



Yuri Popov

Digitalisation in the German Mittelstand

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Mit einem Vorwort von Prof. Dr. Heinz Siebenbrock

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List of Abbreviations

| | |
|------------------|--|
| BMWi..... | Federal Ministry for Economic Affairs and Energy |
| CSOFT | Customer relationship, Service, Organization, Finance, Technology |
| DBT | Digital Business Transformation |
| DIHK | Deutscher Industrie- und Handelskammertag e.V. |
| DT | Digital Transformation |
| EKAM | European Competence Centre for Applied Mittelstand Research |
| EU | European Union |
| EY | Ernst & Young GmbH Wirtschaftsprüfungsgesellschaft |
| GDPR | General Data Protection Regulation |
| ICT | Information and Communications Technology |
| IfM | Mittelstand Research Institute |
| IoT | Internet of Things |
| IT | Information Technology |
| IW..... | Institute of the German Economy |
| KfW..... | Credit Institute for Reconstruction |
| M | Mean |
| PESTLE | Political, Ecological, Sociocultural, Technological, Economic, Legal |
| R&D | Research and Development |
| SD | Standard Deviation |
| SE | Standard Error |
| SMACIT | Social, Mobile, Analytics, Cloud, and the Internet of Things |
| SMART | Specific, Measurable, Achievable, Realistic, Time-bound |
| SME | Small and medium-sized enterprise |
| STOF .. | Service Domain, Technology Domain, Organization Domain, Finance Domain |
| SWOT..... | Strengths, Weaknesses, Opportunities, and Threats |
| VISOR | Value, Interface, Service Platforms, Organizing Model, Revenue/Cost |
| VUCA | Volatility, Uncertainty, Complexity, and Ambiguity |
| VUCA prime | Vision, Understanding, Clarity, and Agility |
| ZEW | Centre for European Economic Research |

Foreword

It is no longer a question of whether the German Mittelstand should become more digital. Rather, it is about how the Mittelstand can become more digital. The digitalisation of existing processes has already led to the considerable simplification of work and cost savings. Commercial correspondence, from invoices to tax returns, has not been conducted with a typewriter for some time. Everything has become faster and easier, but have we also become more satisfied as employees and customers? Do the products and services of classic Mittelstand companies satisfy people's needs better than ever before?

One gets the impression that digitalisation often degrades, even suppresses, the individual. And yet, people sometimes submit to digitalised processes even more consistently than they once did to the assembly line. This suppression is no longer limited to the internal organisation; the customer is immediately included: endless waiting loops, ticket-controlled processes and conversations that follow a script. Service, in particular, is being downgraded rather than upgraded in large – and increasingly also in medium and small – companies. Mittelstand companies should be expressly cautioned against this form of digitalisation!

Instead, let's use digitalisation to improve communication, especially in the Mittelstand! Home offices, video conferencing, and special platforms for sharing information have suddenly boomed in times of the pandemic. Concepts for increasing adaptability, such as agility, have been on everyone's lips. What was interesting was not that these techniques and concepts were introduced, but how they were implemented. Some companies discovered new capabilities for monitoring in video conferencing and platforms: video conferencing and access statistics from these platforms compensated for the loss of control that home offices had caused. Other companies, however, have successfully conceptualised the home office as a source of self-organisation, creativity and genuine proximity to employees and customers.

The mindset with which digitalisation is introduced and implemented is thus also important in the Mittelstand. I am pleased that Yuri Popov has also championed this idea in his work on the digitalisation in the German Mittelstand.

Prof. Dr. Heinz Siebenbrock

May 2021

Preface

The German Mittelstand is the engine of the German economy and refers to the entirety of owner-managed and family-run businesses. While the business environment is constantly changing, enterprises must adapt to new market conditions to ensure competitiveness and future viability. Although the Mittelstand has a fundamental social, political, and economic importance, numerous Mittelstand companies are facing great challenges in the digital age. Rapid technological development and changing customer requirements are forcing companies to adjust or even change their products, processes, value chains, business models, structure, and culture. Thus, this book focuses on the development of digitalisation in the German Mittelstand and the management of digital transformation.

I would like to express my sincere gratitude to Prof. Dr. Heinz Siebenbrock for his constant support and invaluable advice. His immense knowledge and plentiful experience encouraged me throughout the writing process.

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Special thanks to my senior lecturer Edward Sodmann for his persistent encouragement during my studies.

I would like to express my profound and sincere gratitude to my family. I am deeply indebted to my parents for their continuous and unparalleled love, support and encouragement. Without them, this undertaking would not have been possible.

Last but not least, I would like to sincerely thank and recognise my partner, Marina Lipski, for her encouragement and support. Marina has constantly supported, motivated, encouraged and inspired me throughout the writing process. As such, this book is dedicated to Marina.

Yuri Popov

May 2021

Abstract

Digitalisation is leading to far-reaching changes and challenges in the German Mittelstand. German Mittelstand companies are owner-managed or family-run businesses that significantly contribute to the well-being of the German economy. Although Mittelstand companies are currently highly challenged by digitalisation, they must adapt to these new conditions to remain competitive. However, academic literature is still limited in the domain of digitalisation in the Mittelstand, and there is insufficient information on how Mittelstand enterprises can successfully manage digital business transformation.

This work attempts to answer the question of how the German Mittelstand has adapted to the changes and managed the challenges caused by digitalisation in recent years. Moreover, this book explains in detail the nature of the German Mittelstand, as well as the specifics and differences from other company types, while identifying systematic design options for digital transformation. For this reason, the focus also falls on business model innovation and leadership in the digital age, as these are crucial for digital business transformation.

The work analyses large-scale survey data by using the descriptive statistical methods. Based on the quantitative analysis, the study explores the academic theories and practical models that can help manage digital transformation in Mittelstand enterprises. The German Mittelstand increasingly recognises the importance of digital technology for business models and assesses digitalisation as an opportunity.

However, the research finds that there are fundamental differences between small, medium, and large firms, and the degree of digitalisation differs widely across German sectors. Particularly, research and development intensive and knowledge-based sectors understand the importance of digitalisation. The analysis finds that Mittelstand companies predominantly focus on digitalising the customer relationship, while digital products and services are still given too little consideration. Additionally, the Mittelstand is not hindered in investing in digitalisation, but it nonetheless faces considerable challenges during digital business transformation, such as a lack of information technology skills and specialists, the fulfilment of data security and data protection requirements, and the adoption of the company and work organisation.

This work determines that the role of the Mittelstand manager is fundamental for digital business transformation due to the manager's crucial impact on the company through the unity of ownership and

management. Simultaneously, employees must accept the changes caused by digitalisation and understand their new roles and responsibilities. In this context, digital leadership is a useful approach for managing digital transformation, as it is a cross-sectional competence that combines different necessary theories, methods, and instruments.

The managers and employees of Mittelstand companies wherein digitalisation is subordinate require further training to understand its risks and opportunities, as well as to gain digital skills for managing digital transformation. Mittelstand managers must assess the availability of resources to define relevant trends and conduct digitalisation projects. Furthermore, the digital transformation must be customer- and employee-orientated to meet customer needs and ensure employee satisfaction. Finally, the creation of a digital vision, strategy, and culture is essential to successfully adapting to the changes of digitalisation and managing the challenges of digital transformation.

1. Introduction

Today, all enterprises are highly influenced by digitalisation and interconnection, regardless of their size or sector (BMW, 2019). Rapid technological development is a fundamental aspect of the existing complex environment, as it demands that managers in business, politics, and society oversee digital transformation (Hensellek, 2020; Petry, 2018). Because digitalisation significantly changes how companies capture and create value, effective leadership is a crucial precondition for supporting a company through the digital business transition (Larjovuori et al., 2018). The volatile, uncertain, complex, and ambiguous nature of digitalisation represents a strategic issue for most German managers (Hensellek, 2020), as they struggle to assess the impact of digitalisation on the company, and academic and practical literature is limited (Cravotta and Grottke, 2019). Digitalisation is an all-encompassing phenomenon that offers both great opportunities and challenges for the German Mittelstand (Demary et al., 2016). In this context, the Mittelstand refers to the entirety of owner-managed and family-run businesses, characterised by a unity of ownership and management (Welter et al., 2015). The Mittelstand is also considered to be the backbone of the German economy, so digitalisation plays a major role for Mittelstand enterprises in terms of competitiveness and future viability (BMW, 2019). Due to the rapid development of digitalisation, it is essential that Mittelstand managers recognise relevant trends promptly and use the opportunities of digitalisation in their own companies (Schröder et al., 2015). However, digitalisation is still a major challenge for a large part of the German Mittelstand today, as the establishment of modern digital technologies is mainly seen as a purely technical task (Bijedić et al., 2018).

German Mittelstand companies are internationally recognised for being highly innovative while simultaneously acting in secrecy (Leyh et al., 2018). Consequently, academic literature is sparse, whereas general literature on small and medium-sized enterprises (SMEs) and digitalisation is common (Cravotta and Grottke, 2019). Mittelstand companies are essential for the German economy, especially in a time of serious structural change, so it is important to understand the factors that impact their performance during the digital transformation process (Lindner, 2019; Carsrud and Cucculelli, 2014). However, there is still little evidence regarding the challenges, consequences, and antecedents of digitalisation in German SMEs (Eller et al., 2020) and German Mittelstand companies, particularly. Therefore, the relevance of digitalisation in the

German Mittelstand has gained significant attention in recent years, although insufficient academic and practical research has been conducted into the Mittelstand in the digital age. Reputable organisations such as the Mittelstand Research Institute (IfM), the Credit Institute for Reconstruction (KfW), the Federal Ministry for Economic Affairs and Energy (BMWi), the Centre for European Economic Research (ZEW), and the Institute of the German Economy (IW) have realised the importance of digitalisation for the Mittelstand and started to contribute to this research area, helping Mittelstand companies manage digital business transformation. Although digitalisation has started to garner more attention within the Mittelstand, most Mittelstand companies do not yet fully utilise the available potential of digitalisation and still lag behind the technological evolution (KfW, 2019). It is therefore the responsibility of management to drive digitalisation forward and address its diverse effects on the company and employees (Bijedić et al., 2018). Nonetheless, more academic and practical research is required to understand how digitalisation affects the German Mittelstand (Schröder et al., 2015) and which measures can help management address digital business transformation (Hensellek, 2020).

Regarding the relevance of digitalisation in the Mittelstand and the need for Mittelstand managers to administer digital transformation, it is necessary to analyse how the German Mittelstand adapts to changes and manages the challenges caused by digitalisation in recent years. This work analyses the recent development of digitalisation in the German Mittelstand and determines the major factors that influence Mittelstand companies during digital transformation. To gain new insights about digitalisation in the German Mittelstand, the objective is to analyse its development and challenges and identify the trends of digitalisation in the German Mittelstand. Additionally, the objective is to examine the influence of digital technology on the business model of Mittelstand companies related to turnover, sector affiliation, and the type of business activity. This work also identifies the factors hindering digitalisation and the current challenges of digital transformation. The objective is to assess the role of business model innovations and leadership styles for addressing digital challenges and managing transformation.

This book intends to contribute to the existing academic and practical literature, as no longitudinal studies have examined the long-term development of digitalisation in the German Mittelstand. Although academic literature is available in the domain of digitalisation, digital business transformation, business model innovation, and leadership, there

is little research that specifically focuses on Mittelstand companies in the digital age. Therefore, this book especially supports Mittelstand management in addressing digitalisation challenges and digital business transformation. Additionally, this work helps Mittelstand companies, relevant organisations, and supporting institutions achieve more clarity regarding the development of digitalisation in the German Mittelstand. This thesis also increases awareness of the need for robust leadership in the digital age, as digitalisation can heavily affect the existence of Mittelstand companies. This book can help Mittelstand managers address digital challenges and manage digital transformation successfully.

In terms of structure, this book provides a critical review of the academic and practical literature. In this context, the specificities of the German Mittelstand are explained in detail based on quantitative and qualitative characteristics; additionally, significant differences from other company types are highlighted. Afterwards, there is an overview of digitisation, digitalisation, and digital transformation and their significance for companies, followed by a review on the importance of business models, business model innovation, and strategy. This book then reviews leadership theories and assesses the suitability of digital leadership for managing the digital transformation. Next, it examines the importance of digital technology for the business model; the differences between small, medium, and large Mittelstand companies; the degree of digitalisation in German sectors; and the challenges and opportunities of digital transformation for the Mittelstand. Furthermore, a conceptual framework synthesises all the theories, models, and concepts. The research plan is then presented, and the methodology and methods used by secondary sources are discussed. In the data analysis, the results of the quantitative analysis, focusing on the importance of digital technology for the business model, impeding factors, challenges, and the assessment of digitalisation, are presented, followed by an interpretation of the research material while relating the results to the academic studies from the literature review. Additionally, the work provides relevant managerial implications by describing the academic and practical theories and concepts of digital transformation. Finally, the main findings, practical recommendations, and research limitations are summarised.

2. Literature Review

2.1 Characteristics of the German Mittelstand

2.1.1 Quantitative approach

Various indicators are used for the quantitative description of SMEs – for example, the number of employees, annual turnover, and balance sheet total. With the help of quantitative indicators, an accurate statistical coverage of enterprises with different size classes is possible. The Bonn Mittelstand Research Institute’s definition of ‘SME’ has prevailed in Germany and is commonly used in academic debate in German-speaking countries (Reinemann, 2019; Becker and Ulrich, 2015). As shown in Table 1, the IfM Bonn (2021a) defines SMEs as follows:

| Enterprise size | Number of employees | Turnover |
|------------------------|----------------------------|-----------------------------------|
| Micro | ≤ 9 | $\leq \text{€}2 \text{ million}$ |
| Small | ≤ 49 | $\leq \text{€}10 \text{ million}$ |
| Medium-sized | ≤ 499 | $\leq \text{€}50 \text{ million}$ |
| <i>Large</i> | ≥ 500 | $> \text{€}50 \text{ million}$ |

Table 1: SME definition of the IfM Bonn

Source: Adapted from IfM Bonn (2021a)

The IfM Bonn’s SME definition mostly aligns with the European Commission’s definition. The only difference is that medium-sized enterprises can occupy up to 499 employees, not 249 employees. According to the IfM Bonn (2021a), this difference is explained by the enterprise structure in Germany, as the size of German companies is, on average, larger than in the EU. For the IfM Bonn’s SME definition, companies with 500 and more employees and an annual turnover of more than €50 million do not fulfil the quantitative criteria of an SME. However, the IfM Bonn (2021b) strictly distinguishes between SMEs and the Mittelstand, arguing that official statistics do not contain sufficient information on the defining qualitative characteristics of Mittelstand companies (economic independence, ownership, and management). The economic and statistical significance of the Mittelstand is, therefore, typically approached by resorting to SME data (IfM Bonn, 2021c).

Internationally, however, only the SME definition of the European Commission – not that of the IfM Bonn – is authoritative. Table 2 consequently demonstrates the European Commission’s SME definition: