Working with collaboration platforms

Work design recommendations

Marliese Weissmann / Thomas Hardwig

SOFI | Soziologisches Forschungsinstitut Göttingen an der Georg-August-Universität

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Introduction

A new type of internet-based information and communication technologies – collaborative applications for communication and cooperation – are increasingly being used in a growing number of companies. While 31% of companies used such applications in 2015, the rate rose to 48% by 2019[1]. During the course of the CoVid pandemic and the subsequently more widespread use of home office, the trend towards collaborative applications is becoming more and more pronounced. For instance, Microsoft Teams ranged on top of the lists of app stores for the duration of several weeks[2].

Collaborative applications, which we will refer to as collaboration platforms, offer a digital space accessible from all devices, where employees of the whole company as well as customers or external staff can come together and openly communicate, cooperate, and coordinate. These platforms provide a flexible system, within which applications for the organisation of information and knowledge can be combined with communication software – social media especially – and whose potential for self-organisation is high. Users can create their own profiles and groups, or rather, communities for specific projects or topics, and work together in virtual rooms, follow other users, publish content, like and tag posts of others, or integrate various applications such as web conferences or a wiki for their respective working context – all on one platform.

The range of activities concerning knowledge work these applications enable and facilitate is diverse and variable: individual or simultaneous content work on presentations or documents, the exchange of information and knowledge by wiki, coordination of tasks, calendars, video conferences, single or group chats, discussion rooms, blogs, etc. Collaboration tools can be an especially important source of support in spatially distributed teams, when persons work from home or locally with their customer, or in different locations and sites. Knowledge and communication on a project or team are pooled in a virtual space and do not have to be distributed via singular emails, which may not reach all team members and then have to be looked up individually.

On the one hand, the increasing predominance of collaboration platforms originates from the companies themselves. Above all, they aim for an improvement in collaboration or – as could be seen during the CoVid pandemic – seek to enable employees to work and collaborate in home office in the first place. On the other hand, the employees themselves drive the usage of collaborative software forward when they rely on free-of-charge web-based applications (e. g. WhatsApp, Dropbox) for their work. In many cases, they are not aware of the privacy issues this entails. This self-initiated use puts companies under pressure to offer safe solutions fulfilling the same role, while responding to the increasing demand for digital work and communication, mobile work and work-life balance. If, for example, social media such as WhatsApp are used within the company, this is of importance because of data privacy issues alone.

Owing to the collaboration platforms' versatility, their potential for improving collaboration within the company and their availability, it is tempting for a company to increasingly employ these collaboration platforms in a growing number of divisions. However, it does not suffice to merely "start" the technology and then rely on user self-organisation. The process of implementation needs to be organised and decisions on usage have to be made, the more so as there often is a variety of tools with similar functions in parallel use within one company, leaving it up to the users themselves to work out the most effective combination. Instead of improving collaboration, parallel usage of different tools can cause quite a lot of problems. Frequently, it leads to what one might refer to as "chaos" or "uncontrolled growth".

Faced with this potential for chaos caused by the large variety of tools, companies are now challenged to conduct a well-organised implementation of collaboration platforms. However, whether they maintain strict control or offer more flexibility is their own choice. Depending on the specific context of the individual company (user groups, intensity of collaboration etc.) and on the objectives, they can either prescribe the usage or create a frame for more self-regulated use. Each company has to find its own balance between defined usage and self-organisation concerning a number of work design dimensions such as autonomy, transparency or purposes of use.

Those challenges are due to the specific characteristics of the technology: Collaboration platforms rely on active user involvement. Users have to individually acquire the different methods of use, thus shaping the tool's way of usage however they see fit. Given that collaboration platforms require their users, among other things, to handle large amounts of information and to work transparently, in addition to working "anytime, anywhere", they also pose the challenge of an increasing health risks, especially pertaining to mental strain and the delimitation of work. The new tools create a higher degree of transparency, which, additionally, raises the issues of data security, privacy rights and culture of work and management. Can employees trust their companies not to use their way of applying the collaboration platforms against them? Are they free in their activities on the platforms or are they being controlled, having the impression to be left too little freedom? Studies show that in the service sector, three quarters of employees observe a lack of leeway in their usage of digital technology.

Furthermore, the question arises as to what extent these applications are actually suited to support and facilitate work. How can users coordinate the various IT tools and how should they shape the interfaces? To which extent do the individual applications support the task or cause additional work effort? Also, how can they be assessed with respect to their usability and ergonomics? As these platforms are on the most part cloud solutions or software-as-service, it is the software developer who determines the speed and range of update-related changes in usage. The companies applying the platforms have no influence whatsoever on technical modifications (e. g. new features) – on the contrary, users have to get used to coping with constant change. Process-based offers of support and opportunities for learning can promote adjustment to change. Thus, it is necessary to not simply organise the implementation of the application within the company, but also the ongoing usage – being an open-ended developmental process – has to be monitored. This leads to the question of how companies can arrange their usage of collaboration platforms.

Challenges

- **Orchestration of various applications**
- **Control**
- **Stress and health**
- **Learning**
- **Data security and privacy rights**
- **Usability and ergonomics**
- **Working culture and culture of management**
- **Speed of technological developments**

In the face of the challenges outlined here, this brochure – which is based on the CollaboTeam project[3] – aims at presenting work design recommendations for work with collaboration platforms. These recommendations are suitable for all those responsible for the implementation of collaboration platforms within their respective organisations and companies or who are confronted with

issues concerning implementation and usage. This includes IT professionals in particular as well as line managers, work and staff councils, industrial engineering staff, project managers of technology introductions or pilot projects etc.

Our work design recommendations address companies of all sizes and sectors as well as companies with or without a work council since it is not solely through a council mandated by the Works Constitution Act or staff representation rights that good work design can be ensured. Within the frame of staff participation, there is a wide range of possibilities to shape work with collaboration platforms on the basis of legally binding agreements. However, due to the fact that the legal systems differ greatly from one country to another, we will not be able to delve further into this topic.

This brochure seeks to illustrate how to shape work with collaboration platforms in such a way as to facilitate good work through human-oriented working conditions, health-preservation, protection of privacy rights and efficiency. For one, this entails a holistic work design, which takes into account the interrelations between person, organisation and technology, but also actively includes staff needs. For example, this would mean to check from the employees' perspectives as well as pertaining to working culture which technology usages it makes sense to implement. Secondly, it also involves a work design that is not only on a point-to-point basis but rather observes implementation of collaboration platforms as a steady and continuous process. Because of the complex interplay of a multitude of influencing factors, it is necessary to adapt the work design to the experiences that employees of the company have had with different technologies so far. The "non-stop" usage of technology has to be monitored continuously so that it is possible to react to the constant technical changes or the employees' requirements for adjustments.

In order to achieve these goals and support persons responsible for work organisation in the implementation and usage of collaboration platforms, we will first (1) define collaboration platforms and their features, while also illustrating the opportunities and risks their usage creates. Then, in section (2), we will provide recommendations for seven dimensions of work design that should be taken into account when working with collaboration platforms. Finally, in part (3), we will summarise the general recommendations for shaping work with collaboration platforms.

1. Special features of collaboration platforms

Collaboration platforms as a new type of internet-based application systems differ fundamentally from traditional groupware (email, company-related contact directories, calendars) or from knowledge management systems applied by companies since the 1990s. These differences, which are the reasons for the platforms' innovativeness, pertain to five main features, each associated with their own respective risks and opportunities. To which extent these features will then come into play in usage depends on the work design and the regulation of usage in the specific company and working contexts (cf. Part 2 "Dimensions of work design"):

1. **An integrated solution:** Collaboration platforms allow a flexible combination of multiple features integrating everything from social media elements, web-conferences up to wikis in one system.
2. **Open and transparent communication:** Social media elements facilitate a company-wide communication and the sharing of knowledge via wiki-systems or forums.
3. **A social network:** Users can form communities and networks on different levels within the company.
4. **Malleable use:** Users can adapt the application of tools to their own requirements and interests.
5. **Growing structures:** The working structures form and develop continuously during their usage.

1.1 An integrated solution

In the past, many applications were quite specialised so that users had to employ various products simultaneously and were constantly switching between applications. This splits up access to information and requires constant rethinking during change of the different user interfaces and forms of use. Collaboration platforms on the other hand integrate **various applications**: Applications for communication, data storage, and knowledge management come together – now particularly in connection with social media elements. At the same time, the available **features can be flexibly combined**, which means that the different applications can be chosen depending on the specific task or sector in question. Furthermore, all applications work with the same database (e. g. contacts, dates and deadlines, etc.).

The more one succeeds in pooling all central applications for one workspace on one platform, the closer one is to the ideal vision of a "digital workspace". This is the term for the goal of bringing together all necessary work tools within one digital space on one single platform.

Risks and opportunities

+ Enhanced **usability** for users present an important opportunity: An example from a company we polled shows that the change from a solitary web-conferencing to an integrated solution for web-conferencing led to a considerable reduction in telephone usage. The employees were no longer looking addresses because access to contacts was made so much easier on the platform. Instead of placing a phone call, they used video-conferencing, which allowed them to see one another.

+ The main benefit in the integration of applications on one single platform lies with the compatibility of the various features as well as the uniform usability. There is less need for interfaces and a decrease in media interruptions. Additionally, different groups within the company using the technology can be offered customised features fitted to their very own requirements (e. g. sales departments, administration, customer projects, product engineering). However, special programs for the completion of certain tasks such as development software will remain indispensable.

- One risk of collaboration platforms is the **dependence on the supplying company**. It is in general a proprietary software the quell code of which will not be disclosed and whose operating procedure is neither controllable nor easily adaptable to company-intern solutions. Therefore, the usage of a collaboration platform integrating the various applications can mean that one will have to accept poorer performance from some features in comparison to other specialised applications. Nowadays, software is usually a software-as-service or cloud service so everyone involved has to adapt to short-term, producer-initiated technical adjustments and continuous updates without the possibility to have any influence on these changes.

1.2 Open and transparent communication

Whereas traditional email communication via groupware keeps the content private or at least only accessible to its addressees, content shared on social platforms is mainly – accessible and transparent for all members of the network. This means that content can be searched for and found and is therefore usable for the wider public of the company. Hence, all activities, i. e. contributions, data exchanges, status reports or tasks remain continuously accessible in a (closed) network and are generally **transparent for all authorised users**.

Instead of sending emails concerning a process, teams can generate a written dialogue in team or project forums on the platform – backed by links, documents, audio and image files which will make the tracing of the process transparent and verifiable. Team members can manage tasks via virtual task boards, thus offering up possibilities for control.

Risks and opportunities

+ Content will no longer need to be enquired about but can instead be obtained independently. Different kinds of **content available to the in-house public** are potentially accessible for all users and the exchange of information and knowledge can thus be improved. For example, all members included in the project are kept up to date on working statuses, absences etc. All team- or project-related information is pooled in one forum and content concerning another project or team is collected in a different one.

+ Collaboration is improved. Double work on one project can be avoided by transparent working status reports and facilitation of task management can be achieved via instant messaging for instance, where messages are easily kept an eye upon during work.

+ Given that information is filed in relation to topics or groups – as opposed to email messaging – less time is spent on research. Users can prioritise the information they receive and subscribe to updates as they see fit.

+ The company can generate further potential for innovation when content becomes available across the company or on an even wider scale.

- **Stress** may increase due to the mass of openly accessible information. There is a general risk of distraction and cognitive overload. Working transparently, being constantly kept up to date and keeping up to date – particularly with regard to the perceived expectations of colleagues and superiors – can cause mental strain. There may be additional loss of efficiency when quality and quantity of information are unbalanced[4]. In order to cope with the increased transparency and the simultaneity of information, competences for selection of information have to be acquired. Employees need to self-organise, choose and subscribe to information channels and fix times at which they take note of information and current communication. To this end, collaboration platforms offer technical possibilities. For instance, users can set their own status to "do not disturb". However, it remains extremely challenging for every user to handle the integration into the many ongoing communications and the accessibility of content without becoming overwhelmed.

- Furthermore, transparent and especially informal communication may ignite social conflicts or cyberbullying on team platforms. The term "cyberbullying" refers to harassing or defamatory communication towards singular others which is then openly accessible on the platform.

- **Behaviour and performance** can be controlled thoroughly by superiors, but also by the employees themselves. Each click generates data which is then recorded and open for evaluation. Platforms offer explicit options for assessment such as statistics on the number of contributions as well as an overview of who is how intensely networking with whom and how frequently a person is being mentioned by others.

- In addition, transparency can raise issues of **data security and privacy rights.**

1.3 A social network

While traditional groupware and knowledge management systems restrict and regulate the social exchange persons can have at work, collaboration platforms focus on **social networking**: All users can potentially initiate direct contact via social media on each level of work (person, group, company) and are free to build up a network. Contrary to traditional groupware and knowledge management, which mainly encourage the exchange between persons known to each other, collaboration platforms integrate both familiar and unfamiliar persons into communication. A well-known example is the possibility to be provided with solutions by persons one does not know but who frequent the same discussion rooms and forums as oneself. It is also possible to include customers or persons/companies external to one's own company into the communication and collaboration or entrust them with a task.

Risks and opportunities

+ **Self-organised interaction** offers up a chance to shape communication according to one's own requirements. Users are able to organise almost independently and form groups which can then work together and gather information on specific topics.

+ This way, network-like forms of work are created which go beyond the organisational limitations like teams, divisions or locations. Thereby, knowledge or help can be mobilised between persons not directly known to each other. New connections can be made that offer up paths towards solutions – a large advantage for knowledge work[5].

+ Additionally, collaboration platforms strengthen **social cohesion**[6]. Even if merely informal and not related to work, communication can reinforce team spirit and social cohesion within the organisation or at least create a feeling of unity, which is important especially when most of work is done virtually from distributed sites. Social media brings a welcome distraction into everyday work and lifts up motivation.

- The central risk of self-organised exchange is the danger of **overwork**: Problems can arise related to self-organisation of tasks and prioritisation of all accessible information, among others. Too many teams might ask the same experts for help. The increase in volume of communication and information can expand the **workload** and boost spatial as well as temporal delimitation of work, which generally poses a risk in the usage of digital networking technologies. Moreover, limited possibilities for control and the tendency of delimitation facilitate violations of work time regulations.

1.4 Malleable use

Traditional business software predefines usage and users merely have to apply the technology. Collaboration platforms, however, are designed differently. In principle, the tool enables its users to decide on the way the team platform is structured – for instance, how to handle the filing of documents or team-specific wikis. Thus, the users themselves have to be more active and adopt their own individual way of use from a variety of options, adapting it to their requirements for work or team communication[7]. They have to consider which apps they want to use, whether they want to add more apps and how they want to record results. Furthermore, they have to prioritise information, choose which groups, discussions or persons they want to follow in the network, etc. The users' settings and activities shape the way certain content is pooled on the team platforms and information is transmitted (e. g. via notifications).

Risks and opportunities

+ Collaboration platforms are **open** for various purposes and modes of usage.

+ The same technology can represent different work-related requirements and concepts.

- However, the collaboration platform is not a cure-all and cannot offer up solutions for every single task and purpose. If, for example, users are included in a large number of discussions, the **performance can reach its limits**. This is especially true in occupations where there is only little cooperation. Employees can be faced with conflicting demands.

- Moreover, if employees fail to adequately acquire a productive working mode for the collaboration platform, they run the risk of **losing knowledge** by not using prior results or not systematically processing knowledge.

- Another risk is that of not completely replacing formerly used IT applications with the collaboration platform. This doubles the effort of procurement of information and thus the workload, for example because one does not only need to share information on the platform but also has to pass it on via email and other channels of communication.

1.5 Growing structures

Traditional groupware as well as knowledge management systems and their organisational structures predefine workflows, rights of decision, and information rights. Content in knowledge management is specified in advance. In contrast to these prescribed structures, collaboration platforms allow their **structures to develop "from the bottom up"**: Working structures such as the filing of content or its usage emerge from the self-organisation of principally equitable users[8] in various groups. Thus, knowledge evolves through the self-organised activities of users and is then pooled and categorized. An example for this could be wiki systems, in which activities of users lead to the formation of complex structures. The usage-based tagging of information is much more efficient and flexible than prescribed classification systems which all those involved have to be made aware of.

Risks and opportunities

+ **Self-organisation** opens up chances for user communication independent of affiliation with a certain team or division or even process responsibility. Structures are flexible and can be formed and developed further according to user requirements (e.g. working groups, wiki content, prioritisations, categorisations). Hence, the exchange of knowledge is usage-driven: Experts on a specific field and interested lay persons can organise in communities. It is there that team members may turn to for advice.

- Self-organisation entails the risk of **heterogenous usage and insufficient integration**. When there is no coordination on rules or guidelines for usage, when rules are unclear or search functions are too weak, parallel content can emerge which is then hard to comprehend. Various practices of usage can be employed on one team or project platform, which in turn can complicate collaboration or aggravate other team members. In addition, the practices of use can differ from team to team so that persons working with different teams have to constantly rethink.

- The potentials of self-organisation can be exploited only when users are ready to collaborate and share their knowledge[9]. This is tied to a certain corporate culture characterised by openness and trust and a work design relying more on autonomy and the acquisition of competences than on hierarchical control.

Overall, the five features of platforms demonstrate that contrary to conventional systems of information and communication, users of collaboration platforms can be provided with more creative freedom for work design and a wider scope of action in view of technical, functional, social, spatial and temporal dimensions. Companies who wish to take the opportunities for improvement of collaboration and the promotion of good work provided by collaboration platforms, however, have to set a frame that facilitates a productive way of usage. The more emphasis is placed on

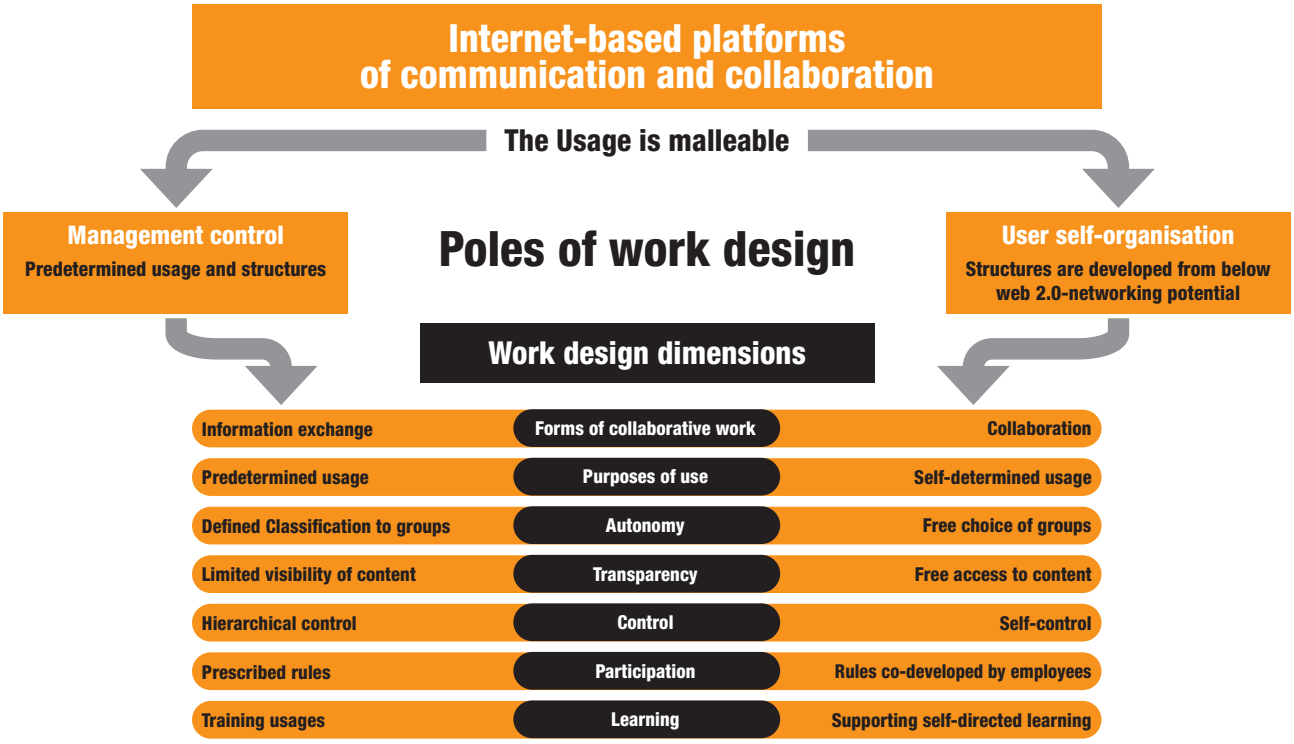
decentralised and self-directed usage, the more it is necessary to set standards for the general usage of collaboration platforms and for the interplay of its diverse elements in order to ensure a reduction in work effort and to avoid chaos and inefficiency.

Features of work with collaboration platforms

Groupware and knowledge management systems	Collaboration platforms	Opportunities	Risks
Specialised applications	Integrated solution	Usability	Dependence on one producer
Communication via private channels	Open and transparent communication	Transparency	Behaviour and performance control
Restricted communication	Social network	Free communication	Stress, delimitation
Predefined use	Malleable use	Adaptability	Inefficiency
Imposed structures	Growing structures	Self-organisation	Disintegration

2. Work design dimensions

The specific usage of collaboration platforms can be shaped in various ways. In reference to Andrew McAfee (2009), the work design can vary between two extreme poles of work design: "management control" and "user self-organisation". "Management control" on the one hand typifies forms of usage prescribed from "above" and given structures have to be adhered to in orientation to the logic of a hierarchical work design and defined processes. "Self-organisation" on the other hand represents a work design following the logic that structures evolve "from the bottom up" as they form and develop independently through users and their activities (communication, drafting or attribution of content etc).



The specific work design for work with collaboration platforms within companies is usually located between these extreme poles. The solutions concerning implementation and usage of the applications differ depending on corporate culture, work organisation, company size and particularly in relation to the objectives of technology use on the part of management. Is it the objective to initiate changes towards an enhanced self-organisation of agile forms of work within the organisation, to render knowledge work more transparent in order to break up so-called silos? Or is it rather the optimisation of defined processes and a higher efficiency of established relations for communications that are the end goal of the initiated changes?

We have identified seven central dimensions for the decisions that have to be made during the work design process with collaboration platforms. The specific manifestation between the extreme poles can therefore vary from dimension to dimension. For instance, the extent of user autonomy may be much lower than the scope of content transparency. Thus, the work design dimensions can be understood as sort of a regulator and it is possible to decide individually for each dimension which goals are to be attained, what the current situation is and whether action is required. The regulator can be adjusted accordingly, i. e. more specifications can be set or retracted in order to improve work with collaboration platforms. Presumably, the different occupational groups and

divisions within the company will have diverging requirements so that it may be that management, staff, and worker's councils disagree on the desirable work design. Therefore, regulation often takes the form of interest-driven negotiations and this fact has to be considered during the shaping of work.

2.1 Forms of collaborative work

Collaboration platforms are meant to facilitate communication and collaborative work during the execution of tasks for the company. The question arises whether the goal is simply to exchange information via network or whether the company aims for more collaborative ways of work. This means new forms of collaboration throughout the organisation such as collective knowledge production by wiki. Then, the appropriate applications have to be chosen, which includes answering the questions of which and how many tools are to be employed and how much the interests of the various occupational groups are to be considered. The decisions to make are in most cases part of a complex process of careful assessment including attentive work with the collaboration platform.

Matters of work design concerning forms of collaborative work depend on the **specific tasks** and the cooperative context of work: Phone and email may suffice for persons who mostly work by themselves and need but scarce exchange. The same goes for projects in which work packages are well-defined, created with divided responsibilities and merged at the end of the process.

Working contexts which make it necessary for employees to work in close coordination entail wholly different requirements. For highly integrated, collaborative teams especially the new network-like form of collaboration with these platforms proves to be of high value.

In addition to the specific occupational context there are further factors which influence the decision on the form of collaborative work: the company's understanding of leadership, working culture, objectives for the organisational restructuring (e. g. agility, less hierarchies). Moreover, the experiences and competences disposable for the new forms of collaboration and previous learning experiences concerning introduction and implementation of new IT technologies for work design have to be taken into account.

If the platform is envisaged for company-wide communication and networking, it has to be ensured that all employees will be able to use it.

It is important to decide which forms of collaborative work the platform is meant to facilitate and according to this decision, the best-suited tools need to be chosen.

Not only the specific occupational context is crucial for the decision on the form of collaborative work but also the understanding of leadership and working culture already present within the company.

If the platform is envisaged for company-wide communication and networking, it has to be ensured that all employees will be able to use it.

2.2 Purposes of use

Persons responsible for implementation and usage need to decide together with representatives of various user groups which applications on the collaboration platform are suitable for what intended purposes of use and which range of options the users can have to choose different applications. Furthermore, usability is a crucial issue to consider when choosing an application, especially because the various user groups might evaluate usability questions quite differently.

The usage of applications such as task management, notepad or calendar functions may be prescribed according to hierarchy or with more reliance on users' self-organisation. What impact should team members for example have on the decisions which applications they use on the platforms or how they use notepad, calendar and wiki? Additionally, the organisation has to fix specifications such as locations and forms of documentation, to what extent default forms are to be used and how detailed task management will be regulated. We recommend the creation of a company-wide or at least a sector-specific standardisation of regulations. For instance, it would be advisable for project work to trace the frame of basic documentation, which means to predefine in which structure data is to be filed and which applications are to be used for this task.

We propose that management should encourage an agreement process on purposes of use in order to clarify which specific tools are to be used for which specific purposes and which options exist. An **IT target architecture** can help to codify the agreement, covering the specifications of possible kinds of application for different tasks or if a wiki is a possible application to use.

The purposes of use should be communicated to all users and they should understand the benefits of the applications and of work with the collaboration platform in general. First-time users especially should be informed on the various possible usages via online guides or explanatory videos. They may also get support for the choice of applications (wiki, blog, library of documents, forum discussion, group formation for exchange on certain topics, chat etc.).

Furthermore, the **terms of use** and rules of conduct should be established. The latter include respectful treatment of each other, remaining objective in interaction and paying attention to the quality of the contributions. These rules are not to be neglected: Online communication and transparent work may be at the root of misunderstandings that escalate quickly. Executives reported that they paid close attention to the way they communicated with the whole team because "one sentence might work up the whole squad". Besides, it is advisable that the names of the producers of contents (postings etc.) are transparent (see below for the work design dimension of transparency).

We recommend that the company seeks an agreement with representatives of various user groups concerning purposes of use and the possible options of tools. In this agreement process, usability issues for the various user groups should be addressed specifically.

The IT target architecture can codify the purposes of use and should be communicated to all users.

We recommend a company-wide or at least sector-specific standardisation of regulations such as principal guidelines for data storage in project work.

Terms of use and rules of conduct should be established: This includes respectful treatment of each other, remaining objective in interaction and paying attention to the quality of contributions. Besides, it is advisable that the names of the producers of contents (postings etc.) are transparent.

2.3 Autonomy

The decision on what forms of collaborative work should be supported by the platform and the definition of purposes of use already concern the issue/point of user autonomy. In light of this it should be considered how much scope of action should be conceded to the users of the platform.

This concerns the creation, editing, and sharing of content or access to content and groups. Which groups, (project) teams or divisions are the employees associated with? To which extent should the employees be further allowed to freely form and join communities or groups? Should it be possible to initiate a group diagonal to sites and positions and with regard to certain working questions? Does this group have to be authorised by superiors? Will the inclusion of externals such as customers be blocked or allowed?

Roles and authorisations are to be clearly defined. Which options do group administrators and "ordinary" group members have on the platform? And who is authorised to determine whether a person can join a group – project management or team members?

If potentials for new forms of collaboration are to be exploited via networking etc., we recommend in principle to establish a high degree of autonomy for the employees using the platform. At the same time, it is advisable to come to an understanding on the degree of autonomy deemed reasonable by those involved. This is a question of finding a balance of autonomy and regulations which avoids excessively restricted autonomy while also preventing chaos and inefficiency as well as stress on employees due to insufficient regulations.

The prevention of stress also means to reflect the opportunities for self-guidance in mobile work. In order to protect employees from work-privacy conflicts, we thus commend to schedule and restrict the use of collaboration platforms to the individual working hours. This relates to a clear company-specific definition of what is recognised as working time in mobile work.

Roles and authorisations are to be clearly defined.

In principal, we recommend to establish a high degree of autonomy for the employees using the platform. At the same time, it is advisable to come to an understanding on the degree of autonomy deemed reasonable by those involved, seeking a balance of autonomy and regulations in order to avoid chaos and strain on the employees.

Concerning working hours and protection from delimitation and stress due to a high degree of self-regulation, it can be arranged that use is restricted to individual working hours.

2.4 Transparency

Concerning the work design dimension of transparency, the extreme poles go from strictly regulated and restricted content visible only to particular group members up to a maximum of transparency, meaning free access for all members of the network. Certainly, there will always be exceptions pertaining to data protection and closed domains. However, the decisions remain whether and if yes to which extent group data is to be publicly accessible for colleagues or superiors. And if yes, which data should be made public? Will a team be able to make their own decisions on data access restrictions for the team forum or is team content generally accessible for other persons on the company platform? If externals such as customers are involved in the platform, the question of access to content will be just as relevant, if only because of data protection.

Depending on the company context, we recommend to establish a mix of openly accessible groups and transparent domains in addition to closed groups. In larger companies, it may be reasonable to work mainly in closed groups where transparency of content is authorised exclusively for team members and access is only granted through clearance (by team or superiors). In smaller companies or in firms with a distinct „new work" culture, preference may lie with freely accessible, open groups.

We recommend clear **rules of transparency** – who can have access to which data under which conditions. Data security and privacy rights have to be protected, which means that work with personal data (including regulations pertaining to employees leaving the company and data storage and deletion periods) has to be organised.

Depending on the company context, we recommend to establish a mix of openly accessible groups and transparent domains in addition to closed groups.

We recommend clear rules of transparency – who can have access to which data under which conditions.

Data security and privacy rights have to be protected, which means that work with personal data, data storage and deletion periods have to be organised.

2.5 Control

How are possible transparency of content and the opportunities for free networking and collaboration to be handled? In traditionally organised companies, control and supervision are structured hierarchically. Superiors manage working processes and outcomes. However, control may be exercised indirectly via the working objectives. Thus, employees control themselves autonomously in their project/team contexts based on internalised values and the commitment to objectives previously agreed upon.

Collaboration platforms should be used for the encouragement of employee or team self-management. If the platforms are used for external control, it has to be determined beforehand which transparent data may be utilised in which manner for performance and behaviour control. For instance, may the number of one employee's entries into the wiki or in team forums be utilized for

performance evaluation? Collaboration platforms collect large and extensive amounts of working data and offer a variety of data evaluation options such as statistics on who communicates how frequently with whom in a network, who is at an important junction within the network or who seems to be in an insignificant position etc.

The **limitations of performance and behaviour control** in data evaluation of the platform need to be clearly defined and made transparent. In doing so, companies should give staff data security a high priority[10].

If data is exploited in improper ways by managers and existing agreements are thus violated, the employer should be held accountable and obliged to take back any personnel-related decisions or changes to the conditions of employment based upon the unduly used data, as well as sanction the managers involved (inadmissible evidence). This way, the employees have room to work confidently and transparently on the collaboration platform, which is a principal condition for successful use.

Furthermore, the subjective feeling of being controlled is important: Do the employees have the impression that not being constantly online on the platform is interpreted as non-work by colleagues and superiors and affects them in a negative way? In some companies, employees have concerns about this potentially negative assessment and thus work quite warily with the platform. For example, they formulate their sentences very carefully and take a critical stance towards the platform, seeing it as an instrument for control.

Fear of control alone compromises the acceptance of collaboration platforms, lowering the probability of productive usage**.** We therefore recommend that advocacy groups, or company management or HR in companies without staff participation check in staff surveys, among other things, how strongly people feel controlled. This could take place during an evaluation of work with collaboration platforms and the effects on work behaviour. One of the companies we polled, for instance, regularly conducts a staff survey which systematically assesses important company values such as transparency and trust. Based on this sort of self-reflexive survey, a discussion can take place which aims at improving those areas of work the survey has shown to be perfectible.

Collaboration platforms are meant to reinforce the possibilities for self-management of employees and teams, while additional performance and behaviour control through data collected by the platform are to be avoided.

If collaboration platforms are to be used for performance and behaviour control, the limitations of platform data evaluation have to be clearly defined and communicated accordingly.

In the case of data being exploited in improper ways by managers and utilized against agreements on personnel-related decisions or used for changes to the conditions of employment, the employers should be held accountable and commit themselves to take these decisions back and reprimand or sanction the managers involved (inadmissible evidence).

Work councils, or, in companies without work councils, management or HR, may evaluate work with collaboration platforms and its impact on working behaviour, including the issue of how employees feel controlled. Depending on the results, consequences can thus be drawn accordingly.

2.6 Participation

Staff participation is related to two aspects: First, the focus is on the design of implementation processes and usage. Overall participation would already integrate employees in an appropriate way in needs assessment of applications and platforms. Hence, those responsible for work design may gain crucial information on user needs and productive ways of usage. In addition, users and persons responsible for work design may communicate on the objectives and the purposes of collaboration platform use. The usage of collaboration platforms requires a high degree of personal initiative and an interest to improve collaboration. In accordance with user needs, a participative process can create a suitable environment for the users to learn how to be included in the design of the applications and to make themselves familiar with the technology.

Secondly, the rules and ways how to use collaboration platforms may as much as other technologies be defined either in a more hierarchically prescriptive or a more participative manner. Given that collaboration platforms offer a variety of technical opportunities of application and interests may vary from one user group to another it is advisable to have staff participate to the full. A second reason for participation is the difficulty to accurately predict the transformation of work with collaboration platforms since there are too many different occupational requirements and conditions that have an impact. An extensive involvement of employees may allow the effects of the transformation of work to be detected early on and be configured in a way as to not let it have any negative consequences. A weaker form of staff involvement is limited to the participative realisation of agreed-upon objectives, meaning particular regulations of usage developed in cooperation between staff and. Nevertheless, in this case user feedback also serves to recognise problems of implementation as they arise.

We commend that persons responsible for work design take the **visions of the various occupational groups** into account and involve these groups as well as interest representatives in all questions of usage and in project groups as early as possible, therefore letting them participate extensively already during planning and introduction phases. These phases especially are the periods when fundamental decisions are taken. The participation should concern purposes of use as well as the choice of possible tools, or in the development of the IT target architecture.

To this end, we promote the participation of employees from a range of sectors in which the collaboration platform is to be used so that the various requirements of employees meant to work more efficiently and more productively with the platform can be taken into account. Therefore, it is crucial for pilot tests that not only one single division has a say, or a division in which the staff have the most competences in the usage of digital technologies. Instead, a wider range of occupational groups or sectors within the company should be involved.

A systematic and early involvement of employees and staff representatives (if there are) allows to take into the account the various specifically work-related requirements. By this means, the quality of the solutions found and the acceptance for the agreed-upon rules can be increased.

We advise an early and extensive involvement of employees and staff representatives in all matters of collaboration platform usage in order to collectively shape the implementation of the collaboration platform. This is especially true for pilot and introduction phases. Thus, the quality of the participatively developed solutions – and therefore of work – can be increased and the agreed-upon regulations gain a higher legitimacy.

To this end, we promote the participation of employees from a range of sectors in which the collaboration platform is to be used.

2.7 Learning

Addressing the question of learning is key to working with collaboration platforms. Precisely because this technology opens up creative freedom and relies on the specific activities of its users, it needs an active familiarisation and user empowerment. On one hand, the process of learning can be assisted by a strictly structured approach: Instruction courses can teach forms of usage. This includes for example notepads, defined use cases and specific applications. In contrast, another approach of learning aims rather at self-directed learning. Users can choose from different formats of learning and assistance proposed by the company. Examples are tutorials or e-learning.

An important design recommendation is the development of skills in working with the collaboration platform, which is individually tailored to the work-related requirements of the users. The area of organisation and work, the specific occupations and team contexts determine the individual user requirements (as illustrates the example of administrative employees as opposed to developers). Moreover, competences of work with digital technologies may differ from sector to sector, including transparent work and managing the various flows of communication and information. Competences of appreciative writing, learning rules of conduct and communication are playing an important part as well. Such competences can be used to counter the health strain caused by transparency, “information overload” and work-privacy conflicts.

As collaboration platforms rely on the active acquisition of usage methods by the users according to their specific work requirements and their various backgrounds of knowledge, we recommend the creation of incentives for learning. Companies should **guide the process of learning** at the start of the implementation of the new technology. In this process, the terms of use and rules of conduct, which may be formulated more or less rigidly, should be openly and clearly communicated. This may be achieved by offering particular formats of learning and assistance from which users can get help: e. g. short instructions on certain features, forums for questions or office hours of power users who have been more thoroughly introduced to the technology and can now act as multipliers, workshops with a presentation of application cases. These formats may be adapted during the course of the implementation process. For example, a company conducted a survey on user experiences only a few weeks after the introduction of a collaboration platform. Afterwards, the project team tasked with the introduction and implementation created video clips in order to explain certain features.

We advise executives to also specifically acquire and enhance competences. New requirements for executives arise to a higher extent – particularly if potentials for self-organisation are to be exploited. Because it is then that management tasks are passed on to the team and target agreements have to be reached. In all cases, the usage of a collaboration platform challenges executives to concern themselves vigorously with infrastructure (malfunctions, evolution of the platform) and the organisation of collaboration (e. g. the manner of documentation, adherence to the rules) so that the teams can work within a given frame. Furthermore, executives need to be able to recognise conflicts early on and intervene in a de-escalating manner.

The acquisition of competences by working with the collaboration platform needs to be individually tailored to work-related requirements of its users and their respective backgrounds of knowledge.

Due to the necessity for active skills acquisition by users we recommend to create incentives to learn by introducing a variety of opportunities for learning and assistance and by guiding the employees during the learning process.

Terms of use and rules of conduct should be communicated openly and clearly.

Executives need to acquire specific competences.

3. Recommendations for an operational work design

3.1 Finding the balance between predetermined usage and self-organisation

The different work design dimensions and their respective latitudes of usage illustrate the challenge for each company to work out appropriate solutions for its own specific requirements. It is important to find a balance between predetermined usage and self-organisation, that is, finding the suitable position of the regulator for each dimension. As an example, in relation to the balance prescribed usage and self-organisation the following questions should be addressed: Is there a need for stricter rules concerning purposes of use? Where and how is work to be done? Which applications are to be used in which way in order to avoid disintegrating effects and chaos within the company? It certainly is an issue how many applications with similar functions are used in the company, for instance whether a "zoo of applications" needs more regulations and whether the applications will have to be better orchestrated.

For the respective solutions concerning the various work design dimensions it is important to take into account the differing requirements of users on whose usage of the platforms it depends whether the platform's potential for new forms of communication and collaboration can be successfully exploited. A crucial aspect of this is an objective-driven participation by employees and staff representatives. This is exemplary of the fact that shaping work with collaboration platforms is a question of negotiation processes between various actors within the company, each pursuing their own interests. According to our experience, the views on the use of the collaboration platform change in time. If user interests are taken into account, the usage is increasingly being positively assessed and persons who were critical from the start can become more open-minded. This argues in favour of adapting to an open design process in which an intensive exchange takes place between persons responsible for the work design and users in order to balance predetermined and free usage according to the specific situation and in tune with evolving user requirements.

3.2 The establishment of a professional work design

We recommend the establishment of a professional work design for the work with collaboration platforms, including a holistic consideration of the interplay of person, technology and organisation. Competences are to be specifically acquired and responsibilities have to be negotiated. Therefore we suggest structures of distributed competence, i. e. diverse network experts from the company in order to achieve the design tasks, and, if necessary, to find collaborative solutions. One example for this form of organisation are project teams for the introduction of the collaboration platform. In these teams, persons from different specialist departments shape the implementation process together. This is an advisable approach because companies are challenged to bring various specialist competences (IT, HR, quality management, specialist departments) together in order to manage the platform designs as a collective. IT on their own would be overwhelmed by this task as they are not sufficiently informed on the work-related user requirements.

In addition, long-term support is also required for work with collaboration platforms. For one, the tools are changing rapidly, whereas data backup has to be constantly seen to. Who, for instance, is responsible for storage when the project is completed? In the case of securing knowledge, let's take a wiki which is employed across teams and company-wide. In order to tend to it, "wiki-appointees" could be available to answer questions and maintain the quality, and technical staff could

provide technical support. Other possible positions could be those responsible for learning and tool-appointees responsible for certain tools, i. e. who follow technical developments and communicate them accordingly.

3.3 The path towards usage: A process-oriented work design

In view of the challenges of work with collaboration platforms such as rapid technological developments, a process-oriented work design is desirable. Companies cannot simply provide the technology and everything runs its course but it is rather a way with more or less trial and error, i. e. a search and learning process driven by joint developments, discussions of current achievements and problems encountered. Work design is moving in rather short stages, making an iterative approach of work design suitable. It is oriented towards long-term visions, but draws up solutions for short-term planning cycles, which it gradually tests and develops further on the basis of broad staff participation. In order to implement the platforms it would be advisable to launch pilot projects in certain areas of work or particular groups and to then extend the use of the platform step by step.

3.4 Trust-based collaborative culture

One condition for efficient and good work with collaboration platforms is a corporate culture based on trust. In companies, especially those with a strong hierarchical culture, employees are apprehensive of control by superiors and colleagues. The data visible on the platform could be used against them; many different evaluations are possible and the suppliers provide evaluation features. Hence, it is necessary to create a safe space for platform usage in which the employees are protected and can have confidence that they can use the platform productively for their work while also being protected in terms of privacy rights and data security. A culture of collaboration and communication based on the values of transparency, trust and openness (to the possibility that mistakes can happen) creates an important frame for the creation of such safe spaces. It is of importance for this trust-based culture that management adheres to self-imposed rules of conduct and establishes as well as maintains a specific attitude in collaboration and communication. This collaborative culture is a crucial factor in the successful exploitation of the tool's potential for new work forms within the company.

Companies working with advocacy groups can set a frame in agreements for such a trust-based collaborative culture, while also building trust by establishing clear principles of usage for work with collaboration platforms. This concerns performance and behaviour control in particular which can be ruled out in those agreements. In companies without advocacy groups the possibility still exists that companies commit to certain values, standards and practices – this may be done via charters or data policies. Apart from that, staff surveys may be conducted for the sake of regularly analysing the experiences of corporate culture and for mutual self-reflexion in order to establish a safe space for collaboration. The German labour union IG Metall proposes a mission statement similar to a charter, which is agreed upon between workers' council, union and company and has the function of a general framework for the usage of new technologies and tools. Such a mission statement identifies objectives for the usage of tools and guidelines, like a non-discriminatory and inspiring working culture as well as stimulating and varied activities[11].

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Endnotes

1 This data from the Federal Statistical Office of Germany refer to social media applications which include "all digital media (platforms) and technologies […] which enable users to exchange information with each other. Some platforms also offer the possibility to organise content by oneself or in a community" (Destatis 2017: 6; translation by the authors). This definition thus includes more than just collaboration platforms, but it can be considered as an indicator for their prevalence.

2 https://www.chip.de/news/Wegen-Corona-Diese-Apps-waren-noch-nie-so-beliebt_182554195.html; last access 22 June 2020.

3 For more information on the research project, seethe homepage: https://www.collaboteam.de/home/.

4 Cf. Papsdorf 2019: 150.

5 McAfee 2009: 83.

6 Forsgren / Byström 2018.

7 Greeven / Williams 2017.

8 McAfee 2009: 69.

9 Alberghini et al. 2013: 2.

10 In Germany, companies with work councils usually draw up agreements in which performance and behaviour control are ruled out.

11 Cf. lecture of Johannes Katzan (IG Metall Niedersachsen und Sachsen-Anhalt), https://www.collaboteam.de/fileadmin/user_upload/Praesentation_Johannes_Katzan_IGM_Workshop_2020.pdf (last access 17 July 2020).

Dr. Marliese Weissmann is senior researcher at the Soziologisches Forschungsinstitut Göttingen (SOFI) e.V. an der Georg-August-Universität [Sociological Research Institute Göttingen] and co-coordinator of the research unit “Work – Organisation – Subject”.

Dr. Thomas Hardwig is senior researcher of the Cooperation Office Universities and Trade Unions of the Georg-August-Universität Göttingen, organisational consultant for growth management (KOM.in) and visiting lecturer at the Technical University of Braunschweig.

Information on the project CollaboTeam

The project CollaboTeam addresses the questions how companies and teams especially use and work together supported by collaborative applications and how such work can be shaped in a good and effective way for employees and companies. The partner firms within this research network put the implementation of collaboration platforms to the test and approached the design of a digital work-space, developing solutions for internal collaboration and cooperation with customers. The access to the project’s outcomes (publications, contributions in conferences and transferring events) is free on the homepage of the research project (https://www.collaboteam.de/home).

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