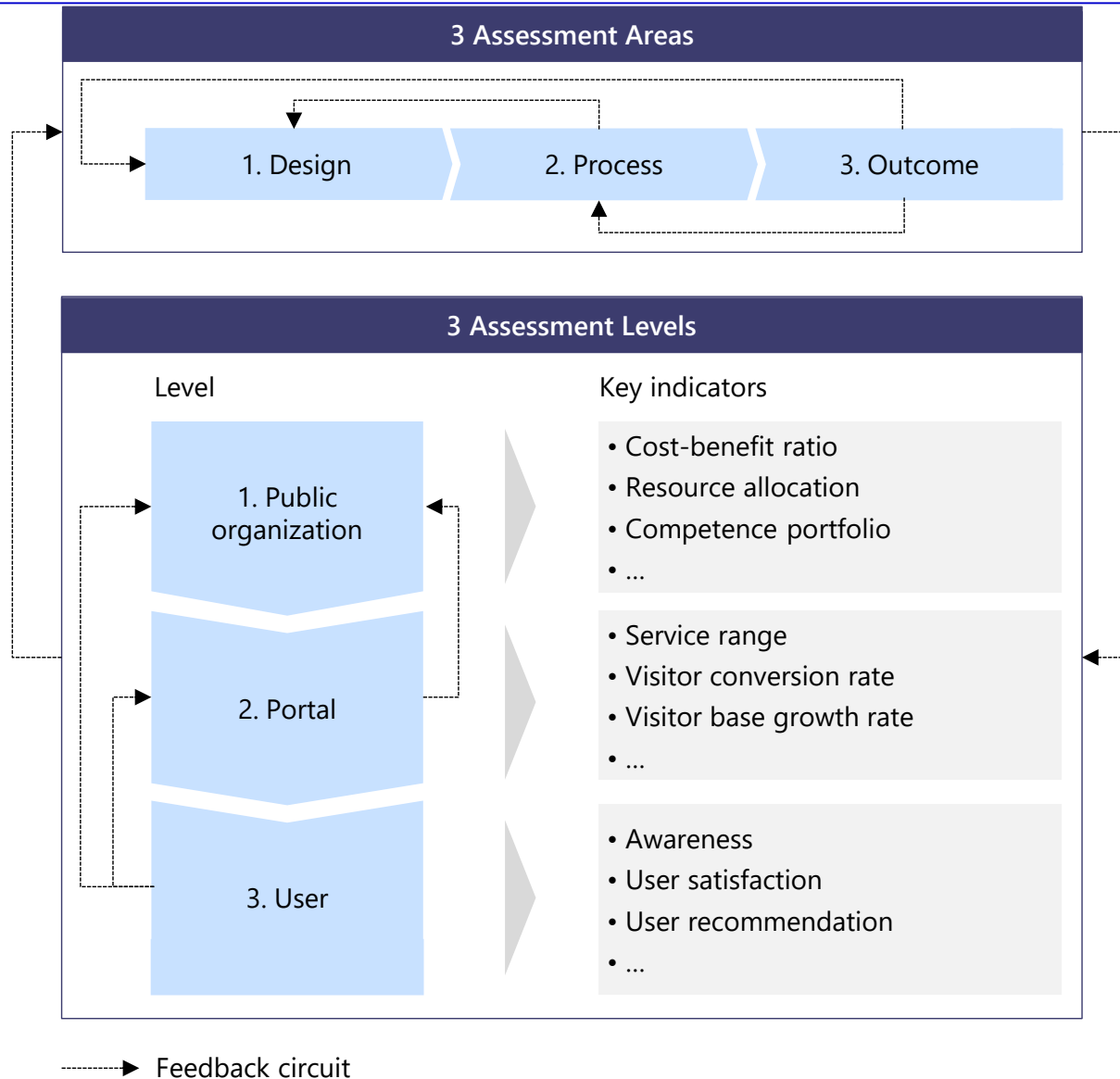
Source: Wirtz (2021b, 2022)

## Fig. 14.5 Success Factors of digital government implementation



Source: Wirtz (2021b, 2022)

## Fig. 14.6 Digital government 3+3 audit and evaluation system



Source: Wirtz and Daiser (2015), Wirtz (2021b, 2022)



# Chapter 14

## Review questions, topics for discussion and online exercises

### Chapter 14

#### Review questions, topics for discussion and online exercises



##### Review questions

1. Explain all four phases of the pre-implementation analysis phase model.
2. Describe all of the six implementation phases of the implementation phase model.
3. Name some of the key targets of a successful digital government implementation according to the targets of digital government implementation model.
4. Describe the three assessment areas and the associated feedback loops of the digital government 3+3 audit and evaluation system model.
5. Explain the three levels of assessment of the digital government 3+3 audit and evaluation system model and identify relevant key indicators.



##### Topics for classroom discussion and team debates

1. Discuss whether an implementation phase always requires a pre-implementation analysis phase. What are the advantages and disadvantages of a pre-implementation analysis phase for successful implementation?
2. Discuss whether the five phases of implementation must necessarily be carried out in the described manner and which are particularly important for ensuring implementation success.
3. Discuss to what extent the 3+3 system covers all relevant monitoring and audit areas that are important for implementation and whether, in your opinion, relevant ones are missing.



##### Online Exercises

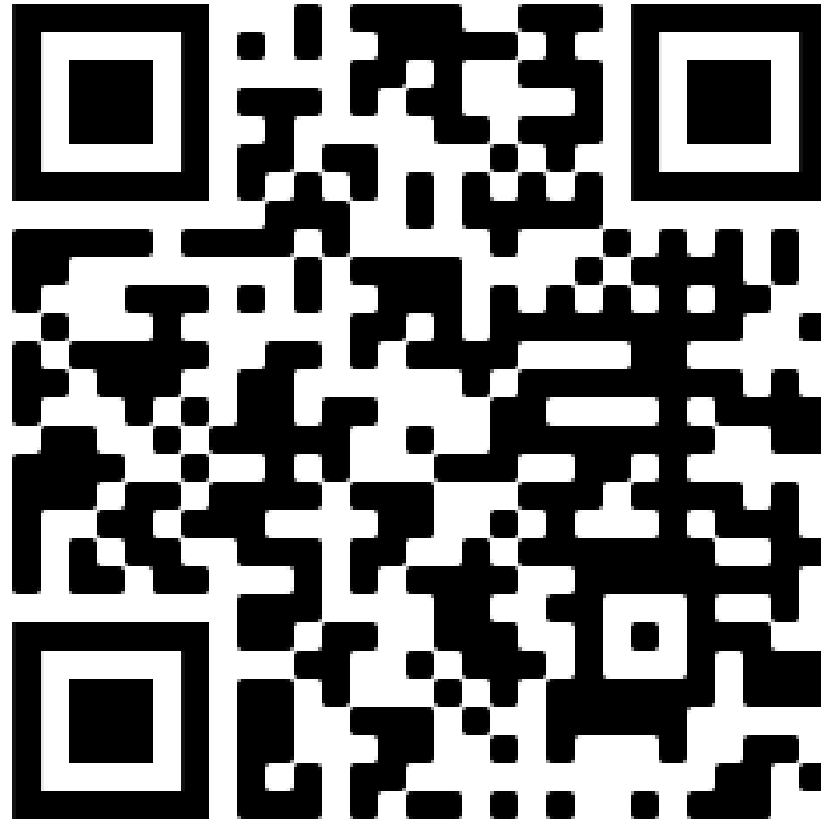
1. Visit [https://read.oecd-ilibrary.org/governance/benchmarking-digital-government-strategies-in-mena-countries\\_9789264268012-en#page1](https://read.oecd-ilibrary.org/governance/benchmarking-digital-government-strategies-in-mena-countries_9789264268012-en#page1). What can you learn from these examples with regard to Step 2 Benchmarking? In which areas does benchmarking take place in this study? Are these areas conclusive, or what other areas might be important for benchmarking in the digital government context?
2. Enter <https://www.canada.ca/en/government/system/digital-government/government-canada-digital-operations-strategic-plans/digital-operations-strategic-plan-2021-2024.html#toc04#> and look at Appendix D "Progress report on 2018-2022 DOSP strategic actions." Which of the 10 steps of digital government implementation can you identify in the list? Discuss whether the Canadian government's approach is reasonable.
3. Explore <https://www.nao.org.uk/sector/digital-government>. According to the digital government 3+3 audit and evaluation system model, are all assessment areas and assessment levels addressed? Which areas or levels are falling short?

## **Part IV: Digital Government Cases and Outlook**

# **Chapter 15: Digital Government Case Studies**

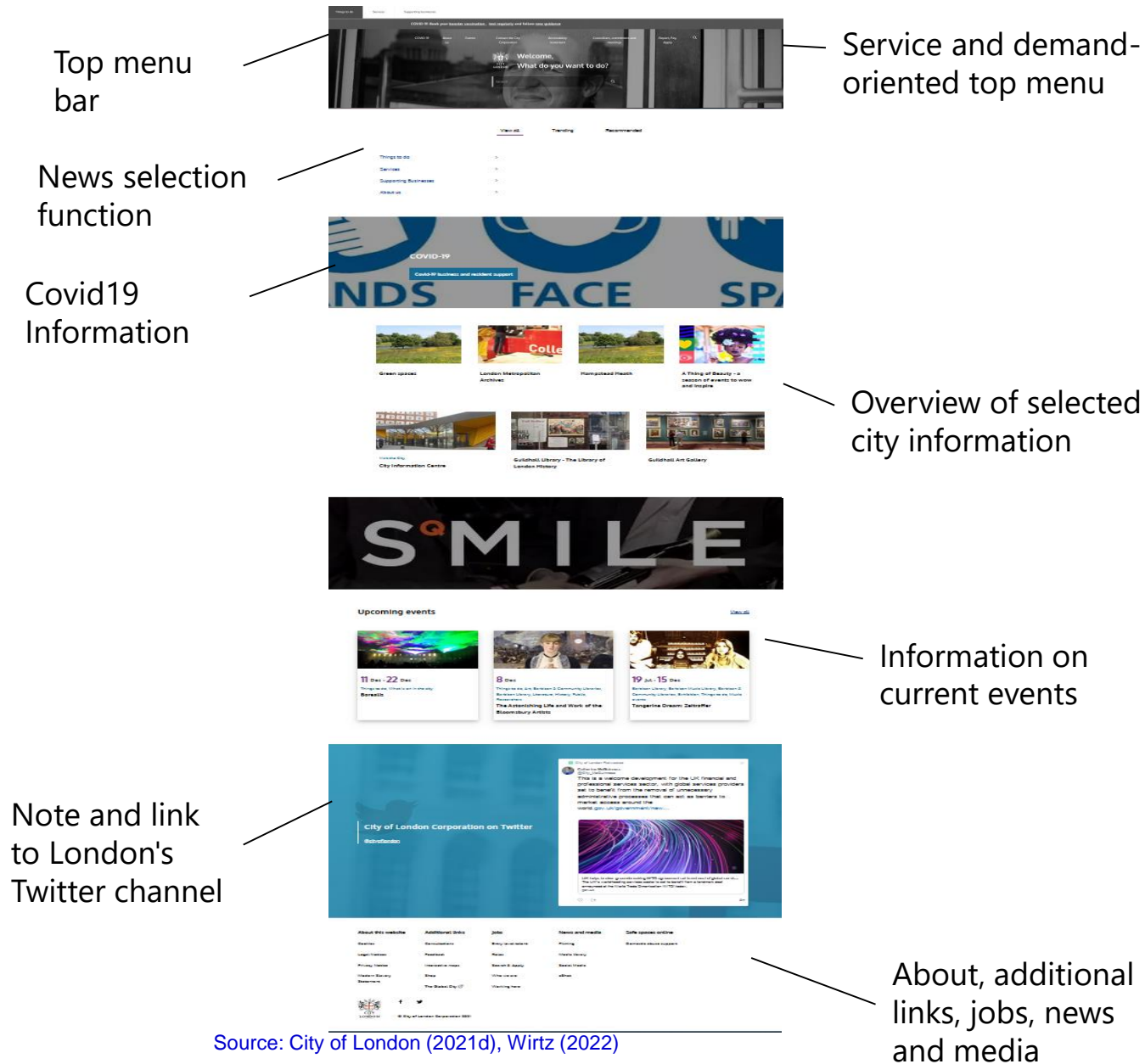
**Fig. 15.1 QR-Code to visit London's official website**

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Source: Wirtz (2022)

# Fig. 15.2 Landing Page of the City of London Portal

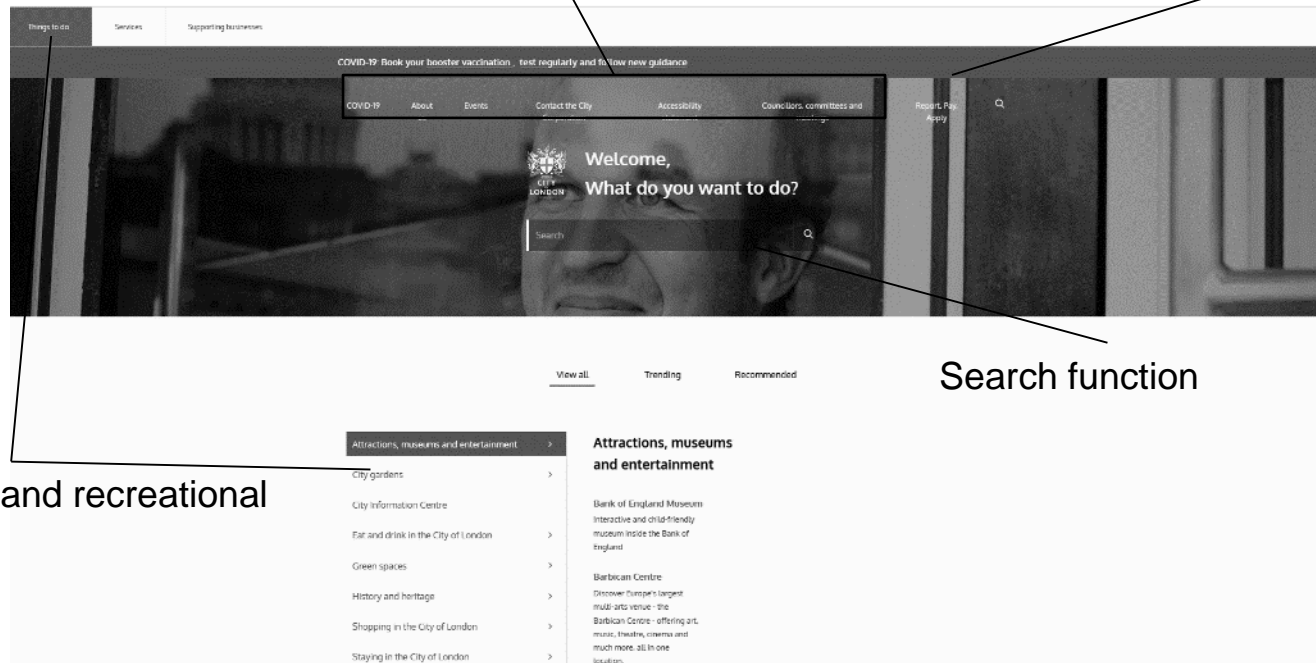


Source: City of London (2021d), Wirtz (2022)

## Fig. 15.3 First and Second Menu Bar at the Top of the Portal

Service and demand-oriented top menu

Direct link to reporting, payment and application services as well as login area



Search function

Access to cultural and recreational activities (parks, venues, art...)

Source: City of London (2021c), Wirtz (2022)

## Fig. 15.4 Key Insights from the [cityoflondon.gov.uk](https://cityoflondon.gov.uk) Digital Government Offering

### [cityoflondon.gov.uk](https://cityoflondon.gov.uk) digital government key insights

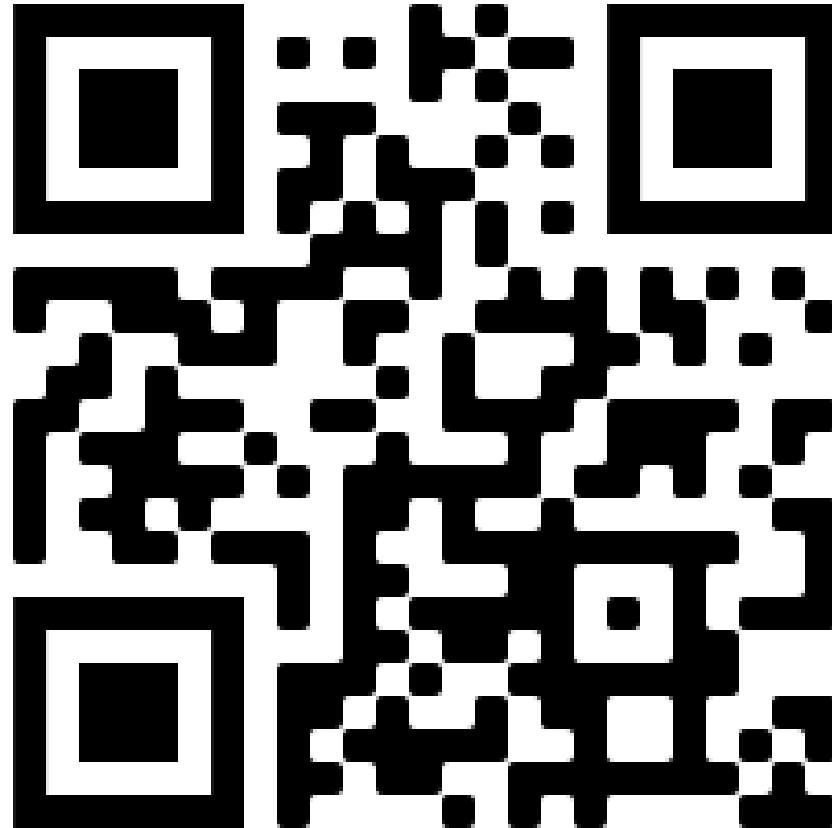
- Search-oriented structure of the digital government portal
- Offering several menu bars that guide the visitor
- Provision of a personalized user account, which is required for particular transactions and supports customized digital government access
- Prominent position of most popular links at the top of the website
- Broad range of useful information and services
- Innovative full online digital payment system
- Comparably little integration of mobile solutions

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Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 15.5 QR-Code to visit New York City's official website 311**

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Source: Wirtz (2022)



## Fig. 15.6 Key Insights from the nyc.gov Digital Government Offering

### **nyc.gov digital government key insights**

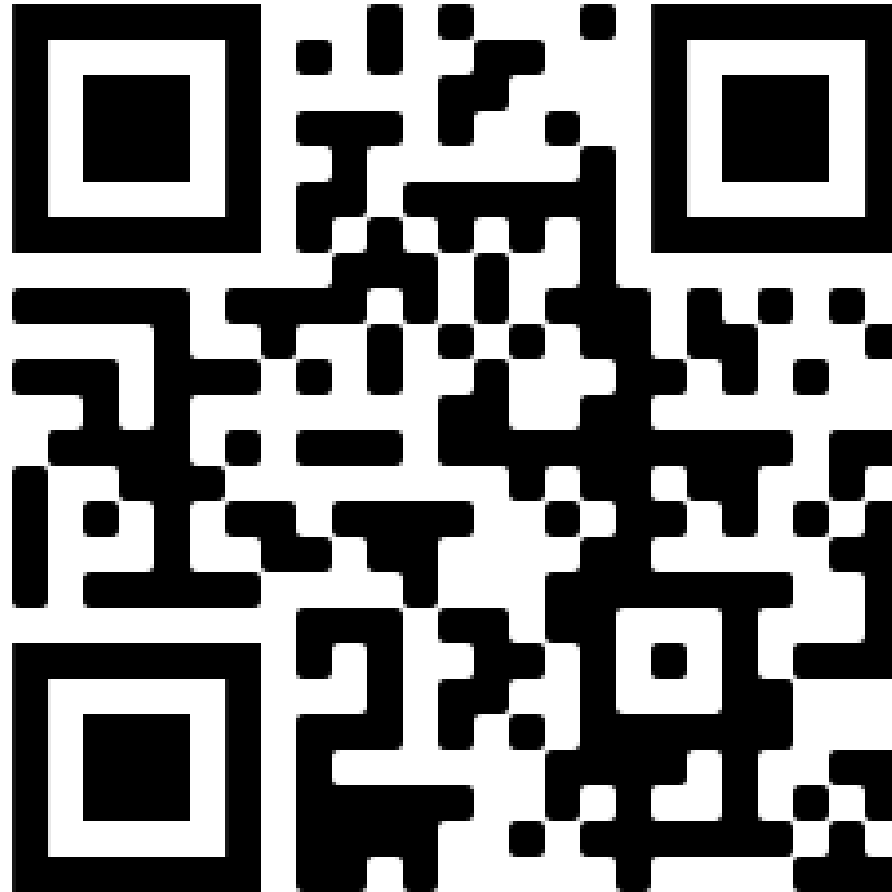
- Very broad range of useful information that is provided on the portal
- High availability of services, especially full online services, that are centrally available through the digital government portal
- Extensive provision of highly developed, interactive services
- Provision of participative services and suggestion systems
- Innovative full online digital payment system
- Far-reaching complaint and satisfaction management, which is directly presented at the landing page
- Very strong presence in social media channels. In total, nyc.com uses 340 social media channels

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Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

**Fig. 15.7 QR-Code to visit Hong Kong's official digital government portal**

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Source: Wirtz (2022)

## Fig. 15.8 Key Insights from the gov.hk Digital Government Offering

### cityoflondon.gov.uk digital government key insights

- Search-oriented structure of the digital government portal
- Offering several menu bars that guide the visitor
- Provision of a personalized user account, which is required for particular transactions and supports customized digital government access
- Prominent position of most popular links at the top of the website
- Broad range of useful information and services
- Innovative full online digital payment system
- Comparably little integration of mobile solutions

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Source: Wirtz and Daiser (2015, 2017b), Wirtz (2022)

# Chapter 15

## Review questions, topics for discussion and online exercises

### Chapter 15

#### Review questions, topics for discussion and online exercises



#### Review questions

1. Describe the London city portal in terms of its service offering structure.
2. Describe the New York city portal in terms of its service offering structure.
3. Describe the Hong Kong city portal in terms of its service offering structure.
4. Outline the key insights of the three case studies.



#### Topics for classroom discussion and team debates

1. Compare the three case studies. Discuss differences and similarities.
2. Discuss international differences in city portals. Evaluate the importance of adapting city portals to the regional culture.
3. Based on the three case studies, develop a draft for a city portal in your hometown.

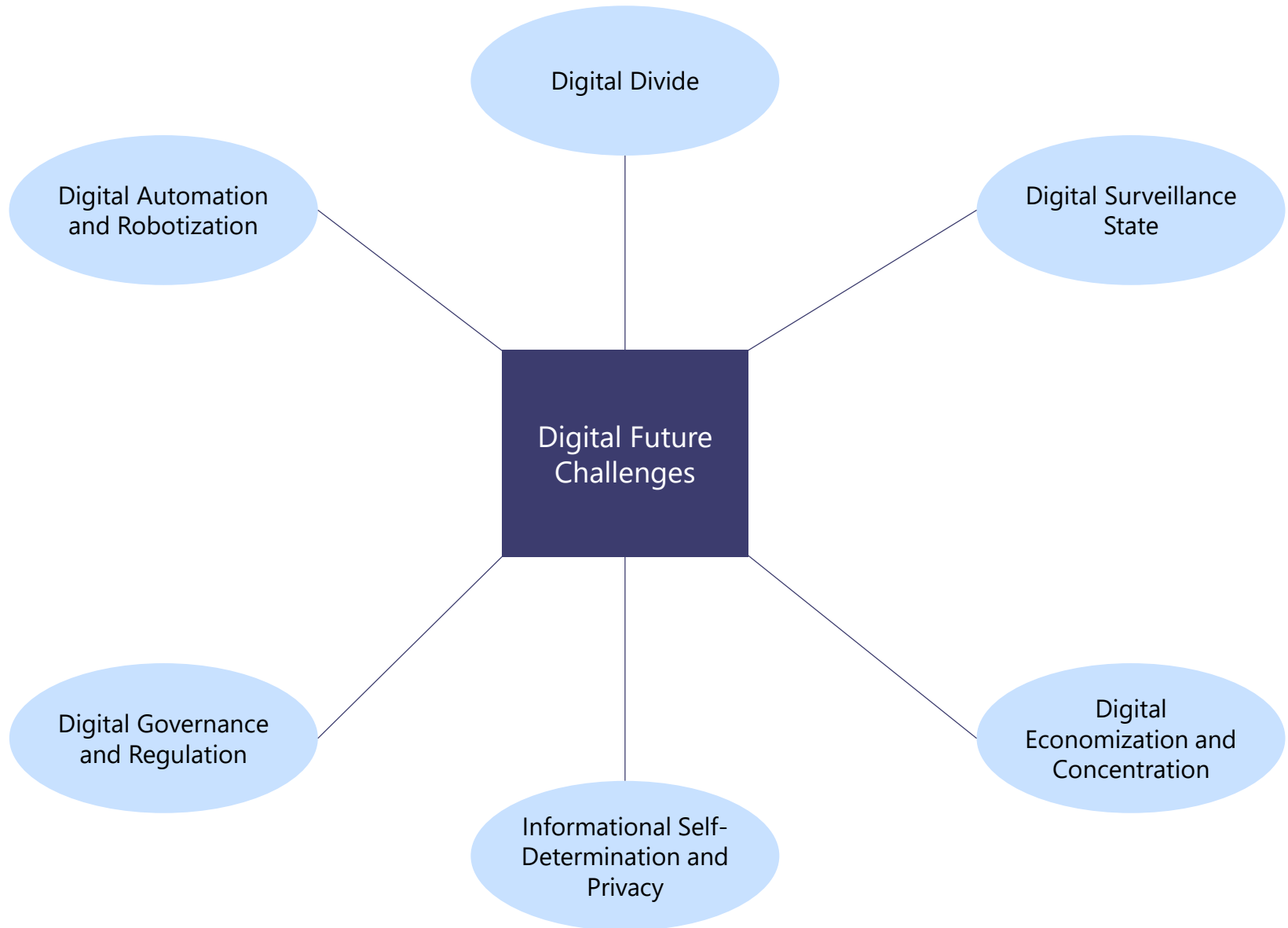


#### Online Exercises

1. Visit <https://www.cityoflondon.gov.uk/> and explore the London city portal.
2. Visit <https://portal.311.nyc.gov/> and explore the New York city portal.
3. Visit <https://www.gov.hk/> and explore the Hong Kong city portal.

# **Chapter 16: Digital Government Outlook**

**Fig. 16.1 Digital future challenges**



Source: Wirtz (2021b, 2022)