CHAIN REACTIONS

INNOVATION BRIEF 5

DIGITAL TRANSFORMATION 22.05.2020

ABOUT INNOVATION BRIEFS

CHAIN REACTIONS addresses the challenge for industrial regions to increase regional capacity to absorb new knowledge and turn it into competitiveness edge and business value. There is a strong need to help SMEs to overcome capacity shortages for innovation and integration into transnational value chains.

The project aims at empowering regional ecosystems with the knowledge and tools to help businesses overcome those barriers and generate sustained growth through value chain innovation.

CHAIN REACTIONS focuses thereby on modern approaches considering value chains and their complex developments rather than linear technology transfer approaches. The framework of value chain innovation builds on Porter's 5 forces framework (new entrants, substitutes, customers, suppliers and rivalry) and transversal innovation drivers: key enabling technologies, resource efficiency, digital transformation and service innovation.

During the project lifetime CHAIN REACTIONS will publish about every third month an INNOVATION BRIEF presenting the rationale behind specific innovation drivers and illustrate them with practical examples.

This new thematic brief of the CHAIN REACTIONS project highlights the characteristics and perspectives of digital transformation. The analysis covers definitions, references, concepts, obstacles and success factors. The results show that digital transformation is characterized by diversity in methodological perspectives but also in IT and application areas. This brief also reports on an important shift due to the current pandemic to accelerate digital transformation.

DIGITAL TRANFORMATION

A worldwide shift

The rise of new technologies like social networks is leading companies in all industries domains to explore and exploit their benefits for their own specific business. They have to adapt their key business operations and their organizational structure and even change their products and processes. They needed to set up management practices to govern these complex transformations [1].

The new digital technologies are penetrating all markets and are affecting the society as a whole. They support the globalization, stimulate worldwide competition and are putting pressure on all businesses to go digital before others do in order to survive and get competitive advantage.

The big digital players (e.g., Amazon, Facebook and Google) emerged during recent years and traditional companies are under threat [2]. These later all plan business transformations to rapidly develop and implement new digitally-based business models. But these changes are taking much longer and companies are facing more difficulties than they expected.

Successful Digital Transformation requires an organization to develop a wide-range of capabilities, which will vary in importance depending on the business context and the

individual organization's needs. Digital technology needs to become central to how the business operates, and organizations effectively need to re-think and possibly re-invent their business models in order to remain competitive [3].

Digital Transformation transforms business models, operations processes and user experience. This transformation process can lead to important business opportunities but also to technological and organizational vulnerabilities.

Definition

According to Fitzgerald et al. [4], this is the use of new digital technologies, such as social media, mobile, analytics or embedded devices, in order to enable major business improvements like enhancing customer experience, streamlining operations or creating new business models.

For McDonald and Rowsell-Jones, the Digital Transformation as such goes beyond merely digitizing resources and results in value and revenues being created from digital assets [5].

In fact, if many different definitions for digital transformation can be found in the literature, each of them focuses more or less on the following perspectives:

- Technological : focusing on the use of new technologies.
- Organizational : focusing on the change of organizational processes or the creation of new business models.
- Social : covering all aspects of human life and of the society.

As a whole, one can consider digital transformation as the use of new digital technologies that enables major business improvements and influences all aspects of customers' life.

The diversity of business transformation

Digital transformation is not unique. Digital transformation is a large process with multiple connected intermediary goals. In the end, this overall process is striving towards continuous optimization across business processes, units and the business ecosystem of a company. It is building the bridges between front end and back office, data from 'things' and decisions, people, teams, technologies, various players in ecosystems etc.

Digital transformation covers a huge number of processes, interactions, transactions, technological evolution, changes, internal and external factors, industries and stakeholders.

When considering advices, reports and predictions on digital transformation, it's essential to keep in mind that digital transformation is a very broad and multiform concept. Although common challenges and goals can be identified in organizations across the globe, there are also major differences per industry, region and organization (e.g. taking in account regulatory environments).

Digital transformation can affect the following aspects that are connected or even overlap (this list is not exhaustive.):

- Business units and functions: marketing, manufacturing, human resources, administration, sales, after-sales, etc.
- Business processes: Business process optimization is an essential issue in digital transformation strategies.

- Business models: digital transformation is often affecting the businesses work, from the value proposition to the ways to make money. It may change revenue sources and approaches and even drop the traditional core business after a while.
- Business ecosystems: the networks of partners and stakeholders must be considered, as well as overall business context (e.g. regulatory priorities). New ecosystems and partnership models can then emerge based on companies with various background during the digital transformation implementation. Ecosystems will be an important key in achieving digital transformation success.
- Business asset management: traditional assets are usually taken into account but also fewer tangible assets such as customer information.
- Organizational culture: digital transformation often leads to acquiring core competencies at management board in areas such as digital maturity and leadership
- Human management: Digital transformation even puts people and strategy before technology. Changing behavior, expectations and needs of customer, worker and partner are crucial. As with any IT-enabled change, it is not enough to bring the IT to the organization; To accomplish change management, people must be trained in a change process that takes into account the unique challenges presented by IT [6]. New communications skills and new knowledge are usually needed.

Two other issues became increasingly important during the very last years: IT security and personal data protection. Both needs to be carefully into account while implementing digital transformation strategies.

From a technological point of view, digital transformation is often dealing with the implementation of platforms in the following technological areas:

- Intelligent objects and transactions: Internet of things (IoT), RFID, blockchain...
- Data management and infrastructure: BigData, AI, Machine Learning, Cloud, Data analysis, 5G...
- User experience: ergonomic, accessibility, performance
- Simulation: Augmented Reality (AR) & Virtual Reality (VR), digital twin
- Manufacturing processes: Additive manufacturing, ...
- Interoperability: SEO, semantic web, API

The challenges and obstacle of digital transformation

The overall digital transformation of the society and economy has always had a strong connection to the industry. The “industry 4.0” that is coming as the fourth industrial revolution will amplify the digital transformation phenomena all around the world.

According to research from IDC [7], digital transformation accounts for over 40% of all IT spending and is expected to top EUR 2 trillion by the end of 2022. These digital transformations cover all types of adoption from cybersecurity to artificial intelligence and automation. This leads to higher earnings for firms and better gross margins. All digital transformations aim to

make businesses more efficient by expanding their digital capabilities and the goal of this activity is to increase revenue growth. Today's IT leaders must remain on the cutting edge if they want any hope of remaining competitive and viable in their industry.

According to the recent IDC's European Digital Transformation Strategies document [8], seven out of ten European organisations are struggling with realising their digital maturity ambitions. This study also stressed that less than three out of ten have managed to significantly digitise their business models, processes, products and services.

The global survey from Riverbed [9], which includes responses from 1,000 business decision makers at companies with $500 million or more in revenue across nine countries, identified five most significant barriers when working towards a better digital strategy:

- Budget Constraints (51%)
- Overly complex or rigid legacy IT infrastructure (45%)
- Lack of full visibility across the digital or end user experience (40%)
- Lack of available or appropriately skilled personnel (39%)
- Lack of buy-in from leadership on prioritizing digital initiatives (37%)

Lack of commitment is reported to be a very common failure point. Understanding and agreeing to the concept and vision for the digital transformation is not the same as committing to do what it takes to succeed. If leaders of a company can have understood about the need for change, they do not necessary commit to the related massive change that is needed to achieve this vision and strategic intent. An obvious market threats is not enough to galvanize the whole company around this transformation.

Need for agility

Some companies may try to move to a new business model using a waterfall planning process. Starting from a vision, they can build a business case and then work on a detailed and long-term plan to implement it. This approach is reported to be very high proportion of failures.

Deployment of agile project management models offering iterative sprint approach is considered to be the key of success.

1. if digital transformation projects will often have a clear end objective, most of them will not be clear from the beginning on how that objective will be reached, or what it will exactly look like once it has been achieved. Digital transformation processes need both control and flexibility to mitigate risk and allow responsiveness in project delivery.
2. As mentioned before, digital transformation needs strong change management processes, and employee or even partners engagement in order to really succeed.

Agile project management allows for efficient organisational control over every stage via iterative delivery. Iteration time frames are predetermined and can range from weekly or monthly deliverables. This results in better overall engagement and more relevant outcomes.

This way, no time is also wasted making intensive plans that will likely change anyway. An high level plan is enough to keep controlling overall progress while this plan is brought to life through controlled iterations. Thanks feedback loops, risk is constantly being mitigated. The project's highest priorities are implemented first. Regular iterations and feedback from all

shareholders mean that the final product is optimised for the organisation's exact needs and that the project is actually supported by people in the organisation.

Digital maturity

The digital maturity level is the actual state of a company, which describes the previous transformation of manual, analogue processes into digital processes. In addition, changed working methods and business models are included as criteria for the degree of maturity and their development is evaluated.

Benefits and relevance of digital maturity

Within a digital transformation project, the degree of maturity serves as an aid in the analysis phase. The following benefits can be identified:

- A mapping with regard to the digital status becomes possible.
- The further procedure can be planned according to the mapping, taking into account any optimisation potential that is discovered.
- Furthermore, the digital maturity level serves as a basis for a common understanding: opinions about what determines maturity and how mature a company already is can vary within the company.
- By taking up the important aspects of digital transformation and standardising the calculation, a common understanding of the concept of digital maturity and its influencing factors is made possible.
- By using the same model for several companies, a comparison between industries and company sizes is also possible.

Building on the analysis of different models, a CHAIN REACTIONS model has been designed with the aim to be applicable for SMEs and with a clear focus on providing input for the identification of innovation potential.

It can be used in practice in the form of an interview or a self-assessment online questionnaire and addresses six key dimensions:

Dimension 1: Strategy & Leadership
This dimension examines the topic of strategy and business motives. It is linked to the management, as the latter has the decision-making competence in the area.

Dimension 2: Corporate culture and organisation
Staff, cooperation and communication is taken up here.

Dimension 3: IT infrastructure
To support and use new processes, new business models and new technologies, a suitable IT infrastructure is necessary. Whether this is operated internally or by the service provider is not relevant in this dimension.

Dimension 4: Data maturity level
Providing more information for the changing customer and the evaluation of real-time data is dealt with and examined in this dimension.

Dimension 5: Processes and operations
Dimension 5 deals with the networking of processes, both internal and external. The use of new technologies in operations is also relevant here.

Dimension 6: Product (use phase)
The product dimension takes into account the customer and his changed behaviour. The products and their adaptation to Digital transformation are also to be located here thematically.

The structure of this maturity model, which focuses on the digital transformation, will be adapted to further innovation drivers within the next months. A similar structure along dimensions, capabilities and variables for the operationalisation of the model will be adopted.

2020: will Coronavirus force digital transformation?

The current pandemic is radically changing our habits and our consumer behavior. The coronavirus outbreak is expected to transform shopping, production as well as all business relationships.

Companies, institutions, and nonprofit organizations all around the world are learning not only to work remotely but also to change the way they do business. The services that we can use without leaving our homes is currently growing quickly.

Those citizens who are practicing self-isolation or any kind of social distancing are increasingly interested in online products and services being offered by various big companies or startups. Governments are quickly developing e-services for communicating or for the education area.

The consumption of internet data is everywhere growing rapidly.

On the one hand, the current pandemic is forcing a rapid evolution (or even transformation) of infrastructures and processes. Everything shifts online (food orders, grocery shopping, business meetings, learning, entertainment etc.).

On the other hand, the global uncertainty on the financial markets and the loss of jobs is causing many firms to rethink their investment that they might have planned on technology and infrastructure upgrades and strategic digital transformation.

Literature

1. Matt, C., Hess, T., Benlian, A.: Digital transformation strategies. Bus. Inf. Syst. Eng. 57(5),339–343 (2015)

2. Sebastian, I., Ross, J., Beath, C., Mocker, M., Moloney, K., Fonstad, N.: How Big OldCompanies Navigate Digital Transformation. MIS Quarterly Executive (2017)

3. Carcary, M., Doherty, E., Conway, G.: A dynamic capability approach to digitaltransformation–a focus on key foundational themes. In: 10thEuropean Conference onInformation Systems Management. Academic Conferences and publishing limited, pp. 20–28 (2016)

4. Fitzgerald, M., Kruschwitz, N., Bonnet, D., Welch, M.: Embracing Digital Technology: A New Strategic Imperative. MIT Sloan Management Review, Research Report (2013)

5. McDonald, M., Rowsell-Jones, A.: The Digital Edge: Exploiting Information & Technology for Business Advantage. Gartner Inc. (2012)

6. Benjamin, R., Levinson, E.: A framework for managing IT-enabled change. Sloan Manag.Rev. 34(4), 23–33 (1993)

7. Worldwide Digital Transformation Spending Guide - https://www.idc.com/getdoc.jsp?containerId=prUS44440318

8. IDC Manufacturing Insights: European Manufacturing Digital Transformation Strategies

9. Riverbed Digital Performance Global Survey 2018 , Research was completed in May 2018 across nine countries: US, Australia, Brazil, China, France, Germany, India, Singapore, and the UK