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BOOK REVIEW:

BIG DATA IN SMALL BUSINESS. DATA-DRIVEN GROWTH IN SMALL AND MEDIUM-SIZED ENTERPRISES, C. LUND PEDERSEN, A. LINDGREEN, T. RITTER, T. RINGBERG (EDITED BY), EDWARD ELGAR PUBLISHING, 2021

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Abstract

The book critically examines how small and medium-sized enterprises (SMEs) can exploit big data to enhance strategic decision-making, operational efficiency, and competitiveness. Through expert contributions and in-depth case studies, it addresses key themes such as human capital analytics, digital transformation, and data-driven learning. The book emphasizes practical, scalable solutions for SMEs to overcome resource limitations and integrate data analytics into their business models. By providing a comprehensive framework, it equips SMEs with tools to effectively promote sustainable growth and innovation in an increasingly data-centric global market.

Review

"Big Data in Small Business" is a well-structured and comprehensive book that guides readers through the key aspects of leveraging big data in SMEs. Divided into four main sections, the book offers an in-depth exploration of foundational principles, the development of digital capabilities, and the practical integration of data across a wide range of business functions. It also focuses on the strategic process of digital transformation, providing SMEs with detailed guidance on effectively leveraging big data to optimize operations, enhance decision-making, and drive innovation. Each section builds on the previous one, presenting a holistic framework that empowers businesses to overcome the complexities of the digital landscape and achieve sustainable growth through data-driven strategies.

In more detail, the first section, Foundations, establishes the essential principles of big data, addressing key challenges specific to smaller businesses, such as regulatory compliance and scalability. The second section, Capabilities, focuses on developing the necessary digital competencies, offering strategic insights into how SMEs can effectively integrate data-driven processes into their operations. In Functions, the third section, the book turns its attention to the practical application of big data across different business areas, including human capital management and customer engagement. Lastly, the Transformations section provides an in-depth look at the digital transformation journey, equipping SMEs with the knowledge needed to adopt big data technologies and achieve long-term competitive advantages.

The Foundations section is composed of three chapters. In Chapter 1, Karen G. Mills and Annie V. Dang explore the transformative potential of AI and big data for SMEs. Through the specific case study of Alex, a coffee shop owner, they provide a vivid illustration of how AI-powered dashboards can revolutionize daily operations. Alex's business is effortlessly managed through this AI dashboard, handling tasks like supply chain management, employee scheduling, and cash flow forecasting. This practical example highlights how AI and big data democratize capabilities once reserved for large enterprises, allowing smaller firms to optimize operations, reduce costs, and improve decision-making. The authors emphasize not only the operational efficiencies enabled by AI but also two critical benefits for small businesses: access to actionable insights and improved access to capital. Mills and Dang highlight how predictive analytics allow small businesses like Alex's to adjust inventory in real time, anticipate customer preferences, and even optimize pricing strategies. Most significantly, the chapter discusses how fintech innovations powered by AI are streamlining the lending process, enabling SMEs to receive faster and more accurate credit assessments, thus improving their financial flexibility. The concept of a "Small Business Utopia," as coined by the authors, envisions a future

where big data and AI facilitate the seamless operation of small businesses. However, the authors also address the risks associated with over-reliance on data and automation. They highlight concerns about data privacy, transparency, and the ethics of AI-driven decision-making, advocating for "smart regulation" to protect SMEs and their customers, ensuring that the benefits of big data do not come at the cost of security and privacy.

Chapter 2, authored by Jan Trzaskowski, explores the crucial aspect of General Data Protection Regulation (GDPR) compliance for SMEs. The author provides a clear and thorough interpretation of the six key principles of GDPR: Legitimacy, Proportionality, Empowerment, Transparency, Accountability, and Security. While GDPR compliance can often seem challenging for smaller firms with limited resources, the chapter simplifies these complex regulations into practical, actionable guidelines. In doing so, Trzaskowski effectively bridges the gap between legal theory and practical application, helping SMEs integrate data protection measures into their daily operations without hindering innovation. A valuable aspect of the chapter is its presentation of GDPR compliance not merely as a legal obligation but as a strategic advantage, enabling businesses to build customer trust and gain a competitive advantage.

Chapter 3, written by Vania Sena and Sena Ozdemir, provides a comprehensive theoretical and empirical analysis of the broader organizational impacts of big data adoption in SMEs. The authors argue that big data can significantly reduce coordination costs and enhance internal collaboration within SMEs. However, they also point out that many SMEs lack the necessary internal capabilities and infrastructure to fully leverage these technologies. A key theme in this chapter is the gap between the potential of big data and the reality faced by many SMEs, with resource constraints acting as a major barrier to adoption. The chapter's adoption of statistical analyses, including Sys-GMM estimates, strengthens its arguments by providing empirical evidence that organizational restructuring and investments in human capital are essential for SMEs to realize the full benefits of big data. This analysis of challenges offers a realistic perspective on the digital transformation journey for SMEs.

The second section, Capabilities, comprises four chapters that focus on how SMEs can develop the necessary digital skills and infrastructure needed to succeed in the Industry 4.0 era.

In Chapter 4, Bieke Struyf, Wouter Van Bockhaven, and Paul Matthyssens present a longitudinal case study of a Belgian manufacturing SME to illustrate the company's transition from traditional operations to a fully data-driven business model. This chapter is particularly valuable for its in-depth exploration of resource alignment and the strategic use of digital platforms to enable new forms of value creation. The case study demonstrates how the company overcame common challenges faced by SMEs,

such as limited resources and technological expertise, by focusing on incremental innovation and leveraging external partnerships. The authors argue that adopting servitization models and digital platforms can unlock new revenue streams for SMEs, an insight especially relevant as industries undergo rapid digital transformation.

Chapter 5, by Carsten Lund Pedersen and Thomas Ritter, offers a detailed framework for assessing and developing SMEs' digitization capabilities. The authors propose that digitization capabilities should be viewed as ongoing organizational routines, while data-driven projects are finite, time-bound initiatives that SMEs can implement to drive growth. They provide a step-by-step guide on how SMEs can measure their digital readiness through a "workshop series" approach, which includes evaluating data collection, analytics, and integration processes. This practical framework is invaluable for SMEs seeking a structured path toward digital transformation, particularly for those uncertain about where to begin.

Chapter 6, authored by Joel Mero, Heikki Karjaluoto, and Tanja Tammisalo, presents an insightful case study on Glaston, a glass-processing technology company, and its innovative use of big data through the development of the Glaston Siru app. This app employs image recognition and neural networks to perform tempered glass fragmentation tests, a crucial quality control step in the glass industry. Traditionally, these tests were either labor-intensive or required costly industrial equipment. The Glaston Siru app simplifies this process, enabling users to capture a picture of fragmented glass and automatically conduct the test, highlighting Glaston's capabilities in big data and AI. The chapter underscores how Glaston's open innovation approach and willingness to experiment with new technologies allowed it to create a cost-effective and highly functional tool, strengthening its position as a technological leader in the glass industry. By examining this case study, the authors expand on the broader implications of adopting big data and AI in traditional industries like glass processing. The key insight is that SMEs, even in traditional sectors, can benefit from digital transformation if they are open to partnerships and committed to exploring the potential of new technologies.

Chapter 7, authored by Shirley Y. Coleman, explores how SMEs can collaborate with universities to strengthen their data science capabilities. In the context of Industry 4.0, big data offers businesses significant opportunities to enhance processes, outputs, and competitiveness through advanced data strategies like predictive analytics and machine learning. However, many SMEs lack the internal resources and expertise needed to fully leverage these technologies. Coleman highlights several collaboration options, such as training staff, hiring data specialists, or forming partnerships with universities. A prominent model discussed is Knowledge Transfer Partner-

ships (KTPs), which allow SMEs to co-fund projects with universities, gaining access to advanced research and tools. These partnerships enable SMEs to overcome resource limitations while benefiting from university expertise. Drawing from her experience in a self-funded university unit, Coleman shares successful case studies of partnerships that improved business efficiency and innovation through data-driven approaches. The chapter includes a flowchart of the engagement process, outlining key steps for productive SME-university collaboration: initial contact, needs assessment, project planning, implementation, and evaluation. A central insight of this chapter is the emphasis on mutual understanding, clear objectives, and strong management as essential elements for effective collaboration. SMEs benefit from tailored solutions and access to trained professionals, while universities gain valuable real-world applications for their research. Coleman underscores that these partnerships should be viewed as long-term investments, helping SMEs address immediate challenges while building the capacity to innovate in the future.

The third section, Functions, focuses on how SMEs can apply big data across various business areas, from human capital management to customer engagement.

In Chapter 8, Frederikke Amalie la Cour Nygaard and Dana Minbaeva explore the transformative potential of Human Capital Analytics (HCA) for SMEs. While much research centers on large organizations, the authors argue that SMEs can also greatly benefit from HCA to improve strategic decision-making. By leveraging data to monitor and optimize employee performance, businesses can create value, manage talent, and improve competitiveness. However, SMEs face challenges such as limited resources and data availability. The chapter suggests that the smaller, more agile nature of SMEs could be advantageous for HCA adoption, as these firms can more easily integrate and act upon insights generated. The authors stress the importance of data quality, emphasizing that SMEs must ensure the data they collect is both accurate and relevant for analysis. They also discuss the need for a cultural shift within organizations to embrace data-driven decision-making. Ultimately, the chapter advocates for early adoption of HCA in SMEs, as this can enhance their long-term success and lead to more informed talent management decisions. The ability to use human capital data effectively provides SMEs with a competitive edge in today's data-driven marketplace, particularly when aligned with business objectives.

In Chapter 9, Camilla Nelleman and Torben Pedersen examine the impact of big data and experimental methods on optimizing e-learning for SMEs. The authors argue that by collecting data on user behavior in e-learning environments, companies can more effectively tailor training programs to meet employee needs. The chapter presents a case study of a soft-

ware company that experimented with different digital training formats, demonstrating the benefits of shifting from traditional classroom-based learning to an online format. By analyzing behavioral data, the company was able to adjust the content and structure of its courses to improve user engagement and retention. This experiment resulted in improved learning outcomes and cost efficiency for the company. The authors emphasize that SMEs can use similar experimental approaches in training and other business operations to determine what works best in real-time, rather than relying on assumptions. They conclude that data-driven decision-making, particularly in employee learning and development, is crucial for SMEs to stay competitive. The chapter encourages SMEs to continuously experiment with and adapt their e-learning practices to ensure maximum effectiveness and efficiency in workforce training.

In Chapter 10, Poul Houman Andersen examines the implications of big data on business market relationships, focusing on the debate over whether big data represents a disruptive force or an evolutionary enhancement for business practices. The chapter highlights how SMEs, despite their limited resources, can leverage big data to build, maintain, and enhance their market relationships with customers. Unlike larger corporations, SMEs often rely on a smaller, more focused customer base, making long-term relationships essential for their survival. The chapter introduces the concept of "market relationship presence", defined as a firm's ability to establish, develop, and protect valuable exchange relationships with both customers and suppliers. Big data allows SMEs to more accurately target customers' demands and tailor offerings, which can significantly improve their market presence. Andersen argues that, although big data can increase SME competitiveness, it also requires a shift towards more data-driven interactions with customers. The implications for SMEs are clear: big data provides a powerful tool to enhance business relationships by offering deeper insights into customer behaviors, preferences, and expectations. However, Andersen cautions that managing these new data sources can be time-consuming and costly. SMEs must balance the benefits of real-time insights with the challenges of implementing and maintaining big data systems. Ultimately, while big data offers substantial opportunities for SMEs, success depends on a strategic application that aligns with business objectives.

In Chapter 11, Henrik Andersen and Thomas Ritter introduce the concept of "revenue blueprinting" as a strategic approach for SMEs to leverage customer data and insights for business growth. The chapter outlines a three-step process that combines explicit customer data (e.g., revenue history) with tacit knowledge from sales teams to identify potential revenue growth opportunities. Step 1 focuses on calculating revenue blueprints using explicit data, such as revenue patterns and product-category sales from existing customers. Step 2 involves verification by customer-facing

employees, who combine their insights with data to better assess growth opportunities. Finally, Step 3 is the implementation of strategies, where businesses categorize customers based on their potential and allocate resources to unlock additional revenue. Overall, the chapter emphasizes that this data-driven blueprinting process is low-cost, making it particularly suitable for SMEs with limited resources. Andersen and Ritter argue that this method not only accelerates revenue growth but also strengthens customer relationships by using insights already embedded within the company. Furthermore, they suggest that applying revenue blueprinting can lead to immediate and sustainable revenue improvements, as sales strategies become more targeted and effective over time.

The final section, Transformations, shifts focus to the broader digital transformation process and the role of big data in helping SMEs remain competitive in the digital age.

In Chapter 12, Bard Tronvoll, Christian Kowalkowski, and David Sérhammar discuss the challenges that SMEs face when transitioning to a digital business environment. The authors emphasize the importance of digital servitization, where traditional product-based offerings are transformed into digital services to enhance value creation and customer engagement. The primary motivation for SMEs to embrace this transformation is the pursuit of competitive advantage, especially within a landscape reshaped by rapid technological advancements. A central concept in this chapter, "digital servitization", combines the trend of servitization (the shift from products to services) with digitalization. This shift is described as essential for SMEs, enabling them to stay relevant in increasingly competitive markets. The authors identify three transformational shifts required for digital servitization: dematerialization (separating information from physical goods), identity shifts (redefining what the business represents in a digital age), and collaboration (working with other ecosystem actors to create value). According to the authors, a significant challenge for SMEs is the lack of technical infrastructure and financial resources needed for this transition. Despite these challenges, SMEs are uniquely positioned to adapt due to their agile structures and close customer relationships. In this context, SMEs should develop a digital servitization strategy, integrating digital services to remain competitive and enhance customer engagement.

Finally, in Chapter 13, Pernille Rydén and Helle Rootzén explore the journey of Danish SMEs as they work to integrate big data technologies into their operations. The authors highlight the importance of digital capabilities for SMEs in maintaining competitiveness within the European market, particularly in sectors where data-driven decision-making is crucial. They note that, although big data holds significant potential for growth and innovation, many SMEs face a knowledge gap in understanding how to leverage it effectively. The chapter introduces the "KomDigital" initia-

tive, a learning framework designed to help SMEs develop the digital competencies needed for big data transformation. The authors outline four key learning domains: market understanding, technology application, business model innovation, and organizational processes. Through case studies of Danish SMEs, the chapter provides valuable insights into the managerial and organizational challenges these companies encounter, such as resistance to change, limited digital literacy, and the complexity of integrating data across business processes. Despite these challenges, the chapter underscores the transformative potential of big data for SMEs. It suggests that starting small, with focused experiments and realistic goals, can help SMEs gradually adopt big data technologies. The chapter concludes with practical advice for managers, emphasizing the need for a strategic approach to digital transformation that includes both technological investment and organizational learning.

Overall, Big Data in Small Business is a must-read for any SME aiming to remain competitive in today's data-driven environment. This book simplifies the complexities of big data into clear, practical steps that businesses of all sizes can easily implement. The real-world examples are especially valuable, as they effectively demonstrate how SMEs can leverage data to enhance efficiency, gain deeper customers insights, and unlock new revenue streams. Highly recommended for scholars, managers, and practitioners alike, the book's focus on the unique challenges and opportunities faced by SMEs offers tailored strategies that are both actionable and scalable, making it a remarkable resource in the field of big data for small businesses.