

Digital Business Models for Sustainability

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Abstract

The transformation of industry in the digital age forces the organization to rethink of their business model. It was a clear indication that digital transformation is spreading across even the most traditional industrial and creating an astonishing array of business opportunities and threats. The digitization of tasks and processes has become essential to competition in the current scenario. Every organization is aiming for more profitable business with digitally enabled and outcome-based business models. The purpose of this paper is to understand an improved way of modelling the digital transformation of businesses. It aims to causally connect components of business models with characteristics of digital technologies. This also results in better understand the impact of technology for digitally driven business model. The major technology that drive the business digitally are cloud computing, internet of things, machine learning, robotics, mobile technology and big data. Successful digital transformation goes hand in hand with reengineering and optimization of business processes in the most appropriate way for the strategy. It is inevitable to understand that the digital transformation is not going to stop, and companies will find themselves on an everlasting journey with the need to adapt, rethink and reshape constantly. Digital platforms come with the promise of exponential growth, scale through network effects and no assets needed. Research shows that emerging digital ecosystems could account for more than \$60 trillion in revenue by 2025. Digitalization radically transform business and society, destroying old business models and creating sustainable value.

Keywords: Business Model, Digitalization, Sustainability, Transformation, Industry 4.0

Introduction

Industry structures and business models are being disrupted by innovation in new products and services, changing cost structures, lower barriers to entry and shifting value pools. Companies need to re-imagine how to create, distribute and capture value in this new environment. Navigation requires holistic and sustained insight & intelligence (World Economic Forum, 2019). Digitalization has made transition for most of the business. The pace of acceleration associated with the digitalization is affecting organizations worldwide. Digital Technology is determining the day to day life of every organization. Across industries, the business world and the private sector, digitization has become a massive phenomenon where traditional products are replaced with digital counterparts – or at least equipped with new digital features. It has become evident in many sectors that digitization goes far beyond improving products, services, and production processes (Prem, 2015).

Digitization is a megatrend in its early days, jeopardizing existing businesses and promising extensive opportunities at the same time. Digitization processes have become part of every

aspect of business with a major impact on business growth and sustainability. A significant challenge of digitization is that it is not restricted to a certain industry or business (Bleicher & Stanley, 2016). In order to avoid shrinking profitability and to make effective decisions, companies need to understand the significance and scale of changes caused by digitization. Business models need to be adapted in order to integrate these rapidly developing digital processes and to translate them into value and economic success (Bleicher & Stanley, 2016).

Purpose

The ongoing development of information technology creates new and immensely complex environments. Our lifeworld is drastically influenced by these developments. The way information technology is intertwined in our daily life raises new issues concerning the possibility of understanding these new configurations (Stolterman & Fors, 2004). It was a clear indication that digital transformation and connection are spreading across even the most traditional industrial segments and creating a staggering array of business opportunities and threats. The digitization of tasks and processes has become essential to competition (Iansiti & Lakhani, 2014).

Business models change, it is not always straightforward to fully understand the features driving business model innovation arising from digitization (Prem, 2015). The growing adoption of information and communication technology (ICT) in all areas of the economy is changing the way goods are produced, distributed and consumed (Hamidian & Kraijo, 2013). This change is denoted by the term ‘digital transformation’ which is understood as “the changes that the digital technology causes or influences in all aspects of human life” (Stolterman & Fors, 2004). For businesses, it is about integrating digital technology into all functions, fundamentally transforming the way they operate and deliver value to customers.

With the digital transformation being one of the most discussed topics in the business world today, many enterprises – especially small and medium sized ones – find themselves struggling with the understanding of new digital technologies and thus the potential benefits and risks for their companies. New technologies like the Internet of Things, Blockchain, Cloud Computing, Robotics, Mobile Technology and Machine Learning have great potential for businesses (Kinitzki, et al, 2018). The purpose of this paper is to understand an improved way of modelling the digital transformation of businesses. It aims to causally connect components of business models with characteristics of digital technologies. This also results in better understand the impact of technology for digitally driven business model.

Literature Review

As early as 1982, Curran and Mitchell described our fast-changing world and its impact on managers: They are obliged to foresee the impact of technological developments on their companies and identify opportunities and threats in time. The authors describe “a basic understanding of technology’s far-reaching scope” as crucial to managers in order keep up with the transformation of the business world. (Curran and Mitchell 1982) Since then, the pace of change has only increased further, and the perception of information technology shifted from

being purely supportive to be an enabler of new business models (Châlons and Dufft 2017). The existing digital transformation process models found in literature assume a certain degree of digital maturity and expertise (Kinitzki, et al, 2018).

The digital transformation of business models relates to individual business model elements, the entire business model, value-added chains, as well as the networking of different actors in a value-added network. The degree of the digital transformation includes the incremental (marginal) as well as the radical (fundamental) change of a business model (Schallmo, 2016). After having emphasized the distinct characteristics of digital artifacts, digitization and thereby the nature of digital technology as well as the generativity that is created by digital technology, there is a solid conceptual basis for understanding the impact and challenges for an industry facing digitalization. This phenomenon has recently been intensively discussed in applied managerial literature and science but surprisingly enough a commonly accepted or clear definition and understanding are still missing (Bounfour, 2016; Hanelt et al., 2015).

The Fourth Industrial Revolution is rapidly driving transformational disruption across every sector. By 2022, over 60% of global GDP will be digitized. An estimated 70% of new value created in the economy over the next decade will be based on digitally enabled platforms. Currently, about 50% of the world's population does not currently participate in the digital economy at all and growth in internet adoption is slowing. The G20's Global Infrastructure Hub estimates a global funding shortfall of nearly \$1 trillion for information and communications technology infrastructure by 2040 (World Economic Forum, 2019).

Phases of Digital Business Model

Schallmo and Williams (2018) for instance, present a roadmap for the development of digital business models. It synthesizes existing transformation approaches and consists of five phases: Digital Reality, Digital Ambition, Digital Potential, Digital Fit and Digital Implementation.

1. **Digital Reality:** In this phase, Digital Reality, the company's existing business model is sketched along with a value-added analysis related to stakeholders and a survey of customer requirements. This provides an understanding of the Digital Reality for this company in different areas.
2. **Digital Ambition:** Based on the Digital Reality, objectives with regards to digital transformation are defined. These objectives relate to time, finances, space, and quality. Digital Ambition postulates which objectives should be considered for the business model and its elements. Subsequently, objectives and business model dimensions are prioritized.
3. **Digital Potential:** Within this Digital Potential phase, best practices and enablers for the DT are established. This serves as a starting point in terms of Digital Potential and the design of a future digital business model. For this purpose, different options are derived for each business model element and combined logically.
4. **Digital Fit:** The Digital Fit phase looks at options for the design of the digital business model, which are evaluated to determine Digital Fit with the existing business model.

This ensures that one fulfils customer requirements and that business objectives are achieved. The evaluated combinations are then prioritized.

5. **Digital Implementation:** Digital Implementation includes the finalization and implementation of the digital business model. The various combinations of options are further pursued within a digital implementation framework. The Digital Implementation also includes the design of a digital customer experience and digital value-creation network that describe integration with partners. In addition, resources and capabilities are also identified in this phase.

Emerging Technology for Digitally driven Business Models

A useful characterization of business model and value creation changes triggered by digitization is presented in Roland Berger (2015). It describes four 'leverages and triggers' resulting from digitization:

1. Collection, processing, and analysis of digital data, e.g.: Big Data, Internet-of-Things, wearables etc.
2. Automating value-adding activities and products, e.g.: robotics, autonomous vehicles, additive manufacturing, etc.
3. Networking of previously independent systems, e.g.: cloud computing, digital products, etc.
4. Creation of direct customer access for intermediaries via (mobile) online interfaces, e.g.: mobile internet/apps, social networks, e-commerce etc.

Schwertner (2017) suggest that the digitization of processes opens up many opportunities for expanding business and for its internationalization / globalization. The major technology that drive the business digitally are cloud computing, internet of things, machine learning, robotics, mobile technology and big data.

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing is a new technology for the enterprises. Companies in all vertical markets and company sizes will increasingly rely on public cloud services (Schwertner 2017).

The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items – embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Mobile Technology is important part of the digital transformation technologies. The use of mobile technologies in business and the current level of integration between technologies entirely caused by the needs of the enterprise and focused on optimal business processes management.

Big Data and Data Analysis - The volume of business data (terabytes and increasingly petabytes of information) suggests why managing and analyzing it is a challenge. It's no longer efficient for data warehouses (DWs) to manage single, homogenous workloads.

Block Chain is a promising technology at the coordination level and a potential infrastructure for facilitating interorganizational business processes. Its key strength is that it supports transactions between parties that do not trust each other over a computer network in which trust emerges from a combination of peer-to-peer technologies, consensus making, cryptography, and market mechanisms (Mendling et al., 2018).

Machine learning is a branch of the artificial intelligence research area. One prominent category of machine learning applications is classification. It might also help to coordinate different tasks in a business process (Mendling et al., 2018).

Robotic process automation (RPA) is an industrial response to the huge amount of manual work that individuals perform on a daily, weekly, or monthly basis to support a broad array of high- Volume business processing (Mendling et al., 2018).

Digitally Driven Business

The characteristics and success factors of established business models are fundamentally different to digitally driven business models as follows (Kolbenschlager, 2019)

TRADITIONAL ORGANISATIONS		DIGITAL ORGANISATION
Stability	Characteristic	Flexibility
Resources and processes	Targets	Customer experiences
Cost/piece	Control variables	Customer basis and motivation
Top-down on basis of planning and approvals	Responsibility	Bottom-up through continuous learning and improvement
A lot in-house, a few main suppliers, long-term partnerships	Sourcing	Networks, partnerships, spontaneous short-term co-operation
Long-term (months and years)	Timescale	Short-term (days and weeks)

Source: Adopted from Kolbenschlager, 2019

Implication

Kolbenschlager (2019) expect digitalization to have a fundamental and lasting effect on society which is comparable to the invention of the steam engine, the introduction of assembly line production or the globalization of the business. The media frequently limits digitalization as an IT or high-tech subject. In-fact digitalization is not a current IT trend or hype. It is a development which gives entrepreneurs enormous opportunities, but which also comes with a number of challenges.

Digital Business Transformation is disrupting businesses in every industry by breaking down barriers between people, businesses and things. By breaking these barriers, they are able to create new products, services and find more efficient ways of doing business. These innovations are happening across organizations of all types, in every industry (Schwertner, 2017). Being innovative and transforming into the digital age is often reduced to the

implementation of new technologies. But there is no digital transformation without appropriate business transformation and the consequences of ignoring or escaping the trend become very clear with examples like Kodak, where the company was unable to make a transition into digital thinking, causing its own downfall due to the disruptive character of digital photography (Kinitzki, et al, 2018). The main challenge of the digitization of companies are not technologies, but human factors, cultural traditions, employees' resistance to change, lack of relevant knowledge and good practices, lack of adequate resources, lack of motivation and risk taking (Schwertner, 2017).

Digital business transformation is the integration of new digital technologies into all business areas, leading to a fundamental change in the way the organization works. In digital transformation, it is not enough to use as many technologies as possible. The strategy is moving, it must have a clear vision for the company's development, and then be supported by the unlimited possibilities of these technologies that are related to the chosen strategy. Successful digital transformation goes hand in hand with reengineering and optimization of business processes in the most appropriate way for the strategy. The digital transformation of the business seems different for different companies and it is difficult to give a strategy that is valid for everyone (Schwertner, 2017).

A digital business model is expected to enlarge the existing business pie by attracting new customers or encouraging the existing customers to consume more. Digitization and the spread of the internet have given rise to newer business models, resulting in varying levels of efficiency in the delivery of products or services in internet markets (Rojers, 2018). For the private sector, digital platforms come with the promise of exponential growth, scale through network effects and no assets needed. Research shows that emerging digital ecosystems could account for more than \$60 trillion in revenue by 2025 (or more than 30% of global corporate revenue), and yet only 3% of established companies have adopted an active platform strategy. For the public sector, digital platforms and ecosystems are designed as core strategic elements for smart cities and smart nations (World Economic Forum, 2019). It is inevitable to understand that the digital transformation is not going to stop, and companies will find themselves on an everlasting journey with the need to adapt, rethink and reshape constantly. A proper technological understanding and awareness is crucial to remain competitive (Kinitzki, et al, 2018).

Conclusion

With all the new opportunities and challenges emerging from the digital transformation, ignoring it puts organizations at risk of falling behind the competition. However, properly evaluating and selecting the right technologies as drivers of the transformation presents great challenges to businesses. Especially small and medium-sized enterprises find themselves struggling due to the lack of financial and human resources limiting the possibility of trial and error approaches on being innovative. Decision makers are often left alone with the digitalization as result of these conditions. Digital business transformation can only be successful if there is a well-founded strategy and leadership. Transformational changes are

required to implement the digital transformation, which is related to strategy, leadership and organizational culture (Schwertner, 2017). Business model approaches become more valuable when they strategically incorporate digital success factors, facilitate decision-making processes and enable management teams to translate digital trends into innovative and profitable business practices (Bleicher & Stanley, 2016). Digitalization radically transform business and society, destroying old business models and creating sustainable value.

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