Swen Schneider
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Digital Business Management

Transforming to a Data-Driven Organization Using AI

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Preface

In today's rapidly evolving technological landscape, the ability to harness the power of artificial intelligence (AI) has become a cornerstone of success in both academia and the business world. *Digital Business Management* is more than just a textbook; it's a comprehensive guide designed to equip readers with the knowledge and skills necessary to thrive success in this dynamic environment.

By exploring the interplay between AI and digital business, this book offers a practical guide to navigating the complexities of the digital age. It demonstrates how companies can enhance efficiency, drive innovation, and achieve sustainable growth through effective AI implementation.

It bridges the gap between scholarly knowledge and actionable insights. It focuses besides Digitalization on the role of Artificial Intelligence (AI), particularly ChatGPT, in transforming business processes. More than just a tool, ChatGPT is critically examined, with special attention given to applied Prompt Engineering—the skill of crafting precise inputs for AI systems. By exploring these interactions, the book demonstrates how companies can enhance efficiency and drive innovation, offering readers a practical guide to successfully navigating the digital landscape.

In an era where technology has reshaped every facet of our lives, the ability to harness the power of artificial intelligence (AI) has become a paramount skill for both academic and professional success. *Digital Business Management* is a compass guiding you through the intricate landscape of the digital age and focusing on business success. Drawing upon our collective expertise in academia and industry, we have meticulously crafted this resource to provide a comprehensive understanding of digital business management. By leveraging the innovative capabilities of generative AI, we have created a dynamic and engaging learning experience that seamlessly blends theoretical concepts with real-world applications.

Solid foundation by exploring the *fundamental principles and strategies* that underpin successful digital enterprises is key to success in any business. Through the power of AI, we have been able to streamline the learning process, making complex ideas accessible and digestible.

The *Industry and Business Cases* delves into practical examples of how AI can be applied to drive innovation and achieve tangible results. By using Prompt

Engineering techniques, we have generated a diverse range of case studies that illustrate the potential of AI in various business domains.

Throughout this textbook, we have strived to make the content accessible and engaging, regardless of your background or experience level. Whether you are a seasoned professional or a budding entrepreneur, you will find valuable insights and practical guidance within these pages.

By understanding how to effectively leverage AI, you can position yourself at the forefront of the digital revolution. This book is more than just a tool; it's a catalyst for personal and professional growth. It's an invitation to embark on a journey of discovery, innovation, and unparalleled success.

We invite you to delve into the pages of *Digital Business Management* and unlock the boundless potential of AI in shaping your future.

Frankfurt, Germany

Swen Schneider
Lutz Anderie

About the Book

The textbook *Digital Business Management* is based on lectures by Swen Schneider and Lutz Anderie at Frankfurt University of Applied Sciences/Germany. Edited by Schneider and Anderie, the book stands out for its innovative use of generative AI. Content was developed from a lecture series in the Digital Business program, where lectures were recorded, transcribed, and enhanced through AI tools. The textbook provides concise explanations of key concepts in digital business, supported by graphics and case studies from companies like Uber, Airbnb, Microsoft Azure, Amazon, and Netflix.

By harnessing AI to summarize, analyze, and prepare complex business cases, Digital Business Management offers a forward-thinking and comprehensive approach to understanding digital transformation. This AI-driven approach not only transforms academic material but also showcases the real-world application of digital strategies in the evolving business landscape.

Further Reading notes: To ensure readers have access to the most current information, literature sources older than 5 years will be supplemented with the author's LinkedIn profile as a reference instead of the original source. Alternatively, the webpage of the university he is affiliated with or the company he works for.

Key Features

- *Three-part structure*: Divided into "How to Work with AI and Generate Success in Business," "From Digital to Data-Driven Organization," and "Industry and Business Case Prompt Engineering."
- *Generative AI-powered content*: Utilizes ChatGPT, Microsoft Bing, Copilot, and Google Gemini to create engaging and informative content.
- *Practical applications*: Real-world case studies and examples showcase successful AI implementations by leading companies.
- *Interactive elements*: Includes YouTube tutorials and a digital learning app (Digital Business Management Schneider Anderie) for enhanced learning.

Target Audience

- Students
- Entrepreneurs
- Executives
- Anyone interested in digital business strategies

Discover the Future of Digital Business

Digital Business Management is a guide to the future of business. By harnessing the power of AI, this book equips readers with the knowledge and tools necessary to thrive in the digital age.

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Part III Industry and Business Cases Prompt Engineering

About the Authors

Prof. Dr. Swen Schneider is the Director of the Institute for Data-Driven Business and has been a professor of Information Systems at Frankfurt University of Applied Sciences since 2003. From 2013 to 2019, he was the Dean of the Faculty and part of the extended university management. His research focuses on Digital Business, E-Commerce, Business Process Management, Applied AI, Trust and Bots, as well as eFinance solutions. As the program director of the Master's in Digital Business Management (M.Sc.) and founder of the Institute for Data-Driven Business, he advises companies on digital transformation, Enterprise Architecture, and Robotic Process Automation (RPA). His research also explores the use of bots and trust-building in online environments. He regularly publishes in recognized academic journals and writes articles on applied AI in practice. He also runs a podcast titled Psycho Digitale, which explores philosophical reflections on AI and psychology. He has conducted research and taught in the UK, India, and the USA, where, during a research stay at the University of Wisconsin-La Crosse, he led a project on generative AI in higher education. Swen Schneider studied Business Administration with a major in Information Management and a minor in Psychology and Computational Linguistics at the University of Trier, and earned his Ph.D. in Information Systems at Goethe University Frankfurt/Germany. He has held leadership roles at Mastercard, IBM, and Commerzbank, working on projects related to payment systems, mobile internet, and ePayments.

Prof. Dr. Lutz Anderie is a #1 bestselling author of business books on games, digitalization, and artificial intelligence. He is a Professor of Information Systems at the Frankfurt University of Applied Sciences. He led and conducted the Frankfurt Game Studies© I-III, an academic research series focused on the monetization and value chain of the games industry. The games industry is a digital frontrunner, bridging technology and entertainment with rapid advancements in AI, VR, and AR. Anderie has extensive global operational and strategic management experience in digital business, sales, marketing, and e-commerce with leading companies such as Sony, Hasbro, Paramount, Atari, and Fujifilm. He has held senior leadership roles as CEO, Vice President, Managing Director, Sales Director, Marketing Director, and E-Commerce Director with major stock market-listed corporations and SMBs (Small and Medium-Sized Businesses). He has built a strong, practical network in the consumer goods industry (manufacturers and retailers). He works with the 100 largest FMCG companies, such as Coca-Cola, Danone, Ferrero, and Procter & Gamble, in strategy and management development. Prof. Dr. Anderie runs a YouTube channel (keyword: Anderie) and two websites (Anderie-Management.com and Anderie-Digital.com). He is a founding member of the German Games Industry Association (game) and a member of the Quality Association for Serious Games (RAL), a registered association. He is also a member of the Institute for Data-Driven Business.

Part I
How to Work with AI and Generate Success in Business

Chapter 1
Effective AI Prompting

1.1 What Is AI and How Can It Be Applied in Business?

Artificial intelligence (AI) encompasses various fields, including machine learning, natural language processing, computer vision, robotics, expert systems, and more. Each field focuses on specific tasks, such as learning from data, understanding language, interpreting images, building robots, and reasoning like experts. AI can be broadly categorized into two main types: narrow AI and general AI (artificial general intelligence). This book focuses on the application of large language models (LLMs), which are considered narrow AI.

Artificial intelligence (AI) is the ability of machines to automate human-like tasks such as learning, problem-solving, and decision-making. You could achieve business success by leveraging AI to optimize business processes, reduce costs, and implement innovative solutions like robotic process automation or data-driven customer management. Personally, it can help you make more efficient decisions, gain a knowledge advantage, or quickly adapt to new topics.

1.2 AI Prompting and Prompt Engineering

A **prompt** is an input or instruction given to an AI model to generate a specific response. In the context of large language models (LLMs), prompts are used to instruct the LLM on what kind of text to generate. We encourage you to evolve the prompts in this book to meet your specific contemporary needs.

> *Example for a basic prompt: "Describe On Demand Service Companies in 80 words"*
> *Example for an advanced prompt: "Explain the actions taken to address the challenges or capitalize on the opportunities for On Demand Service Companies. This could involve strategies implemented, decisions made, or interventions undertaken. What happened recently? Limit your response to 200 words"*

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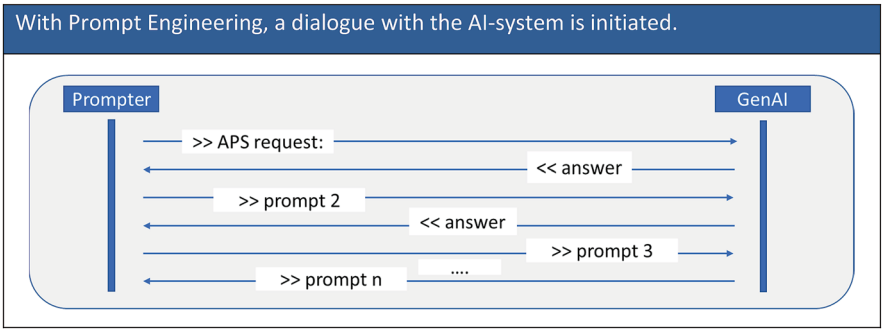

Fig. 1.1 Prompt Engineering

In most cases, you won't stop at just one question. Example application: as a leader in the technology sector, I want to find out whether/how/why the current AI trends are relevant for our company, because the background of the question is our future strategic direction, so that by the next meeting, the information can be concisely and clearly explained in 500 words and illustrated with real-life use cases. The output should be delivered in the form of a report.

This leads to an introduction to Prompt Engineering (iterative improvement of the prompts with interactive feedback), where questions are built interactively with the system and new questions are posed based on the answers received (Fig. 1.1).

Prompt Engineering is the process of crafting instructions, receiving responses, and iteratively refining your queries to guide a generative AI toward producing the desired text output. We recommend leveraging Prompt Engineering to address the "Essentials of Digital Business Management" outlined in the next part of the book and generate practical, real-life solutions.

Your benefits of Prompt Engineering: By leveraging AI and Prompt Engineering, you can unlock practical solutions, streamline Digital Business management, and enhance decision-making processes, ultimately driving innovation and efficiency:

- Increased Efficiency: AI can automate tasks like data analysis and initial content drafts, freeing up your time for critical thinking and in-depth analysis.
- Enhanced Creativity: AI can explore diverse perspectives and identify trends you might have missed, sparking new lines of inquiry.
- Improved Clarity: AI can help in structuring complex topics and presenting them in a concise and easy-to-understand manner.

Besides addressing the questions, you can also predefine your persona in the tool with specific needs or expectations in the settings. This ensures that all subsequent prompts are answered within that context, eliminating the need to repeatedly specify that information.

1.3 The AI Prompt Schema [AIPS]

But a prompt is more than just a simple question. The following AI Prompt Schema (Fig. 1.2) implies an organized template or set of guidelines for constructing prompts, typically including specific fields like target audience, desired output, tone, length, and context. It ensures consistency in prompt structure, allowing for customization based on task needs while optimizing for AI understanding and making the Prompt Engineering process user-friendly, even for nonexperts. This question structure provides the LLM with more background information as a prompt, leading to a better result.

WHO wants to understand [GOAL] with the purpose of the request because [CONTEXT], so that [PRIORITY/TIMEFRAME] can be explained in [TONE/LENGTH] using [EXAMPLES] in [TABLE/TEXT/IMAGE].

The AIPS (AI Prompt Schema) by Schneider/Anderie is based on seven questions **(who, what, why, when, how, wherein, where)** incorporating essential inputs for an excellent prompt. I [WHO, target audience] want to find out whether/how/why [WHAT, goal] applies, because the background of the question is [WHY, context], so that [WHEN, priority/timeframe] [HOW, tone/length] can be clearly explained and illustrated with [WHEREIN, examples]. The output should be delivered in the form of [WHERE, text/table/image].

Here's a roadmap to effectively work with OpenAI/ChatGPT, Google/Gemini, AI, and Prompt Engineering:

1. **Define Your Learning Objectives:** The foundation for any successful academic and business project lies in clear learning objectives. Ask yourself: What key takeaways do you want to gain from the case study? Understanding these goals will guide your approach to prompting the AI.
2. **Choose the Right AI and Large Language model:** Ensure that you work with the latest software version of a large language model, which is part of the so-called generative AI. Additionally, there are other large language models, such as Google Gemini. You can choose the one you prefer and access it via your computer or mobile phone.

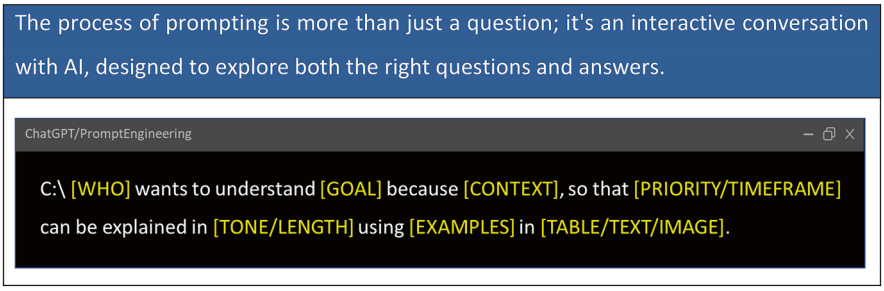

Fig. 1.2 The AI prompt schema

3. **Craft Compelling Prompts:** Here's where the magic happens! Your prompts will act as instructions for the AI, shaping the direction and content it generates. Effective prompts are:
   - Specific: Focus on a particular aspect of the case study, like analyzing a company's marketing strategy or its financial performance.
   - Clear: Use concise language and avoid ambiguity.
   - Informative: Provide context and relevant keywords to guide the AI toward the desired outcome.
4. **Refine and Iterate:** The initial AI output will likely require revision. Read through the generated content carefully, assessing its accuracy, relevance, and alignment with your learning objectives. Refine your prompts based on this evaluation and have the AI iterate until you achieve the desired level of detail and clarity.

As of the time of writing, the most popular LLMs are ChatGPT, developed by OpenAI and accessible through Microsoft Bing search engine, and Gemini, developed by Google Alphabet. It's advisable to verify the latest versions online, as product names, capabilities, and pricing models may change due to technical advancements and marketing strategies.

1.4 How to Work With the Industry and Business Cases

In today's academic landscape and business world, AI and Prompt Engineering offer exciting possibilities for generating content for industry analysis and business case studies. By harnessing AI's capabilities alongside your own expertise, you can streamline research, enhance clarity, and explore new avenues of analysis.

Start your research by using the basic prompts as a foundation. Then initiate a discussion with the AI system and engage in Prompt Engineering. Use the advanced questions as a starting point and apply the AI framework to guide the discussion.

Your key questions on the industry and business cases should be:
What industries thrive in the digital landscape, and who are the key players? How do they compete and generate revenue, and what challenges do they encounter, both generally and for specific players?

An optimal prompt balances detailed instructions with enough freedom for the AI to exercise a certain level of creativity or flexibility. Iterative refinement of the prompt can also help to continuously improve the results. It contains all relevant details to precisely guide the output but is not overloaded, leaving enough room for the AI to creatively interpret. Clarity and precision are crucial to obtaining consistent and useful results.

Through stepwise refinement, the AIPS can be divided into additional prompts that become increasingly detailed and better aligned with the desired outcome. This approach, known as chain-of-thought prompting, allows the AI not only to address

specific needs but also to interactively generate new ideas with the user. It also enables a "learning by teaching" scenario, where the user explains what they have understood and the AI provides feedback.

Beyond the specified needs within the persona, the AI can be assigned specific roles (explain me on expert or a child level). Additionally, during this process, the AI can be asked for advice, enabling a more targeted and effective generation of results that better meet the requirements.

- Prompt 1: Create a model schema outlining data entity structures and relationships. Ensure clarity and consistency for effective integration and understanding.
- Prompt 2: Generate a visual model schema to illustrate data entity hierarchies and connections, improving stakeholder communication with a clear, engaging diagram.
- Prompt 3: Analyze the current model schema for optimization opportunities, enhancing efficiency, scalability, and data integrity through actionable improvements.
- Prompt 4: Compare different model schema designs to identify the best approach, evaluating pros and cons for informed, best-practice decisions.

Part II
From Digital Business to a Data-Driven Organization

Chapter 2
From E-Business to Digital Business

Abstract

In a nutshell
The digital revolution has birthed the digital enterprise, where E-Commerce and E-Business distinctions are key. Network effects, disruption, and the shift from physical to digital products shape successful strategies. The ultimate goal is the full automation of primary processes, offering a seamless self-service experience for customers.

Keywords Digital business · E-Commerce · E-Business · Digitalization · Digital products · Commercial activities · Business operations · Network effects · Digital channels · Transactions · Digital era · Business models

Basic Prompts

- What is the fundamental difference between E-Commerce and E-Business?
- How do network effects contribute to the success of a Digital Business?
- What are the key characteristics of a Digital Business?
- How does the categorization of products (physical, semi-physical, semi-digital, digital) impact Digital Business strategies?

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In the era of **digitalization**, nearly every task can be accomplished through online platforms. This phenomenon has spurred the emergence of digital enterprises, which are predominantly or entirely operated in the physical-virtual realm. But what precisely constitutes a Digital Business? It denotes the manner in which commercial activities are conducted in the contemporary digital era, encapsulating every facet of business operations, ranging from marketing and sales to product innovation and day-to-day functioning. The aim of the following discourse is to offer an introductory overview of Digital Business, shedding light on its fundamental principles and key components.

2.1 E-Business and E-Commerce

E-Commerce and E-Business are two aspects of Digital Business operations, each serving a distinct function within the modern business landscape. **E-Commerce**, or electronic commerce, is primarily focused on the facilitation of commercial transactions through digital channels.

Figure 2.1 provides an overview on the difference of E-Commerce and E-Business. In essence, while E-Business emphasizes **cost management**. E-Commerce prioritizes **revenue generation** through digital channels, thereby fostering efficient and profitable commercial engagements in the digital landscape. It is the activity of buying and selling goods and services over the Internet. It encompasses a wide range of commercial transactions conducted through various digital

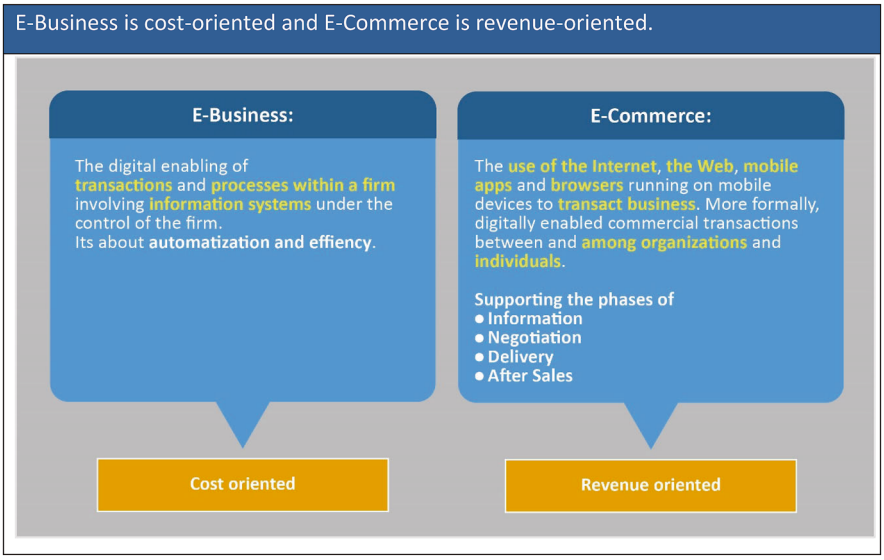

Fig. 2.1 The difference of E-Business and E-Commerce

platforms, from large online retailers like Amazon to smaller specialized shops. E-Commerce enables consumers to shop for products, compare prices, and make purchases from the comfort of their homes using computers or mobile devices. This digital marketplace operates 24/7 and offers a vast selection of products across global borders. It streamlines sales, marketing, and customer service processes, providing convenience for consumers and expanding market reach for businesses. E-Commerce embodies a focus on **maximizing revenue generation**. It leverages the Internet, web platforms, and mobile applications, enabling commercial transactions among entities and individuals. E-Commerce is covering various phases of a commercial transaction, including initial **information phase** comprising gathering and research, the **negotiation phase** (although this is often limited in platforms like Amazon where prices are fixed), **delivery phase** (which can be either digital, like downloading an MP3 file, or physical), and **after-sales support**. This model is designed to maximize revenue generation by streamlining the process of commercial transactions to enhance profitability and improve the customer experience. Conversely, **E-Business** enables companies to automate processes, manage E-Business operations more effectively, and facilitate communication between employees, suppliers, and customers. It supports operational processes within a company, utilizing information systems managed internally to enhance optimization and efficiency. **E-Business** leans toward **cost-efficiency** and **automatization** especially of business processes. It also tries to improve **interoperability and data flow by connecting systems** with each other.

E-Commerce encompasses various classifications based on the nature of transactions. The primary categories include **business-to-consumer (B2C), business-to-business (B2B),** and **consumer-to-consumer (C2C).** Figure 2.2 illustrates, in a self-explanatory manner, how E-Commerce can be categorized by placing "Demanding Business Activities" and the related "Offerings of Business Activities" in perspective.

In **B2B** transactions, companies engage in the exchange of services and goods among themselves. **B2C** involves businesses selling products or services directly to consumers, representing a conventional E-Commerce model. Of growing significance is the C2C model, wherein individuals interact on digital platforms to exchange services, information, or products. An example for consumer to administration (C2A) could be the electronic tax declaration. This dynamic platform-mediated exchange highlights the evolving nature of E-Commerce, emphasizing peer-to-peer interactions and leveraging IT and web platforms for seamless transactions.

Digital products or **intangible products** significantly shape the landscape of Digital Business by offering unique advantages and characteristics compared to traditional physical goods. Figure 2.3 depicts how products can be categorized into four types: physical products, semi-physical products, semi-digital products, and (purely) digital products. Each type varies in its degree of digital integration.

Physical products are tangible goods that exist in the real world and have no reliance on digital components for their core functionality or value. These products

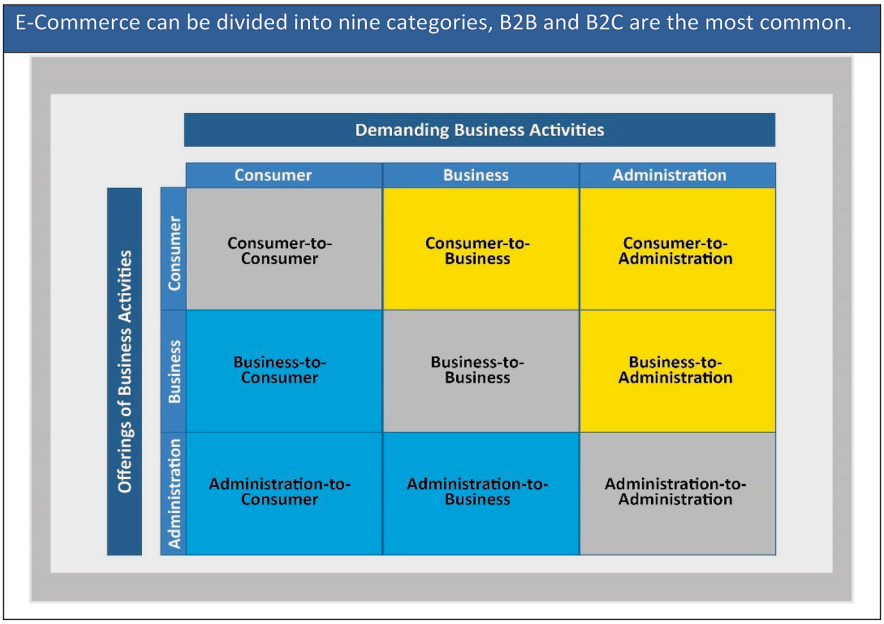

Fig. 2.2 Categorization of E-Commerce

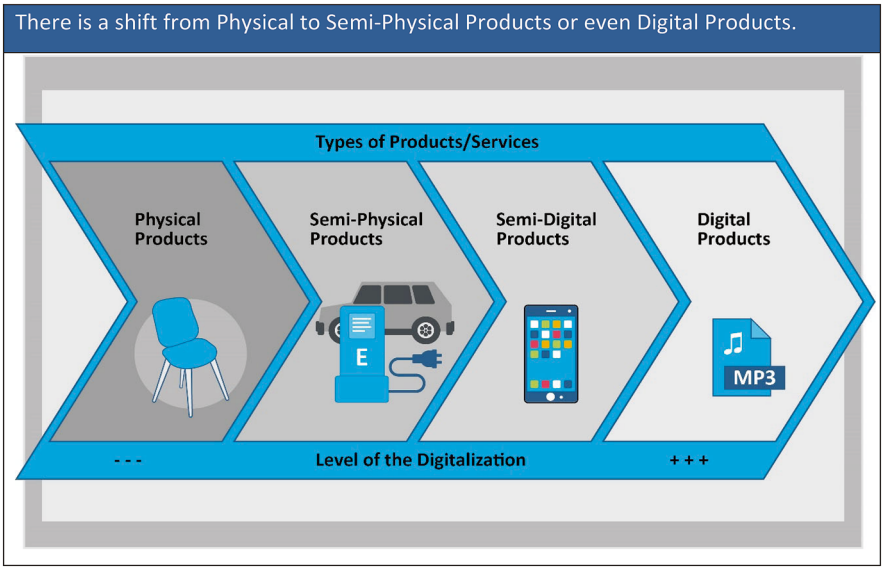

Fig. 2.3 Intangible products (from physical to digital products)