

Preface

Digital is at the forefront of current changes in businesses and, in a wider context, society. It is at the core of a new industrial revolution – the third of its kind.

For an industrial revolution to arise, four key factors must converge:

- An invention or series of inventions in a particular field which give rise to these changes – a substantial amount of time may pass between the ‘discovery’ and the revolution.
- Initial distribution in traditional economic sectors. This is known as continuous or incremental innovation. Innovation is said to be ‘continuous’ if it helps improve products or corporate operating methods (processes, structure, etc.) without posing a threat to the structure of existing activities. In this scenario, the ecosystem remains relatively stable as ‘developers’ suggest new on-trend solutions to ‘users’. The innovation creates value for both the first developers (the sale of their new products and services) and second developers (process improvements and a rise in productivity). Technology allows businesses to boost their production, distribution and logistics performance.
- More rarely, a second level of distribution may occur. This leads to major upheaval with the emergence of new activities, or even new economic sectors over time. The innovation is then said to be ‘disruptive’ as a new source of economic value is created, establishing new profit sharing mechanisms between old and new players. Other industrial sectors then emerge with a substantial element of trial and error among entrepreneurs who attempt new disruption-related ventures in a bid to offer new services to both businesses and individuals. This results in a new industrial sector which develops these offers.
- The fourth key element is a feedback loop of sorts where this new sector goes on to boost the economy as a whole. A ‘virtuous’ cycle is

complete when traditional businesses and developers secure some of the value generated by a new business sector.

An industrial revolution comprises seven key stages at its core:

1. A technological discovery is made. A relatively long period of several decades may pass between the discovery itself and the marketing of industrial solutions.
2. Businesses support this new technology and market the resulting products or services to bring about improved performance in existing companies.
3. The businesses driving this innovation can develop by offering new services that continue to benefit traditional businesses. A typical cycle stops here.
4. Businesses may attempt to offer new services establishing a new activity in its own right, for both businesses and the end consumer. This exploratory phase generally ends in failure, such as bankruptcy, a stock market crash or sector consolidation.
5. When it comes to industrial revolutions, success ultimately comes to a few entrepreneurs with a two-fold impact: certain success with the general public...
6. ... alongside (and so the virtuous circle begins) success with traditional businesses which go on to benefit from this new sector (because it will either become a client in their industry or an indirect competitor, thus forcing them to develop).
7. Finally, the businesses behind the initial technology also fare well as the new businesses become clients and the virtuous circle loops back with them.

Historically, modern western economies have experienced two relatively complete 'virtuous' cycles: the two industrial revolutions. The information table below explains the third industrial revolution – digital – currently underway:

Phase	Description	First industrial revolution	Second industrial revolution	Third industrial revolution
1	Technology discovery	Steam and its uses	Electricity and oil exploitation	The digitisation of data and networks
2	Exploitation of this discovery by businesses for traditional sectors (improved performance)	Farming businesses (development of the farming mechanism) and the cotton industry saw substantial changes in their working methods as a result of new steam-powered operational solutions.	The flagship or beneficiary companies of the first industrial revolution were among the first to take advantage of the new contributions from these discoveries: the development of electrometallurgy and the chemical-pharmaceutical industry.	Industrial businesses and services have improved their information exchanges. Car manufacturers were among the first to adapt (for purchasing), along with major groups from the second revolution, e.g. GE.
3	The development of businesses driving the innovation	The metal and steel industry used the undeniable advantages of steam-powered applications to develop new products, especially in the raw material processing sectors (farming and cotton).	Electricity and oil companies developed a structure to supply traditional businesses and States with the energy required.	Telecom operators, network parts manufacturers, IT companies and software publishers.
4	Exploratory launch phases for new disruptive activities	The first wave of cotton mill 'startups'* emerged. Railways developed as a new form of transport. The lines (a line was a business) were once again operated by small companies. Commercial success was achieved with the general public until the stock market crash of 1848.	There were two startup phases. The first put its main focus on energy with thousands of dynamo workshops flourishing far and wide before soon fading into obscurity. However, car and aircraft manufacturers also developed. These inventor-entrepreneurs used cutting-edge material technology, and oil became the essential fuel. Concentration took place in line with stock market contractions (1907-1910).	The first wave of startups emerged in the late 1990s, especially geared towards fixed Internet. In 2000, the dot-com bubble burst. The second startup phase began in 2010 with four billion individuals now connected to the Internet. There are several fields of experience, including the Internet and mobile Internet, 3D printing, green IT and transhumanism.

5	Progress from an initial discovery leading to success in a new sector	Despite the crash, the freight transport sector was revolutionised by steam. On the one hand, boats took on a whole new dimension (size and speed) and, on the other, the rail sector achieved huge success for both freight and passenger transport. Rapid restructuring took place in both sectors.	The 3,000 car manufacturers in France in 1900 soon experienced a process of concentration which was echoed in other countries. However, passenger transport was revolutionised and two new sectors (car and air) gave rise to new activities within this industrial revolution, for both businesses and the general public.	The story is currently unfolding around the economy of platforms combining data exchange, new ecosystems, social networks, etc.
6	Additional improvements in traditional businesses	The fast, long-distance transport of substantial amounts of freight – by boat or train – improved productivity and developed logistics, making it easier to carry goods and passengers.	The car and aviation industries were the catalysts for the traditional economy: they were an important client (directly or indirectly with new infrastructure such as new roads and airports), improving exchange through faster transport and recommending new management and operational methods (Ford, Sloan, OST, Toyota, etc.).	The digital transformation is underway in traditional businesses in both commercial and structural terms, e.g. big data, digital customer relations and supply chain implications. The industrial processes have been transformed by industry 4.0.
7	Sustained success for companies driving the discovery	As railways and shipyards developed, the steel industry was stronger than ever and appeared to be the face of the revolution.	The development of the car and aviation industries had a multiplier effect for energy supply companies.	Telecom, IT and content digitisation players have seen their success soar. Fourteen of the world's top 20 global brands in 2017 had a platform-based business model.

* This word is a clear anachronism but references the situations encountered since the late 1990s.

But what is digital technology really? The answer to this question could be a whole new book. From a critical standpoint, we could say that it is one in a long line of portmanteaux. In France, 'e-business' was the buzzword in the late 1990s, followed by 'numérique'. Nowadays, 'digital' has taken centre stage. The word is in fashion. The most interesting aspect is its primary role in the fundamental transformation of businesses and organisations. Many digital-related concepts – even economic models – were put forward during the first dot-com bubble which burst in 2000. However, there is a major difference now: the number of people with

access to these services is not in the tens of millions but in the billions, across all six continents. So digital itself is not the issue but, rather, the sweeping changes brought about by the technology at the root of digital transformation.

"Digital's potential is enormous. It is changing how we conduct our business, tell our stories and engage consumers. It's a rapidly changing landscape and a big part of our future."

"If you went to bed last night as an industrial company, you're going to wake up this morning as a software and analytics company."

These quotes are not from young startuppers. The first is from Mark Palmer, Chairman and CEO of Nike Inc., and the second is from Jeff Immelt, Chairman and CEO of GE.

Digital is not a recent development but it is what we are making of it that is bringing about the current revolution. Let's take a simple example: how we watch a recorded film. In the 1980s, we had the famous analogue VHS cassette while the higher-quality digital DVD emerged in the 1990s. Nowadays, we have access to digital services, including unlimited video catalogues, mobile and multi-screen services, instant viewing, etc.

All that has happened in the past 30 years is that access to information and services has become easier. From the user's point of view, it means lower transaction costs. So, for any one individual, the digital transformation means a decrease in indirect transaction costs as a result of new technology. For a customer, it impacts ease of access, time and complexity of use. For a company, it impacts links with suppliers, prospecting effort, quality control, etc. For a government, it affects the centralisation of information and the efficiency of inter-administration exchange and information distribution to citizens.

To understand digital, we must grasp these four major criteria:

- **Access** to data is essential. It is at the heart of the telecoms and ICT revolution of the past 25 years, comprising the digitisation of all possible data, the development of communications networks to exchange this data and, finally, interoperability between technical teams to remove all obstacles to the exchange. The stand-out feature of recent years has been the major new role of mobility in exchanges.
- **Data** is a key element of the digital era. Whether the data is simple (a text message or USSD message) or complex (live spoken dialogue or a database), digital is all about how the data is used and monetised. Setting raw data aside, we must also look at what we do with this data

and how we exploit it – through a data analysis mathematical algorithm, for instance.

- The ability to manage everything *via* these **platforms** is another key element of modern-day digital technology. A USB stick may seem digital, but Dropbox file sharing is a true example.
- Finally, digital as we now understand it is the very foundation of a major **social** dimension. This is the case for social media, both private (Facebook) and professional (LinkedIn to maintain contacts and Web Teams to communicate with employees and boost productivity), and the general development of digital platforms, i.e. the option to manage a partner ecosystem (open innovation, business development, etc.).

This book is the 5th written by both NEOMA faculty and alumni. This is also the first edited in English.

With a number of contributing authors, this book compares the viewpoints of both practitioners and researchers in management science. The NEOMA Business School boasts France's fourth-largest alumni network among business schools and the NEOMA Business School faculty came third for research¹ in 2016. So this is a high-quality group of digital experts.

We are not looking to produce a 'digital for dummies' guide but, rather, an analysis of major current trends. This book has been split into four parts. The first analyses the new economic models resulting from digital. Here, we look into the platform economy, uberisation and new financial models. Part two focuses on the new experiences brought about by digital. These experiences are linked to the huge upswing in connected objects, changing uses across various terminals and the user experience itself. The third key trend will come as no surprise to the reader given the authors' background – the impact on training and education. Finally, part four analyses the links between digital and governance *via* dashboards and European market regulations.

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1. The *L'Express* and *L'Étudiant* studies in November 2016 and January 2017 for NEOMA Alumni and *L'Étudiant* in December 2016 for NEOMA Business School.