



Digital Transformation and Value Creation: Sea Change Ahead

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The nature of digital transformation: What exactly are we up to?

Digital transformation is taking place all around us and there is hardly a single aspect of life that has not been affected. In a traditional sense, digital transformation refers to the use of computer and internet technology for a more efficient and effective economic value creation process. In a broader sense, it refers to the changes that new technology has on the whole; on how we operate, interact, and configure, and how wealth is created within this system. It has become clear by now that the digital transformation has an obvious, lasting, and even revolutionary impact, not only on the economic systems and commercial players, but increasingly on the lives of individuals and on society at large:

It lowers the cost of interaction. /// All economic systems and market interactions result in costs for information exchange, coordination, safeguarding, enforcing, etc. Digitalization will lower these costs and therefore unleash value; the more exchanges, the higher the potential benefits. More accessible information will reduce information asymmetry between market participants, which will in turn make markets more fluid and influence competition.

The structure of information exchange will change considerably.

/// We are moving from a predominantly unilateral and bilateral exchange towards a networked form of exchange. In other words, individuals and market participants will be involved in a multitude of exchange networks that easily form, grow, and then dissolve again. As a result, the number of connections in economic and societal systems will grow exponentially.

TABLE 1:
Overview of potential digitalization benefits and risks

	BENEFITS	RISKS, COST AND CHALLENGES
	OF DIGITALIZATION	
CUSTOMERS	NEW PRODUCTS AND SERVICES, GREATER CONVENIENCE, MORE CHOICE, NEW EXPERIENCES, LOWER PRICES	COST OF LEARNING, COST FOR INFORMATION SEARCH, ACTIVITY OVERLOAD, LOSS OF PRIVACY, PERFORMANCE UNCERTAINTY
COMPANIES	GREATER EFFICIENCY AND EFFECTIVENESS, OPPORTUNITIES TO CREATE NEW VALUE AND ENTER NEW MARKETS	LOSS OF EXISTING VALUE CHAIN CONFIGURATIONS, NEW COMPETITORS, FASTER INNOVATION CYCLES, NEW TECHNOLOGIES
INDIVIDUALS	MORE FLEXIBLE WORK MODELS, GREATER WORK PARTICIPATION, MORE FLEXIBLE LIFESTYLES, OPPORTUNITIES FOR CROWDSOURCING AND CROWDWORKING, EASIER SHARING AND RENTING	AUTOMATION TAKES OVER REPETITIVE AND EVEN SKILLFUL TASKS AND REPLACES THE HUMAN WORKFORCE
SOCIETY	MORE EFFICIENT AND EFFECTIVE PUBLIC ADMINISTRATION, BETTER PUBLIC SERVICES	PRIVACY AND DATA PROTECTION, OLIGOPOLISTIC OR MONOPOLISTIC MARKET STRUCTURES, CHALLENGES FOR TAXATION AND REGULATION

It produces massive amounts of data. /// The constantly growing computing power and strongly distributed nature of computing capacity leads to so called Big Data. Predictions by Cisco Systems suggest that Internet traffic in 2016 will be around 1 Zettabyte (1×10^{21} bytes). In comparison, the information contained in all books worldwide comprises about 480 terabytes (5×10^{14} bytes) and a text transcript of all the words ever spoken by humans would represent about 5 Exabytes (5×10^{18} bytes), according to a 2003 study conducted by the UC Berkeley School of Information. In this environment, data is accessible everywhere and in real time, which leads to enormous data processing, storage, and retrieval operations. A key challenge is to analyze and interpret patterns in these large data volumes and to gain insights for actionable decisions.

It is irreversible and will go on. /// The digital transformation is pervading and transforming our daily lives fundamentally. Moreover, the developments so far are irreversible.

The core driver of these changes is the underlying computing technology. The cost of computation has been declining at an accelerating rate. While the annual cost decline between 1945 and 1980 was on average 37%, these costs declined even more rapidly with an average annual rate of 64% during the 1980s and 1990s, according to Yale professor Nordhaus. As computing power and capacity continue to grow exponentially, and will continue to do so at least within the next decade, the underlying forces will continue their impact.

New value – at a cost

Digital transformation is expected to bring greater tangible and intangible value. Given the apparent changes, this promise should easily materialize. At the same time, the changes do come with certain costs and risks, sometimes unforeseen. It is thus important to understand the opportunities and potential challenges surrounding value creation in digital environments for the various groups. We will more or less all be affected and not one stone will remain unturned.

{ Box 1 }

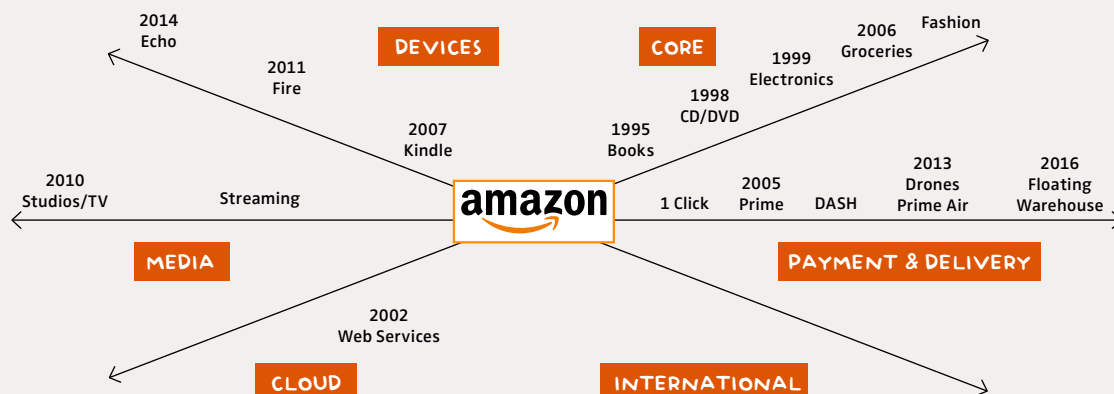


AMAZON: EVEN YOUNG COMPANIES NEED TO KEEP REINVENTING THEMSELVES

Since its beginnings in 1994 as an e-commerce pioneer selling books and CDs online, Amazon has had to continually transform itself to grow. It has not only expanded its core business by now selling almost everything from electronics to fashion to groceries, but has also evolved into new business areas. Some of those even threatened its own core business: Despite selling physical books, Amazon also introduced the Kindle and eBooks. In addition, it is threatening other businesses like Netflix and TV networks. Also, it became a leader in cloud services and is hugely profitable in this field. Amazon Web Services generates annual revenues of \$10 billion and margins in excess of 80%. It is already bigger than the next four cloud service companies – Microsoft, IBM, Google and Salesforce – combined, and is still growing at 50% annually. Figure 1 illustrates how Amazon kept moving in new business areas over the last 10 years.

One of the lessons from the digital transformation of Amazon is that in this fast changing digital market place, resisting innovation is not an option. Even if some of the innovations fail, as was the case with Amazon's smart-phone Fire, you have to keep going. Companies need to cultivate a tolerance for risk and allow themselves to make mistakes. Other lessons for successful transformation are the ability and willingness to go beyond one's core business and the willingness to potentially cannibalize parts of oneself. Amazon's Kindle and offering of eBooks now outsell physical books, and with better profit margins.

FIGURE 1:
How Amazon took advantage of digitalization to
transform its business and grow



Net sales of books and merchandise in 1995 was \$511,000 and \$148 million in 1997. In 2016, Amazon was selling about 969,000 print books and 1,064,000 eBooks a day. This translates to annual sales of \$3.5 billion and \$2.1 billion respectively.

Customers. /// For the commercial engagement of customers, the digital transformation brings greater transparency, less information asymmetry, and new customer benefits such as new products and services, greater convenience, more choice, new experiences, and lower prices. At the same time, these opportunities are accompanied by potential costs such as cognitive and/or tangible investments, learning, information and activity overload, and risks such as loss of privacy and performance uncertainty.

Companies. /// In business the digital transformation brings greater efficiency and effectiveness of existing value chains, the realignment of value chains, and opportunities to create new value. At the same time, the challenge for incumbents is the potential – and likely – substitution of their core business. The traditional boundaries of companies are evolving – companies may shrink or expand. Furthermore, the competitive landscape is evolving and new competitors,

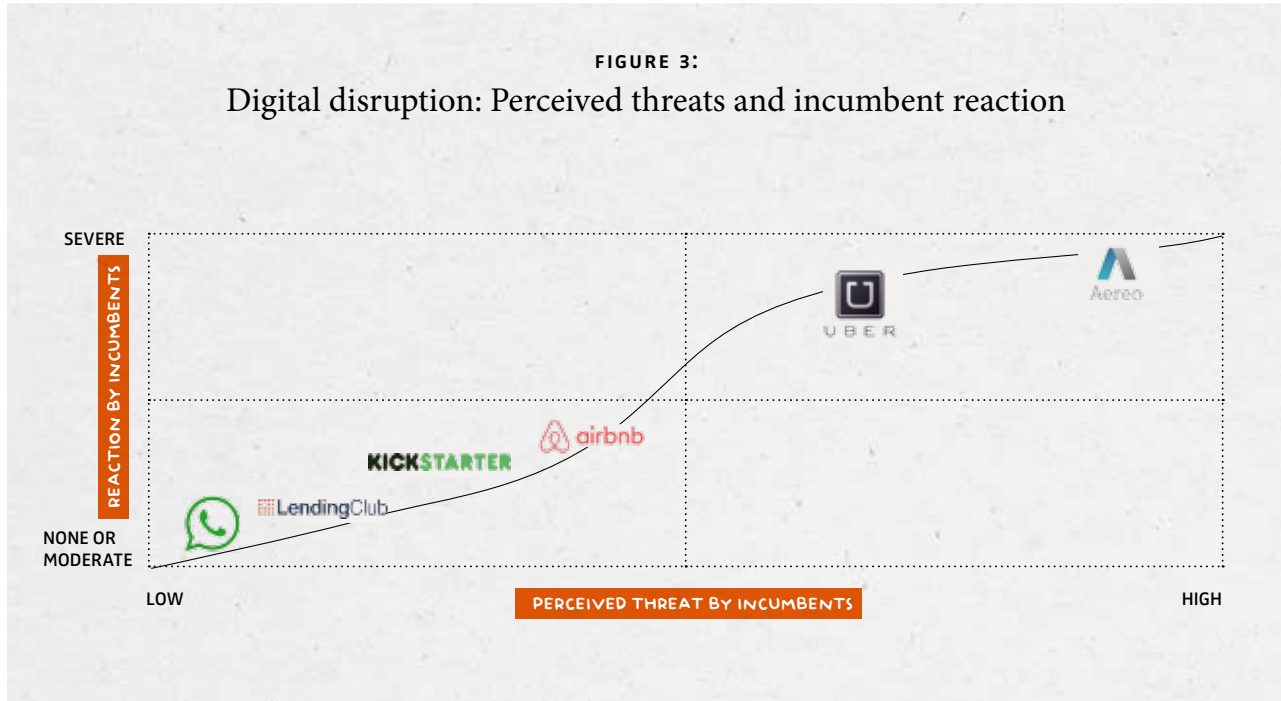
often from adjacent or even different industries, are now emerging. In addition, the rate of innovation, R&D cycles and product and production cycles is increasing due to customer demands and technological opportunities. Finally, the complexity of operations is surging due to higher speed and the integration of new technology like machine to machine communication or the Internet-of-Things.

Individuals. /// Aside from the commercial advantages, the ongoing transformation is likely to change the nature of employment and physical lifestyles. Digitalization will change the traditionally rigid 8-5 work model and allow for more flexibility in terms of time and place for an increasing share of employed and self-employed people. In addition, individuals will have greater work participation opportunities via crowd-sourcing and crowdsourcing platforms. At the same time, automation will not only supplant simple, repetitive, and dull work routines but will also comprise more and more “skillful

FIGURE 2:
Digital disruptors in different industries



FIGURE 3:
Digital disruption: Perceived threats and incumbent reaction



tasks.” Computational machines will be able to accomplish complex activities with high accuracy in ways that had thus not been deemed possible. In terms of lifestyle, sharing and renting will be much easier and is becoming a viable alternative to owning physical goods.

Society. /// Lastly, the digital transformation potentially brings value for society at large. It enables more efficient and effective public administration processes and services in terms of providing effective health care, effective city management, and coping with an aging society. At the same time, the digital transformation presents completely untested challenges with respect to privacy and data protection – at all levels – that are in dire need for new answers. In addition, one can observe the emergence of certain oligopolistic market structures such as platforms. With all their advantages such as efficiency and global scale, they also carry problems. Potential monopolistic structures may develop and the integrity of taxation might be an issue. In these cases, the net impact on social prosperity still needs to be established. The role that regulation takes with regard to these dynamic developments currently remains entirely open.

Transform yourself or face disruption?

In terms of business strategy, digital technology has been transforming businesses dramatically. In some cases, it has provided companies opportunities to reinvent themselves: GE became the “Digital Industrial Company”; Netflix offered

streaming instead of renting out DVDs. In other cases, it has threatened or ended companies’ existence, as was the case with Kodak and Xerox. Even “business-youngsters” who were at the forefront of the digital disruption two decades ago are forced to reinvent and transform themselves and their businesses permanently in order to survive and thrive. A case in point is Amazon (see Box 1).

Digital Disruptors and incumbents’ reactions /// If incumbents themselves don’t use digital progress to innovate, others will – and fast. A new wave of digital disruptors and digital start-ups is changing the face of established industries with new technology. Uber is the iconic company that is often cited as the prime example of a digital upstart that has challenged the taxi industry, but Uber is not alone in this: Airbnb is challenging the hospitality industry; crowdfunding companies like Kickstarter are challenging the venture capital industry, and peer to peer lending pioneers like Prosper, LendingClub and OnDeck are challenging some of the traditional functions of the banking industry. All of these technology-based companies have unique features that challenge the status-quo of how business is conducted in established industries.

The researchers Lee and Teo identified five factors – Low margin, Asset-light, Scalable, Innovative and Compliance-easy, which they named LASIC principles – that characterize these new companies and how successful they will be. They suggest

{ Box 2 }

FIGHT BACK – OR NO? DIFFERENT REACTIONS IN DIFFERENT INDUSTRIES

One example where the established players reacted severely was in the case of **Aereo**. This New York City based technology company developed technology that allowed users to access over-the-air (OTA) HD programs on their internet-connected devices, using a miniature antenna that subscribers rent for a small monthly fee. American Broadcast companies felt this to be an existential threat and battled Aereo in court. After a series of court rulings that were made in favor of Aereo, the US Supreme Court ruled against Aereo for violating copyright laws. Aereo was forced to shut down its operations and broadcasters breathed a sigh of relief.

Uber posed a threat to the taxi industry and has faced continuous opposition in most of the cities in which its services have been launched. The perceived threat for small and fragmented taxi and limousine operators was high. They have organized opposition against Uber, sometimes with the help of regulators, but many times without much success. The difference in this case compared to the case of Aereo is that the broadcast industry was more concentrated with big and well-resourced players. In contrast, the taxi industry is localized, small and greatly lacking resources.

On the other hand, **LendingClub**, the peer-to-peer lending platform, which issued over \$9 billion in loans in 2016, received very little attention from the banking industry since it began its operations in 2009. Many banks consider it a drop in the ocean of their consumer lending business of \$3 trillion (in the US) and don't see peer-to-peer lending as a threat – yet!

The Telecom industry has ignored the threat that **WhatsApp** has posed to their messaging business and are, as a result, paying a dear price for it.

that disruptive companies can operate on low margins and have the ability to scale up fast in order to derive profit due to volume. A critical factor in the new disruptive technologies is their asset-light structure. It makes them agile and enables the focus to be placed on technology in order to improve user experience. Innovation of the technology in terms of providing differentiated value is obviously important. As technologies rapidly evolve, they challenge the traditional regulations, which they argue are outdated. In many cases, regulation catches up much later, creating hurdles for the disruptors. It is thus important for these disruptive companies to be either compliant or to work with the regulators and other stakeholders in order to survive and thrive.

And how are the established players in these industries reacting to the challenges and threats that these disruptors are posing and why are they reacting the way they do?

It appears that players in some industries are reacting aggressively and are using different means such as legal measures, regulatory influence, or their own innovation, while others are ignoring these. The reaction or lack thereof appears to depend on how disruptive the incumbents assume the new player will be. If they feel safe in their offering due to their size, existing regulation or assumed customer inertia, the incumbents tend to ignore the threat. If they perceive the new entrant to pose an existential threat, they react fiercely (see Figure 3 and Box 2).

How to survive ongoing digital transformation /// This whole issue deals with important aspects of digital transformation and contains valuable insights on how to be successful despite or precisely because of the massive changes. The key recommendations of our select group of researchers and authors from around the globe are as follows:

> **Don't just scratch the surface** /// To become or remain successful, it is not enough to offer a new app or a web shop on top of one's existing business or an old idea. Often, it is the whole business model that needs to be new or reinvented to create real value. In their article (pp. 18), Christoph Zott and Raphael Amit describe how the entire activity system of a company can be reconfigured and which value drivers exist. With Pokémon Go, they demonstrate the profound change necessary to generate a value that hits home in a digital world. In fact, the very basic principles of doing business have changed. The digital world is no longer strictly resource-dominated. Marshall Van Alstyne and Geoffrey Parker describe how platforms are becoming major players (pp. 24). In a platform-domi-



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nated world, managing relationships is far more important than owning and controlling tangible resources: Uber connects drivers and riders without actually owning any cars, and Airbnb connects hosts and guests without owning any rooms. Scale and value come from the number of external participants, and these join if they get back a fair share of that value.

> **Innovate – first your mindset, then your actions** /// When everything is new, business ideas need to be new as well. The ability to innovate is therefore more important than ever. Probably, one of the hardest parts is changing one's mindset and avoiding mental lock-in. Assets and success patterns from the past can turn into traps because they foreclose real change. Based on their experience in the market research industry, among others, Andreas Neus, Fabian Buder and Fernando Galdino from GfK offer ideas on how to fight blindness to innovation (pp. 30). New ways of decision making and innovation prepare the ground for future success, as demonstrated by Beiersdorf, the Nivea Company. In our interview, Martin Wulle, who is responsible for global digitalization and e-commerce, illustrates how the company introduces digital thinking to their global, 130-year old business (pp. 58). For a skin-care company, communication in the social media age is a big challenge, and although the media landscape is changing, the essence of their brands needs to be preserved in a re-enacted way. Digital forms of advertising are also a topic discussed by Bruce I. Norris, who presents recent findings on the effectiveness of different forms of banner ads (pp. 53).

> **Speed up** /// Digital change is happening and it is happening fast. Entire industries will be threatened if they do not react quickly, while others are emerging instantly as if out of nowhere. Traditional retailing, for instance, urgently needs to find its position before digital retailers and other parties take over all their traditional roles. Werner Reinartz and Monika Imschloß discuss the challenges and solutions in this field in their article on pp. 42.

Crowdfunding, on the other hand, is an industry that was virtually non-existent only five years ago. In 2015, its volume already surpassed that of the venture capitalist industry. Srinivas K. Reddy and Yee Heng Tan explain how this fast growing field works and what chances it offers to different market participants (pp. 36). Anil Menon, Global President of Cisco, uses the example of global city growth to illustrate how digital solutions can help governments and societies in handling this pressing issue (pp. 48). In this delicate field, keeping the pace of the inflowing crowds and supplying at least basic services in more and more mega-cities is even a matter of social peace. Handling speed and providing real-time solutions is therefore one of the most critical skills in a digital world.

There is no doubt that we are living in turbulent times, but those who are willing to take some risk and who understand the basic principles of digital change and the impact of technologies will see a bright future. When the sea changes, skillful sailors will still be able to safely steer their boats into new harbors – hopefully into a better world for all of us.

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