

Kapitel 2:

Digitale Transformation

The Third Technology Revolution

Possible Future Worlds and the New Self

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Over the last 250 years, the world has experienced two technology-driven economic revolutions that have drastically changed how people live, work, and communicate. The first revolution (commonly referred to as the Industrial Revolution), which occurred approximately between 1760 and 1830, led to the transition of manufacturing from handcraft production to machines in key industries such as textiles and to increased efficiency in using energy and power. The second economic revolution between the second half of the 19th century until World War I (appropriately referred to as the Technological Revolution) was characterized by the building of railways, the beginning of electricity and electrical means of communication such as telegraph, telephone and radio as well as mass production and the production line (e.g. for automobiles).

Certain inventions were critical for the start of these revolutions – for example, the mechanical spinning wheel for the Industrial Revolution, which increased productivity by a factor of about 1000, and electricity for the Technological Revolution, which changed the face of factories and cities. Both revolutions resulted in unprecedented sustainable development and growth in the countries at the centre of these revolutions, that is, Great Britain, Germany, other parts of Western Europe, the United States, and Japan. Both revolutions also greatly improved living standards and life expectancies. In fact, the consequences of these two technology-led economic revolutions were felt throughout the 20th century as economies transformed from agricultural to industrial and, ultimately, service economies. They are felt to this day, for example, in terms of the enormous growth that China has experienced over the past 20 years.

We are now in the midst of the third technology revolution, or what *The Economist* in a recent special report on the world economy has called “the third great wave” (Avent, 2014). At the core of this wave are once again certain inventions and technologies (or rather “technology clusters”). As in the previous two revolutions, these technologies are likely to radically transform the economies where the relevant inventions are made or are first

adopted and commercialized, and this time a much wider set of countries may be involved. Most importantly, these technologies will change how people live, work and communicate, and how certain domains (such as healthcare, retailing, or travel) will develop. Most importantly, these technologies will result in an entirely new concept of ourselves – who we are and how we relate to others and the world.

1 Key Technology Clusters

At the centre of the “third great wave” will be the following broad-based technology clusters.

1. **Digital technologies:** Over the last twenty years we have witnessed the fast adoption of many digital technologies including the internet, mobile communications, cloud computing, social media, and “big data”. To characterize digital technologies and their advantages, Nicholas Negroponte, in his 1995 book *Being Digital*, used the metaphor of a shift from “atoms” to “bits”. Atoms have mass; they consist of materials and need to be transported. “Bits” are weightless, virtual, and allow for instant global movement. The prior two technological revolutions may be characterized primarily as increasing the efficiency of “atoms.” In contrast, the “digital revolution” using “bits” seems to be an even more radical revolution. Digital technologies provide a global infrastructure through which people and organizations can share information, collaborate, interact, and communicate.
2. **The Internet of Things:** The next step of the “digital revolution” seems to be the move beyond “bits” to integrate digital technologies into solid (or “atomic”) devices. The so-called “Internet of Things” will embed smart computing systems into devices and connect them to the Internet. It is expected that approximately 30 billion devices will be on the Internet of Things via mobile devices by 2020. The embedded devices may be used in both B2C and B2B contexts. In B2B businesses, smart devices that report their own status (such as an engine that reports data on its usage) are expected to promote further automation in nearly all fields. B2C applications may include smart consumer appliances and home equipment, medical devices and implants, or smart devices in apparel. The Internet of Things is likely to generate massive data on consumer usage. It is also likely to raise numerous privacy issues.
3. **Human-machine interaction technologies:** The third set of revolutionary technologies emerges at the interface of the human body and intelligent machines. Consider robots: as automatic devices that resemble humans, robots have been used in the military or industrial production to perform dangerous or repetitive tasks, originally performed by humans, either alone or in collaboration with humans. As part of a new generation of robots with artificial intelligence, future robots are likely to be found as androids in services, healthcare, or elder care, for example. Moreover, prosthetic applications to replace an amputated arm or leg or implants to treat blindness as well as new advances in plastic surgery will increase the proliferation of human-computer, or brain-

computer, interfaces in the “cyborg” sphere. Finally, virtual reality and immersive multi-media devices will be able to create and simulate new multi-sensory experiences and imagined worlds.

The three technology clusters discussed above have already delivered numerous remarkable innovations: a multilingual, web-based, free-content encyclopaedia (as “Wiki” calls itself on its “Wiki page”); computer systems (such as IBM’s Watson) that outperform doctors on complicated diagnoses and lawyers in complex legal cases; unmanned automotive vehicles (such as “Google Car”) and drones; and many others. These technologies have also resulted in the creation of numerous successful, life-changing consumer businesses including Google, Amazon, Ebay, Facebook, and the like. More than that, in the coming years, these technologies will further transform industries and result in new consumer worlds.

2 Possible Future Worlds

I have coined the term “Possible Future Worlds” to refer to new consumer worlds at the interface of individual consumer behaviour, business, and technology. The concept explores, given the new technologies described, how consumers will live, move around, shop, interact, and connect with others over the next 10–25 years. It will examine what business opportunities are likely to arise, and what life spaces are likely to emerge. I am currently involved in a mega-project exploring such “Possible Future Worlds” for Asian consumers at the Institute on Asian Consumer Insight in Singapore. The overall structure of this large-scale project has been conceptualized by me, together with Professor Lewis Lim of Nanyang Technological University, but the project involves several other researchers as well.

Specifically, together with other researchers, we are investigating possible future consumer scenarios in five domains of life:

- Health, wellness and nutrition
- Shopping and consumer lifestyle
- Digital behaviour
- Urban life, mobility and sustainable living
- Travel and tourism

Here is a short overview of the questions we are asking and the issues we are researching in each domain.

Future Health, Wellness and Nutrition

Using the technologies discussed earlier, modern healthcare is moving towards technologically enabled systems such as remote treatment, self-diagnostics, and ad-hoc monitoring.

Additionally, digital media is increasingly seen as a means of disseminating information as well as treatment prescriptions to patients and consumers. Thus, what are the specific implications of digital technologies, the Internet of Things, and robotics for health-related behaviours and for consumer healthcare institutions? How will our perceptions of health change? What will be the key healthcare marketing devices, delivery systems, and post-treatment care facilities? What opportunities for businesses and consumers will arise in the changing landscape of modern healthcare?

Future Shopping and Consumer Lifestyle

With the advent of digital retail channels, businesses have to re-examine their strategies for managing consumers and the buyers' decision process. Modern retailers are now engaging consumers through so-called "omni-channels", that is, by adopting both online and offline channels. E-commerce itself is also still rapidly growing, with companies like Amazon and Alibaba making substantial investments to seize opportunities in the global consumer market. What new retail touch points will be created for consumers in the future? What new roles will retail stores play? Will stores be showrooms or brand experience spaces rather than shopping environments? How will cityscapes change as a result of changes in shopping?

Future Digital Behavior

Consumer interactions with technology have affected how various industries choose to market and convey their businesses, including healthcare, retail, and consumer goods. Research on future digital behaviour will delve deeply into digital behaviour and how it influences consumer purchase decisions. The research focus will include examining wearable technologies, digital media technologies, robotics, and augmented realities, and how they will be used as part of everyday digital consumer behaviour in the future.

Future Urban Life, Mobility and Sustainable Living

Future cityscapes globally are expected to become denser and more closely populated, and this will affect the lifestyle of tomorrow's consumers. While this may be happening less in Germany, it will be the dominant picture in most developing markets, especially in Asia, including the mega-cities in China, India, and Indonesia. As a result, smart solutions are needed in the planning of future cities. What will future mobility look like (both with private vehicles and public transportation systems)? Will future urban buildings only go upwards or also downwards, with large leisure and shopping malls underground? What will be the key information and orientation services of interest to urban dwellers?

Future Travel and Tourism

The modern consumer is more mobile than ever before, and travel is an important pastime. Technology has also affected how people travel and where they travel to. Travel technologies are providing firms with new opportunities to capture and influence consumers, as well as new possibilities as to travel destinations. For example, space travel may in the

near future become a commercial reality. Thus, how will consumers in the future make travel decisions? How will technology affect travel motivations, including new forms of tourism such as space tourism, gastronomy tours and special interest traveling?

There are other life domains where consumer behaviour will change due to new technologies. For them, too, we need to research and create Future Possible Worlds. In addition to new consumer worlds, another major shift is likely to occur, which will address our very nature as human beings: the emergence of the “New Self”.

3 The New Self

The technologies of the “third great wave” are about to change how we view ourselves, others, and the world. I am currently engaged, together with my colleague Professor Miklos Sarvary, in a “New Self” project at the Center on Global Brand Leadership at Columbia Business School in New York. In this project we set out the implications of the technology changes for our future selves as individuals and consumers.

We propose that the New Self, as a result of the digital technologies discussed earlier, will include an extended perception of “space-time” (e.g., a breakdown of the boundaries of well-defined spaces and times where work takes place; a diffusion of the separation of work and leisure time; and sharing of experiences across space and time). Moreover, body-machine technologies will alter fundamentally how we will think about our bodies; we will extend our externalities and body functions with technologies, having smart devices built into our bodies. And we will engage in new ways with objects that surround us in our private, “smart homes” and elsewhere as part of the Internet of Things. In addition, we will experience virtual worlds as part of our selves. Finally, the “New Self” will include a new concept of connectedness with others. For today’s Millennials, not being in touch 24/7 is considered rude and anti-social. Attention will be vastly divided rather than focused. Information and knowledge will be ubiquitous and easily reachable.

The New Self will take a fresh look on some of the most enduring philosophical, psychological, and consumer-focused issues. To begin with, once we are approaching what is called “technological singularity” (meaning that we will be able to create systems and robots that not only outperform humans in the speed of processing but also mimic them in decision-making, creativity, and emotionality), the question will arise “What is left for the human mind?” Moreover, once digitally-based systems will be fully embodied, we need to conceptualize and understand not only embodied cognition but also intelligent embodiment. Finally, in terms of consumer behaviour, we need to begin to understand how individuals and consumers will interact with smart objects as well as intelligent non-human agents.

In sum, the third technology revolution will usher in the most radical and most personal “paradigm shift” that mankind has seen so far. To experience the issues discussed here viscerally, rather than just cognitively, and to explore what is ahead, I recommend recent

science-fiction movies such as *Gravity* (where the benefits of space travel are beautifully illustrated), *Her* (where a computer and a user fall in love with each other), or *Transcendence* (where the entire consciousness of a person is uploaded into a computer to guarantee immortality).

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„Strategieren“ als Managementprinzip der digitalen Transformation

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Von den Titelthemen der einschlägigen Wirtschaftspresse bis zur jüngsten Hamburger Erklärung der deutschen Bundesregierung – die digitale Transformation wird zunehmend als zentrale wirtschaftliche und gesellschaftliche Herausforderung erkannt. Spätestens seit dem Niedergang von Quelle, Neckermann und Co. wurde auch dem letzten Top-Manager in Deutschland bewusst, dass aus einem Trend eine reale Bedrohung geworden ist. In der Konsequenz zeichnet sich eine Bewusstseinsveränderung ab, die darauf abzielt, „Digital“ als strategischen Schwerpunkt im Unternehmen zu verorten und den anstehenden Veränderungen damit eine entsprechende Priorisierung zu geben.

Dieser Schritt zwingt viele Unternehmen jedoch zu einem fundamentalen Hinterfragen des vorherrschenden Strategieverständnisses. In der klassischen Strategielehre überwiegt eine Perspektive, die immer noch im Kern an den Porter'schen Grundsätzen anknüpft. Strategie wird im Grunde als „stimmige Anordnung von Aktivitäten“ verstanden (Porter, 2014, S. 11). Unverrückbar ist in der klassischen Strategielehre, aber auch in der unternehmerischen Praxis, eine mehr oder weniger langfristige Perspektive, die eine Berechenbarkeit oder doch zumindest „Beplanbarkeit“ der Zukunft impliziert.

Doch genau diese Planbarkeit weicht im digitalen Umfeld insbesondere bei großen Organisationen einem taktischen Manövrieren, das immer wieder neue Prioritäten setzt. Getrieben durch einen dynamischen Wettbewerb (insbesondere durch Startups oder andere disruptive Anbieter), technische Innovation (etwa durch neue Software-/Kommunikationslösungen) oder veränderte Kundenbedürfnisse sind Unternehmen gezwungen, ihre bestehenden normativen Planungshorizonte zu verkürzen und ihre Strategien einem ständigen Review zu unterziehen.

Darüber hinaus erfordert der digitale Wandel Veränderungen, die über einen abgegrenzten funktionalen Bereich hinausgehen und weitreichende Konsequenzen für fast alle Unternehmensaktivitäten mit sich bringen (Pfeiffer & Aydin, 2013). Insbesondere wenn es darum geht, digitale Technologien für die Weiterentwicklung und Optimierung des eige-

nen Geschäftsmodells zu nutzen, spielt höchste Agilität im Erkennen und Bedienen von Kundenbedürfnissen und der Umsetzung nötiger Anpassungen eine zentrale Rolle (Jahn & Pfeiffer, 2014). Dafür braucht es einerseits flexible Prozesse, eine starke Trial-and-Error-Kultur, andererseits aber auch ein Strategieverständnis, das der sich fortlaufend ändernden Marktsituation gerecht werden muss.

Die von Mintzberg (1978) geprägte emergente Form der Strategie wird diesen Erfordernissen viel eher gerecht als ein klassischer Strategiebegriff. In der Realität heutiger Unternehmen zeigt sich die Balance zwischen emergenter und normativer Strategiefindung auch Jahrzehnte nach der wirtschaftswissenschaftlichen Thematisierung mehr denn je als zentrale Herausforderung. Das große Ganze nicht aus den Augen zu verlieren und dabei gleichzeitig definierte Freiräume zu schaffen, gestaltet sich dabei komplex. Häufig sind es Startups, die diesen Anforderungen am besten gerecht werden und im Rahmen sehr kurzer Modifikationszyklen neue Produkte testen und etablieren. So wird der dort praktizierte „Lean-Startup“-Ansatz (Ries, 2011) immer mehr auch zu einem Dogma für die Digital-Units großer Unternehmen und Konzerne.

1 Strategieren in der Produktentwicklung: Der Kunde als Co-Creator

Gerade im Innovationsmanagement zeigen sich oft radikale Veränderungen: So weichen standardisierte Stage-gate-Innovationsprozesse immer öfter einer konsequenten Trial-and-Error-Kultur. Und viele Unternehmen bringen immer öfter auch den Mut auf, mit „Minimum Viable Products“ den potenziellen Markterfolg zu testen (Blank, 2013), bevor das Neuprodukt im Massenmarkt ausgerollt wird. Schon seit Jahrzehnten propagierte Veränderungen in der Hersteller-Kunden-Beziehung, insbesondere hin zu einer Prosumenten-Ökonomie (Toffler, 1984), in der Kunden zu Co-Produzenten werden (Meyer, Blümelhuber, & Pfeiffer, 2000), sind heute immer öfter Teil der täglichen Praxis.

Während also früher häufig lange und aus dem Unternehmensinneren heraus getriebene Innovations- und Investitionsprozesse notwendig waren, um sich Wettbewerbsvorteile zu sichern, zeigen crowdsourcing-basierte Ansätze heute wie die „Intelligenz der Masse“ für bessere und erfolgreichere Produktentwicklungen genutzt werden kann. Ein frühzeitiges Integrieren von möglichen Nutzern in den Entwicklungsprozess führt damit zu einem gemeinsamen Strategieren zwischen internen und externen Stakeholdern – mit allen Schwierigkeiten, die derartige Projekte mit sich bringen. Denn Unternehmen und Kunde verfügen weder über gemeinsame „Arbeitstechniken“ noch über identische Tools zur Ideenentwicklung und i. d. R. auch über sehr unterschiedliche Anforderungen an neue Produkte.

Wie man diese Konzepte dennoch selbst bei Traditionsmarken erfolgreich umsetzen kann, zeigen Beispiele aus dem Konsumgüterbereich, in dem mithilfe von entsprechenden Crowdsourcing-Communities gezielt neue Produkte oder auch „nur“ Produktvarianten

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