Digital technology requires other design routines[1]

Social design questions must precede technical design questions

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Digital transformation is in the spotlights. But what is it really about? In order to find a joint optimization between technology and people working in collaboration, organizations and professionals have to learn to design differently. This requires new, agile and socio-technical driven, routines. For organizations and professionals who stick to the current, bureaucratic driven, routines we predict an accelerated and painful end.

Introduction
Digital transformation seems constantly to be in the spotlights nowadays; it is the IT world's new buzzword. Large consultancy firms produce concepts, models and unsolicited advice via white papers in seemingly endless ways. The message is that organizations are at the edge of missing the boat if they go on board too late. Is it really that urgent? How often in recent years haven't we heard such claims without changes actually happening. Now, however, it is different: the emerging of the fourth industrial revolution. Technological developments, like data analytics, artificial intelligence and internet of-things, are affecting - positive and negative - existing social relations in a political, cultural and economic sense.

Minorities make their voices heard through social media, and by doing so influencing public opinion. Children become addicted to their smartphones and alienated from physical reality. Mothers set up web shops and compete with large companies. It is, therefore, not a matter of digital technology but of the social impact of applying and using digital technology. These changes have consciously to be designed in order for their effects to be or to become positive. In this contribution we will zoom in on this; we will limit ourselves to the consequences in and for organizations. We show how this can be dealt with from an agile, socio-technical perspective.

Digital Transformation Phases
Digital transformation integrates digital technologies into all aspects of society. As a result, relationships and interactions between actors change fundamentally. Despite the fact that digital transformation is referred to as the fourth industrial revolution, this revolution goes through roughly three digital evolutionary phases (see figure):

- *Digitization* is the first phase. It concerns the conversion of analogue carriers of data (paper) to digital carriers (databases). This phase began in the 1960s and is still in full swing.

- *Digitalization* is the second phase. It concerns the adaptation of digital technology in business processes. The massive introduction of transaction and management information systems, such as enterprise systems (ERP), at the end of the 1980s marked this phase. This phase is still in full swing.

- *Transformation* is the third stage. It concerns the creation of new business models based on the possibilities of digital technology by which processes can be integrated from A to Z. This third phase fundamentally changes the way in which organizations

[1] Translation of an upcoming, slightly modified, article in 'De Automatiseringsgids' – August 2018.

operate and how organizations realize value for customers. It also implies that the way they think about organizing and managing has to change and that they must learn to look more holistically.

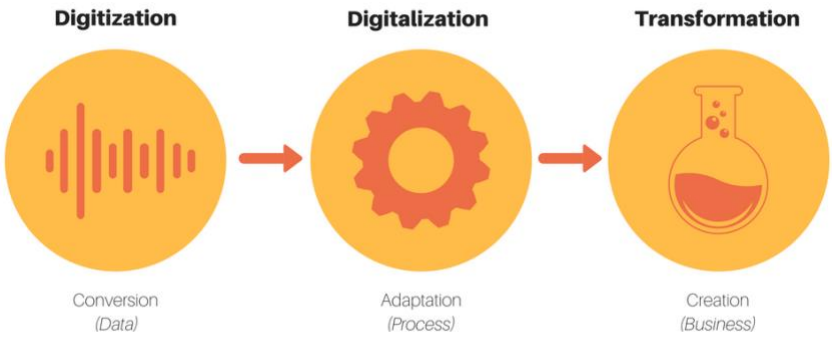

Figure: Phases of Digital Transformation[2]

Disruptive effects

The digital transformation is unfolding at a fast pace. This offers new, unprecedented opportunities to market new business models and related products and services. Threats are, also, lurking because it can overthrow existing business models and related products and services. So-called disruptive effects of digital technology. Inspired by Sombert (1863-1941), the economist Schumpeter (1883-1950) talked in the 1930s about the process of creative destruction: successful applications of new technology, for example, destroy old professions and at the same time create new ones. On three aspects, digital technologies – like data analytics, artificial intelligence and internet of-things - bring about disruptive effects.

First of all, we refer to "customer experience". Customers become an essential part of the (primary) process. They carry out parts of that process themselves and find it self-evident and service-oriented. Internet banking is an example. Since customers, for instance, enter their own payments themselves, the bank has fewer administrative tasks to perform. It is important that the customer does not experience this as a burden but as a plus. This is why banks are making their digital infrastructure more user-friendly and extending it to different platforms: mobile in addition to computers.

Secondly, we refer to 'operational agility'. Work processes, especially with regard to services, are increasingly taking place within digital platforms. Processes are put together by bringing together basic 'Lego blocks', so that new business models can be put on the market quickly. Setting up different web shops for specific target groups, in which the same warehouses are used at the back (back office), is an example.

Thirdly, we refer to "workforce engagement". Employees are given more decision-making powers. This is possible because digital technologies can offer more useful and accessible analyses of situations to employees in the work processes. An employee of a service desk can immediately see what type of customer is on the line as the customer profile is

[2] Taken from: Maltaverne, B. (2017). *Digital transformation of Procurement: a good abuse of language?* May 25, 2017. https://medium.com/procurement-tidbits/digital-transformation-of-procurement-a-good-language-abuse-bfcf565b957c Retrieved: on July 30, 2018.

immediately visible. The employee can better estimate what to do based on the customer's historical data and on the product's historical data. It empowers employees, which has a positive effect on work experience and involvement.

Designing differently

It sounds paradoxical: in order for digital technology to land effectively in organizations, the technical design question must be preceded by the social design question. For example:

- What new interaction possibilities does digital technology offer for a different collaboration between customer-organization, employees and management staff?
- What does it imply for quality of the organization (efficiency, quality, flexibility, innovation and sustainability)?
- What does it imply for quality of working life (challenging and active work for people)?

After the answers to these questions have been formulated strategically, the technical design questions are on the agenda, for example:

- With which digital technology can the desired different collaboration in organizations and processes be efficiently realized?
- Which conditions are needed for this?
- What is the change plan?

In addition to the sequencing of two design questions, we recommend abandoning five dominant bureaucratically driven routines and instead embracing five agile, socio-technically driven routines (see box). On the one hand, this is necessary because organizations are confronted with increasing variety and dynamics. This requires routines that encourage rather than hinder the speed of action. On the other hand, it is necessary to find and continue to find a maximum 'joint optimization' between digital technology and people working in collaboration.

The five new to be learned routines are independent of digital technology. They are, however, decisive for effectively landing digital technology with a positive transformative effect on organizations and people. For organizations and professionals who stick to the current routines we predict an accelerated and painful end.

BOX: current and new routines

The transition to and from the next five routines is crucial for the effects of digital technology to land positively in organizations and for people in organizations:

First of all, thinking about letting functional organization go of process- and chain-focused thinking. Based on the requirements and wishes of customers or customer families, processes are organized in organizational forms made up of relatively independent units that are able to respond quickly to customer demands and innovate quickly. The starting point for the design is the intended strategy of the organization. The primary process and/or primary chains between organizations form the starting point for the design.

Second, to let go of one-fits-all for one-fits-one designs. Today's digital technology offers plenty options to design and implement various, customized solutions. This possibility is still being sought too little because we still think and act too much from the experience of complex and expensive implementation and management costs from, for example, the ERP era.

Third, release the expert, top-down and cascade design approach for a participatory, bottom-up and scrum design approach. The dynamics in the environment are so high that the classical approach no longer works: too expensive and too time-consuming. Instead of elite clubs of (often technical) experts who design a complex IT system with associated working methods top-down, users will design, test and commission organizational and digital processes together with IT and organization experts in short sprints. In essence, this becomes a continuous design process.

Fourthly, letting go of the 'do more of the same' approach for a 'do different' approach. In a continuous design process, which has already been mentioned, it is also important to break away from the 'best practice' myth. These practices have their value above all for the past and present; they offer no inspiration for designing the processes and organizational forms of tomorrow. Creativity, out-of-the-box thinking and design thinking are new competencies that are just as important as technical and business knowledge and insights.

Fifthly, to let go of the consolidation of the current structures, processes and working methods for an ambidextrous approach to perpetuating and exploring. The organization is increasingly in the status of continuous redesign. On the one hand, it operates in a perpetuation mode of efficiently and effectively delivering the current services and products. The current processes and forms of organization are organized and managed for this purpose. On the other hand, the organization shall ensure that an exploration mode for the creation of new working methods, processes and organizational forms remains possible. The development of new services and products would otherwise be undermined by the current organizational and management principles. In short, organization’s and professionals must learn to think and act simultaneously in a perpetuation mode (the exploitation of the present) and an exploration mode (the creation of the new).