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7 User-Centred Change

New Perspectives on Technology Development and Implementation

*Annabel Zettl, Angelika Trübswetter,
Antonia Meißner, Mathias Jenny
and Sebastian Glende*

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7.1 INTRODUCTION

Digitalization changes our lives. How we shop, how we listen to music, how we work, how we govern. Digitalization changes our lives—on the social, economic and political level. In 2013, the study “The Future of Employment” by Frey and Osborne from Oxford University provoked excitement. Almost one in two Americans works in a profession that is likely to be automated within the next 20 years. These numbers led to numerous discussions and debates worldwide. Will robots and algorithms take away our work? Will we continue to push humans further and further out of the center of value creation?

In 2021, this debate has become much clearer. Technical potentials are one thing, but what is or can be implemented is another. In this context, Frey and Osborne (2013) speak of “computerisation bottlenecks” (p. 31); perception and manipulation,

creative intelligence and social intelligence, all qualities that are (still) more attributed to people and workers. Above all, the replacement of individual routine activities by machines has always been a consequence of technical innovations. We would like to recall the beginning of industrialization in the UK, when the weavers were afraid of competition from the automatic loom. Today, taxi drivers and bus drivers fear the self-driving car, retailers fear the self-payers and workers in assembly see their workplace threatened by robots. It remains to be seen how the future will develop exactly, but what is certain is that these technological changes can only succeed in the long run, if they are accepted by the affected workforce. “User-Centred Change” (UCC) as a participative framework for the development and implementation of technology in a work environment can help to achieve this.

7.2 DIGITALIZATION: A CHANGE PROCESS

As digitalization proceeds, working environments and demands placed on employees shift: new means of working, communicating and collaborating are possible and necessary. Work and private lives of employees are linked much more closely in many industries than in the previous decades. New competencies are expected of employees as well as of managers. At the same time, digitalization affects the balance of power in organizations, as employees are not only enabled, but in many cases also obliged to take over more responsibility than they were used to (Schwarz Müller et al., 2018). One central challenge is the speed at which these changes take place: while technological progress develops exponentially, human beings only adapt linearly to these changes. In environments in which people are required to use a new technology (i.e., the workplace), the gap between technological development and human adaptation is even larger (Friedman 2017).

All this gives us a first idea of the enormous effect the digitalization of companies can have on their employees. It is not without reason that in the context of digitalization of organizations, experts often speak about “digital transformation” (Hess, Matt et al. 2016, p.126–127; Vey, Fandel-Meyer et al. 2017, p. 23–24), and therefore about a change process (Disselkamp und Heinemann 2018, p. 95).

As all companies and organizations are “social systems” (Pettigrew 1987, p.656), composed inter alia by employees, customers and other stakeholders (de Biasi 2018, p. 24), it is evident that we cannot expect this change to be only of technological nature and to only bring about technological challenges. Behavioral issues regarding the organization have great relevance for the change process, initiated by the implementation of technology (Lorenzi and Riley 2000, p. 116). When introducing technology in such social systems or “social contexts,” not only a technological change is provoked, but a sociotechnical transformation, which not only affects the technology but also the context of use:

Technologies are produced and used in particular social contexts, and the processes of technological change are intrinsically social. ... [T]echnological change is always part of a sociotechnical transformation—technology and social arrangements are co-produced in the same process.

(Russel and Williams 2002, S.45)

In such social systems, change processes can trigger emotional reactions. If these reactions are not addressed properly, they can lead to the rejection of the change by the people affected (de Biasi 2018, p. 24).

Therefore, the social and organizational components of technological transformation have to be considered to ensure its success (ibid., p. 25).

7.3 CHANGE PROCESSES AND THE HUMAN FACTOR

The importance of those “soft factors” (Maucher et al., 2002), “behavioural” (Lorenzi and Riley 2000) or “emotional” (Disselkamp and Heinemann 2018, p.97) aspects proves true, when looking for an overview of common causes for the failure of change processes.

A literature review of de Biasi (2018, S.4) reveals: an average of 70–90% of change processes in organizations fail because of the employees’ resistance, because they are not ready for the change yet or do not feel obliged to it. De Biasi traces the failure of organizational change back to social reasons, a major one being the inability to gain the employees’ trust. This lack of trust often lies in the history of the companies and their previous handling of the implementation of change. The more change processes have failed in the past, the more resistance to further change is to be expected. For employees to be able to engage in organizational change, they have to endure an uncertain future and possible unexpected consequences. Employees who do not trust their company will not go along with such uncertainty (ibid.).

Van Dijk and van Dick (2009) highlight that most people affected by change do not resist change in general but rather fear the consequences of change, “such as loss of status, loss of pay, or loss of comfort” (p. 5). But not only do people fear personal loss, the apprehension that the change will not benefit or even threaten the organization can also motivate resistance to change. This might originate from the fact that in most cases those planning the change are not the ones who are affected by it and that both groups have very different perspectives on the organizational change. Alas (2015) also assumes that most people do not reject change in general but rather resent the attempt of “being changed” (p. 155). Therefore, resistance to change processes can be an indicator of employees feeling pushed into passivity.

According to a Capgemini study (Schaefer et al., 2017), lack of communication and silo thinking are the biggest obstacles to digital cultural change in organizations. In his textbook *Organization*, Vahs (2003) names communication, in addition to personal reservations, as one of the two main reasons for the resistance against changes in enterprises.

Despite all these findings, the implementation of new technological solutions in organizations is still often technology-driven—at the expense of social aspects. This technological focus frequently leads to problems of acceptance or in extreme cases to resistance and the failure of the whole project (Lorenzi and Riley 2000).

Therefore, the employees’ acceptance of the change process is a fundamental condition for its success.

7.4 ACCEPTANCE AS A MULTIFACETED PHENOMENON

Acceptance is a widely worded concept whose exact definition is often insufficiently addressed or presented within the discussion about technology implementation. A practical example illustrates the different facets of acceptance: an app maker wants his or her app to be accepted by the target audience, e.g., downloaded as often as possible and also used. In the best case, the users even give a positive rating in the app store. The specific usage behavior, i.e., the download and use of the app, allows conclusions to be drawn about the users' acceptance. However, it becomes more complex when looking into the corporate world. The CEO wants employees to use and accept new technology in the workplace. The starting point is different in this example, as employees are not free to decide whether to use the technology or not. There is a certain compulsion to use the technology, provided that employees care about their job. This situation can be classified as a so-called non-voluntary context of use (Huijts et al., 2012). In the context of work, it is therefore difficult to examine or assess acceptance only through usage behavior. Therefore, it is necessary to look at the employees' attitudes in order to make statements about their acceptance. The usage behavior alone is not sufficient (Brown et al., 2002).

In many studies, acceptance, as a psychological construct, is defined as the result of a process of perception, assessment and decision with three influencing variables: (1) subject (e.g., an employee) which accepts an (2) object (e.g., a digital documentation tool) within a given (3) context (e.g., a company) (e.g., Schäfer and Keppler, 2013) (Figure 7.1).

Technology acceptance is influenced by subject-related factors, such as individual attitudes, norms and values, sociodemographic factors or experiences. Moreover, acceptance is affected by object-related factors, such as costs and benefits, risks, usability, task adequacy and aesthetics. Finally, context-related factors, such as the task at hand, predominant social processes and the organizational environment as well as the macrosocial context might influence acceptance (ibid.).

According to this concept, acceptance depends on the *interplay* of these three dimensions. The object has to be "acceptable" in order to "achieve" acceptance, but acceptability is not the only condition for user acceptance. Only through the (positive) interplay of subject, object and context, acceptance can arise (Sauer et al., 2005). The three components interact and influence each other. The result of the process depends on their relationship (Schäfer and Keppler 2013, S.23).

7.5 USER-CENTRED CHANGE

To facilitate acceptance of technological solutions at the workplace, a one-sided focus on the design of the technology, on the object-related factors, is insufficient. This approach can lead to misinterpretations of the reasons for resistance, expecting it to be caused by a misfit of the system and therefore ignoring possible individual

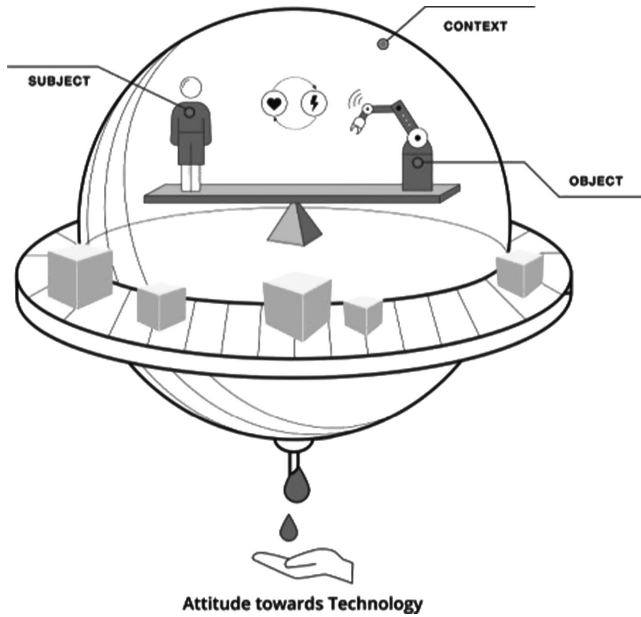


FIGURE 7.1 Qualitative acceptance model. YOUSE GmbH, based on Schäfer and Keppler (2013).

or organizational factors. The success of a certain system depends not only on technological but also on (inter)personal aspects, which are not always associated with the system use.

The standard ISO 9241-210 “Human-centred design for interactive systems” defines a process for the human-centred design of usable and useful interactive systems, the so-called Human- or User-Centred Design (UCD) process. Although this process puts the human at the center of the design process and acknowledges the context of use as a relevant design factor, the process focuses primarily on the system design, not on the system implementation. Furthermore, the approach aims at “understanding” the use of context (*ibid.* p. 16–17) but requirements derived from this analysis are supposed to be solved through the design of the object, not through the design of the implementation process or the implementation context. The User-Centred Change (UCC) approach presented here is thought to fill this gap by expanding the design focus by subject and context factors. Combining UCD with participative change management expertise allows the user-friendly design of new technologies while simultaneously designing the transformation process in the best interest of all involved actors. The decisive factor is not the acceptance of the particular technology but rather the acceptance of the change process. Therefore, change processes must be suited to human needs.

UCC is based on the conviction that bottom-up communication and participation can help employees to understand the need for change, diminish their fears and build trust in the change project. It is expected that a participatory approach allows harnessing the know-how of those affected and that employees who are involved or feel involved in the process will more often take over responsibility for these changes. Hence, participatory measures play an important role in the change process and represent a central success factor for organizational change and the implementation of new concepts (Will 2015, p. 146).

7.6 THE FOUR PHASES OF USER-CENTRED CHANGE

Instead of a sole top-down approach, UCC focuses on a bottom-up, iterative approach, which enables affected actors to become participants in the change process and which allows considering their needs and fears and helping them to build or maintain trust into the organization and the change at hand. Quick evaluation cycles ensure a reflective change process and prompt readjustment as a reaction to changed requirements or unexpected events. UCC is a human-centred and participative approach which fosters the acceptance of technology and the change process. Inspired by the UCD process, UCC consists of four phases: (1) insight, (2) path making, (3) evaluation and (4) realization, which will be presented in the following sections (Figure 7.2).

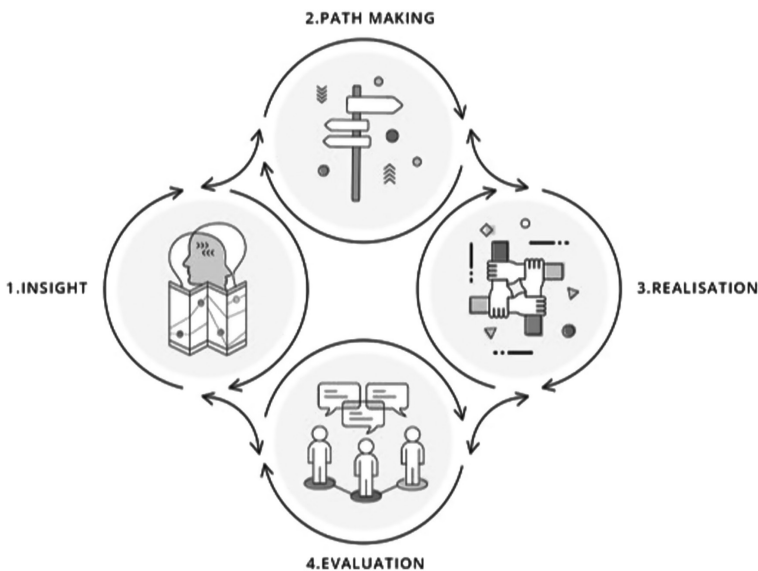


FIGURE 7.2 The User-Centred Change process. YOUSE GmbH.

7.6.1 INSIGHT

The aim of the first phase is a comprehensive analysis of the status quo, both on object and on subject and contextual levels. At the object-related level, for example, it is important to check the applicability of potential technical applications. On subject level, respectively contextual level, it is about mapping the attitudes of those involved, disclosing potential conflicts in the company. This creates a realistic, current picture of the organization, which is an important basis for the design of the change process, as the existing conditions, on the basis of which a technical restructuring takes place, have a substantial impact on the success of the restructuring. Incorrect basic hypotheses and assumptions regarding the technology to be implemented, but also regarding the attitudes of those involved, can impede the implementation and change process and should therefore be checked at an early stage. The focus in this phase is on the corporate culture and the relationship between all actors involved. UCC extends the technologically focused UCD approach to understand the way in which individual actors will be affected by the technical change and over and above all, how threatened they feel by it and why. The methodology here is based on traditional methods from UCD, empirical social research as well as design.

7.6.2 PATH MAKING

The second phase aims at a shared understanding of the restructuring as well as a common vision for its design. If employees do not understand the context and goals of a change, the process is likely to come to a standstill. In setting the course, concrete topics, goals and KPIs of the transformation should be identified and defined across teams and hierarchies. In addition to the development of the technological concept at the object level, it is important to design a roadmap for the participation of the actors at the subject and context levels. That means identifying the individually appropriate path for the transformation activities. This roadmap also includes suitable concepts and formats for qualifying employees. The roadmap design takes place in participatory workshops with the help of co-creation and/or design-thinking methods with the inclusion of different hierarchy and status groups. This approach allows getting everyone involved and jointly defining measures for the implementation and change process. Through the participatory roadmap, the change process is systematically structured and made transparent. This approach minimizes feelings of uncertainty and helplessness from the start, which often lead to resistance. Instead, the perceived control over the process is strengthened, laying the foundation for its acceptance.

7.6.3 REALIZATION

In the third step, the restructuring is designed and carried out. The technology is integrated into the existing work processes. For this purpose, the roadmap planned within the path making is implemented to support the change process. The continued existence of participatory elements plays a crucial role here: they ensure that the

technology implementation is carried out closely to the requirements of the workplace and the needs of the employees. During the implementation, early practical experience coupled with training measures is of great importance in order to build trust in the technical system. The right communication is central here. For effective participation, there should be sensible communication channels in both top-down and bottom-up directions during the implementation.

7.6.4 EVALUATION

The aim of the fourth phase is to continuously evaluate the measures taken in order to assess the change process and its impact. Appropriate evaluation measures are necessary. At the same time, organizational processes and participatory processes must also be checked for their effectiveness and efficiency. In the technology-related evaluation, classic methods from the UCD are used to assess the suitability of use and the fit of the systems to the existing work processes. This includes, among other things, usability tests and field observations, directly involving users and thus providing information on the specific design and optimization of the technical systems. Such evaluation approaches are borrowed from software development, where they have a long history and are applied widely. In contextual evaluation, the overall organizational context is considered. Among other things, the satisfaction of those involved with the process and potential points of attack are evaluated and necessary adjustments are identified.

7.7 CONCLUSIONS

Digitalization offers great changes for organizations, but also comes with risks. The transformation processes, triggered by digitalization, have to be treated as change processes and should be accompanied by well-grounded communication measures and participatory approaches. The employees affected by the change and their needs and fears have to be put at the center of all implementation strategies. Not only the acceptance of the technology to be implemented is ought to be fostered, but also the acceptance for the change itself.

The UCC-approach, with its four iterative phases, allows designing this change proactively and employee-oriented. The approach helps to identify the requirements in regard to the change process on object-, subject- and contextual levels. It suggests the participatory design of a shared vision and implementation roadmap. This way, the affected parties gain back a feeling of control and the know-how of all involved can be harnessed for a successful implementation process. Enabling employees to discover and test the technologies to be implemented can dispel fear and can promote the development of new skillsets of the employees early on in the process. Sensitive and continuous communication can help to maintain the employees' feeling of control during the actual technical implementation. Frequent evaluation measures allow testing the effectiveness and efficiency of the change process, as well as the satisfaction of the involved parties and also allows the identification of necessary modifications in the implementation approach.

The User-Centred Change approach is constantly refined and optimized. At the moment, the authors are successfully applying the approach to the fields of industry 4.0, especially focusing on human-robot collaboration (HRC), health, elderly care and banking. Further areas of application could be public administration and retail.

This chapter aimed to give insight into the theoretical basis of UCC and to encourage UX and usability experts to not only focus on the User-Centred Design of technology, but also on the User-Centred Design of its implementation, to ensure its success.

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