Digital Transformation

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The conceptual definition of digital transformation (DT) is composed of five corporate activities (AT Kearney) that increase a business's competitiveness in response to changes in the business environment, which are triggered by new digital technologies, such as big data (BD), artificial intelligence (AI), the Internet of things (IoT), smart factories (SF), cyber-physical systems (CPS), and interoperability (IOP). DT claims to maintain a sustainable business and positively impact overall business performance.

Keywords: sustainable growth ; sustainability ; SME ; business model ; digital transformation ; industry sectors

1. Introduction

With the evolution of technology, the primary trend of the world economy is the Industrial Revolution 4.0 (IR 4.0) as a new paradigm for sustainable growth. IR 4.0 technology has many advantages for manufacturing that allow for a more efficient and flexible production setup to target large-scale product customization without a loss-of competitiveness or increased production costs. Large enterprises have developed most of the current technology [1].

However, Imran et al. [1] mentioned that IR 4.0 is disconnected from the needs of small- and medium-sized enterprises (SMEs). Therefore, research is needed to support the sustainable survival and growth of SMEs.

From a DT perspective, other researchers have explained the disruptive impact that digital technology has on businesses, including corporate strategy [2][3], innovation [4][5], and business models [6][7][8]. It is emphasized that DT is not a one-off project; it is a continuous transformation and an evolutionary process [9][10]. The rapid development of information and communication technology (ICT) in recent years has emphasized the importance of the concept of a business model (BM) in the field of information systems (IS). DT refers to innovativeness [11], financial performance [12], and organizational growth [13].

Moreover, some organizational performance improvements, including reputation [14][15], were also associated with a company's competitive advantage [16]. DT is a new business opportunity. Eisingerich and Bell [17] demonstrated that DT enables companies to use digital capabilities to create new BMs, products, and services. They argued that this is an ongoing process that adapts to the customer or market changes and drives innovative change. The digital age is fundamentally changing the way our society and businesses operate. Business model innovation (BMI) has become a fundamental function to survive competition, especially for SMEs. Digital technology is a powerful force that is pushing companies to embrace new BMs [18][19], making innovation increasingly relevant [20][21][22].

The digital age and Industry 4.0 paradigm combine disparate technologies and open up unexpected possibilities, creating fundamentally new products and services and providing the potential to share knowledge between multiple actors in the technology ecosystem [23]. Industry 4.0 also creates innovative BMs [24][25]. BMI represents a new system of activities for a company [26] and an innovative structure for value creation and value capture [21] in which a single company and its alliance partners and customers [27] participate. The role of BMI has been discussed theoretically; however, empirical studies still lack mentions of SMEs [28].

Thus, the researchers identified that DT may be linked to influencing BMs and BMI as a basic function for surviving competition in SMEs. The term business model (BM) was first used decades ago [29]. The term "business model" refers to the intermediary structure between technological artifacts and the achievement of strategic goals and objectives, including creating essential economic value. Similarly, Kamoun [30] argued that a "BM becomes a blueprint for how businesses create and capture value in new services, products, or innovations" (p. 638). Following this approach, Yuan and Zhang [31] argued that it is not the technological application itself, but the BM behind technology artifacts, that achieves success and enables high-tech enterprises to achieve their strategic goals and objectives.

In a study on the structural causal relationship between DT and performance , DT was found to affect business models. Park argued that the BM involves a company's operational performance and corporate performance. Oderanti and Li [22] [32] proposed a new framework that was more subdivided and extended. The BM framework begins with a value proposition, including product offerings, target market segments, and revenue models, to reflect the vision and strategy. A BM states that financial sustainability and stakeholder confidence are evaluated [22][32].

A BM can define value as a company's rationale for sensing, creating, distributing, and acquiring. It explains how companies make money now and in the future, and it is BMI that changes the BM to a competitive position and improves performance. The activities of an enterprise's suborganizations aim to enhance the performance of the enterprise [33][34]. Furthermore, they strive to create new value by utilizing existing strategic resources [35]. It has been argued that companies are using digital technologies, such as the IoT, cloud, big data, and AI, to create new products and services, as well as BM changes .

2. DT, BM and Sustainable Growth

The BM theme complements the effects of each company, industry, and country on corporate performance by conditioning fluctuations in corporate performance [36][37][38][39]. Four distinct themes have been proposed: novelty, efficiency, complementarity, and fixation [22][40][41][42]. There is no research on how the industry is changing due to BMI through changing BM themes [43][44][45]. Velu [46] distinguished other forms of organizational elements: management innovation and BMI.

A BM summarizes the architecture and logic of the business and defines an organization's value proposition and approach to value creation and value capture. In doing so, a BM serves as a vehicle for converting the benefits of technology through the marketplace into customer value. BM innovation articulates changes in the means of value creation and capture. BM innovation can often include management innovation. However, it can improve performance by implementing management innovation in the existing BM.

The industry 4.0 concept in digital technology [47], originating from the manufacturing industry, provides the ability to implement efficiency gains within the manufacturing process through BMs, such as identifying and tracking materials within the industrial supply chain [45]. Rajput and Singh [48] argued that implementing circular economic principles in an enterprise's BM while supporting the view that digital technology supports value creation and capture and activates resource flow strategies is the value of Industry 4.0 technology, which was found to be a significant driver of innovation.

For a BM to be successful, it must be suitable for the ecosystem conditions, and therefore the viability of the applied BM configuration must be continuously monitored [49][50]. If nonconformities are identified, the BM should be adapted to the new ecosystem conditions [51][52][53]. This adjustment is called BMI. According to the BM literature, existing research on BMI provides a heterogeneous understanding of the phenomenon. BMI is defined as the gradual changes of individual components of the BM, expansion of existing BMs, and the introduction of parallel business models and potentially BMs [54]. Moreover, BMI needs to replace the old model with a radically different one.

While some scholars argue that BMI should be new to the industry [55], I follow a different strand of research claiming that BMI can be new to the company [56][57][58]. Recent research has advanced the focus from a static understanding of the business model to a dynamic view of the business model [58], its innovation [21][44][59], and its transformation [60][61]. Climent and Haftor [62] stated, stable industries exposed to relevant new technologies are more susceptible to being successfully destroyed by novel BM themes. According to the analysis results of previous studies, DT is recognized as essential for all companies and necessary for survival, regardless of being large versus small or medium-sized enterprises [18][19][24][25].

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