E-Government at Work Level: Skilling or De-skilling?

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Abstract
Essential competences, i.e. abilities, skills, knowledge and motivation, are an aspect of e-government that is neglected in the scientific debate as well as in practice. The background is that manual operations are still carried out in an IT-based public administration. With regard to the work organization, the article investigates how the competences for employees have transformed at the operative level. Based on the results of case studies it becomes evident that neither a skilling nor de-skilling process is taking place, but rather a re-skilling process. This means that competence requirements at a workplace are increasing and decreasing at the same time. It becomes particularly apparent that the social skill requirements are growing as the socio-technical networking is expanding. Even though IT supports the interaction at the organizational interfaces, it cannot replace the social competence requirements and new meta competences. This presents a major limitation for implementing networked forms of organization which are enabled by IT.

1. Introduction: Neglected Work Level in Public Administration

E-government is regarded as a way to transform administration. Transformation essentially denotes a basic change of an administration's way of working [1] enabled by IT networking in particular. In practice, technical networking can be used to establish new forms of cooperation across organizational boundaries, because it enables exchanging information and re-organizing processes regardless of the geographical distance. This allows for the provision of public services to be improved considerably. One-stop government is one example: It bundles services of different public authorities in a central place using IT support to give citizens and companies better access to the administration [2], [3], [4]. However, the changes IT opens up are mainly discussed at the level of the overall organization (macro level). The operative level (micro level) has so far been neglected in the transformation debate. It is largely unclear how the activities to be performed by an individual employee and the skills they require have changed due to e-government and networking in particular. The background is that an IT-based administration still requires manual operations to be carried out and does not result in a fully automated public administration. With a view to the work organization, the following crucial question arises: How have the activity and skill requirements of the individual employees changed in networked e-government at the execution level and what consequences does this have for the implementation of new IT-based forms of organization? This question is relevant, because the e-government skills discussed in literature, too, are frequently reduced to technical aspects [5], [6], [7], [8].

The question of skills in the context of IT usage is not at all new: Already in the 1970s/80s, it was speculated whether IT rather increases or decreases skills ("skilling or de-skilling") [9], [10], [11], [12], [13]. Even though this question was asked quite mechanistically, it becomes evident that IT changes skill requirements which go beyond the ability to operate an IT application. Some authors have identified a skilling others a de-skilling process. In the meantime, it has turned out that this question must be asked less deterministically, because no direct relationship exists between IT and skills. The way of using IT in an organizational context is more important than IT itself. This perspective is essential, because this article studies the competences changed by IT at the work level which go beyond operating IT and which are accompanied by organizational changes made possible by IT. Since this topic has not been profoundly researched yet, the present article has an exploring character. Expert interviews form the empirical basis. These interviews were conducted in two selected areas in which different forms of networking were introduced as part of e-government.

The article is structured as follows: Firstly, we elaborate the basic terms and concepts: competences, work organization and networked e-government. All three concepts are presented along with their connection, and initial theses are identified which...
guide the research relating to the transformation of work competences. Subsequently, the work organization of the networked e-government is embedded theoretically. The theory serves as a further analysis and interpretation frame for the empirical procedure. Afterwards, we present the empirical findings and analyze them with regard to the changed work organization and competences. Finally, we continue to analyze and interpret the findings against the background of theoretical considerations. We draw conclusions for designing the work level and the networked administration.

2. Research Focus: Work Competences in Networked E-government

The work organization is the central research focus of the article. It concerns the individual workplace (micro perspective) and refers to the operations to be carried out by a person. Traditionally, work organization of public administration is based on the bureaucracy principles of Max Weber. A task is broken down into its individual functions so that an employee frequently repeats the smallest possible operations such as checking, registering, calculating, verifying or controlling. This yields benefits of specialization bringing this division of labor in line with the Taylor principle [14], [15], [16]. This extreme division of labor has drawbacks which frequently characterize the work level of public administration still today. These are rigid division of labor, a high level of formalization, long processing times, complicated co-signing procedures, decreased sense making and low identification with one's work [14], [17], [16].

The work organization has frequently changed against the background of IT usage, because the human-machine interface must be accounted for when designing the workplace. Humans and machines work together as a kind of tandem with IT [18] assuming such operations in which it outperforms humans. This idea dates back to the 1970s (see historical overview on research on Human Computer Interaction [19]). Only this specific analysis perspective reveals activity transformations and subsequently new skill requirements at the workplace level. Which skills are needed in a work situation also depends on the socio-technical layout of a work system consisting of humans, organization and technology. To determine the individual requirements in work situations, we must not focus on skills only, because this is a somewhat narrow concept. The skill concept refers more strongly to abilities. The competence approach in contrast broadens the perspective, because it includes skills, abilities, knowledge and motives as well as other personality traits required in a specific work situation [20]. The broad sense of the competence approach as compared to the skills approach, however, makes the study more difficult. New competences are difficult to observe directly; they can rather be derived indirectly from modified activities, which causes various survey problems [21], [22], [23]. Literature distinguishes between different types of competences, usually technical, methodical and social competences. However, a new competence discussion has emerged over the past years which is independent of the use of IT. It rather distinguishes new types of competences required due to dynamic environments. It mentions increasing self-organization and self-learning skills in the work process as well as new analytical skills [24], [25], [26], [27]. Whereas bureaucratic organizations required rather static competences limited to the execution of processes in compliance with rules, dynamic competences are increasingly gaining importance in the public sector, especially where forms of organization are increasingly networked.

There are two basic types for networked forms of organizations in the e-government context: Employees in one-stop governments handle a wide variety of tasks, because it would otherwise be impossible to provide public services from one central location. One-stop government aims to bundle and provide large volumes of information and services from many public authorities. The great variety of tasks suggests a skilling trend for one-stop government. IT can support this organization model in so far as it intensifies the integration of tasks at a workplace [28], [29]. This enables a request to be handled holistically.

Shared services are another form of networking and division of labor. This approach breaks down individual work steps and functions between different organizations for the purpose of further specialization to subsequently reconnect them via IT [30], [31]. Tasks are not integrated; rather the opposite is true: labor is divided even further and even spans across organizational boundaries. In the same way as the Taylor principle of division of labor, shared services bundle the smallest functions with a high degree of repetition to create benefits of specialization to reduce costs and increase quality. Due to the specialization, we can assume a significant decrease of competences for this form of organization at the work level, because the scope of tasks decreases due to the high level of division of labor.

This illustrates that either an increase or decrease of competences must be anticipated depending on the type of networking and division of labor. Whether and in how far this finding is true will be studied in the empirical part of this article.
3. Theorizing Work Organization in Public Administration

There is no closed theory of work organization for public administration. Rather, there are individual approaches and elements of theory in various fields and disciplines which provide clues as to the organization of labor. From a political science perspective, Lipsky developed the theory of the so-called street level bureaucrats already in the 1970s [32]. This theory, however, regards the work organization primarily from the policy viewpoint. Street level bureaucrats are persons in the operative business of public administrations who interact with citizens. They possess a high level of autonomy despite detailed process regulations and operating procedures which are referred to as discretionary scope of action [33]. On the one hand, this implicates that policy goals cannot be implemented thus immediately or that actions at the work level may contradict policy goals. On the other hand, the scope of action also enables a self-organized and efficient way of working. Subsequently, various authors added the IT component to the street level bureaucrats approach [34], [35]. Snellen, for instance, points out that IT generally limits the manipulation options and scopes of interpretation [34]. Snellen attaches special importance to the automation aspect, because routine cases in particular are assessed and evaluated automatically [34]. If a decision requires further justification, pre-defined text modules are used. Bovens and Zouridis go further in their analysis by adding the screen level bureaucrats and the system level bureaucrats to the traditional street level bureaucrats [35]. Screen level bureaucrats typically interact with citizens via the computer screen: "Public servants can no longer freely take to the streets, they are always connected to the organization by the computer" [35]. However, Bovens/Zouridis believe that the interaction with citizens can be standardized with certain limitations only. Bovens/Zouridis conclude that IT rigidly prestructures work processes and narrows the scope of action: "Many decisions are no longer made at the street level by the worker handling the case; rather, they have been programmed into the computer in the design of the software" [35]. At this point, Bovens and Zouridis see a new type of public servant, the so-called systems level bureaucrat. In the networked e-government context, the question arises how much scope of action still exists at the work level and to what extent IT limits the scope of action.

Another view can be derived from the systems theory. The new IT-based forms of organization create new interfaces where employees of the authority act as so-called boundary spanners. Boundary spanners are the link at the interface of organization and environment. They gather, process, forward and translate information into the language of the respectively other system [36], [37]. Boundary spanners therefore act in two worlds, which generally involves a great risk of overstraining and particularly high skill requirements (e.g. [38]). Consequently, boundary spanners face a dilemma between stability and flexibility and between taking in and fending off information. This causes contradictory requirements for the work actions and high competence requirements, because they must handle increased uncertainty at the interfaces. In the context of networked e-government, we must clarify whether IT absorbs or even increases uncertainties of working at interfaces.

A third perspective is that of service management: The customer as an external factor is one of the central constitutive elements to be considered when creating a service. Customers are involved in the production of the service and must make an active contribution to the service’s success. Without the interaction of the customer, the service could not come about in the first place. Therefore, we could also speak of co-production [39]. This means that not only the provider of the service is responsible for its quality, but also the customer. Interaction with the customer is thus a major component of providing the service and generally causes coordination problems. Each consumer/customer is different and consequently has different wishes and needs for the service provider. Standardizing the interaction with the customer from the service management perspective is therefore limited, at least not without quality loss. This generates a contradiction between standardization and customer orientation (e.g. [49]) which must be bridged during the interaction. Moreover, the service provider cannot predict the process, because customers often behave differently than expected. The process of service provision is thus characterized by surprises and unexpected situations. In the context of skills in one-stop governments and shared service centers, this raises the question as to what extent interaction with the customer can be facilitated by means of IT and transforms competences.

4. Empirical Findings from the Operative Level of Networked Government

The empirical study of the work organization was conducted in two different areas in Germany: for shared service centers at the federal level (Bundesverwaltungsamt – Federal Office of Administration) and for one-stop government
4.1. Initial Situation and General Conditions

Government authorities with the recruitment of staff. The Federal Ministry of the Interior, supports other federal authorities with the recruitment of staff.

The data for the cases were collected over different periods from January 2011 to September 2012 by means of semi-structured expert interviews. Questions concerned the design of the work organization in the context of IT usage and the resulting effects on the competence requirements. Each interview lasted approx. one and a half hour and was transcribed subsequently. The transcribed statements of the interviewees were assigned to the individual questions (structured summary). Subsequently, the content of each structured summary was analyzed qualitatively (individual analysis of each summary). In total, nine interviews were conducted for the D115 service centers and eleven interviews for the shared service centers. Furthermore, additional documents were evaluated such as project reports, concepts, evaluations, etc. Moreover, persons were observed in their work environment [41]. The observations focused on how activities were performed and which IT application systems were used in which way. In the D115 service centers, it was possible to monitor calls via headsets and thus directly follow the interaction between call center employees and citizens. Aspects of acting could thus be observed which would not be accessible in interviews [42]. The different methods of data collection were combined to ensure a data triangulation and thus increase the validity.

4.1. Working Competencies in One-stop Government

4.1.1. Initial Situation and General Conditions. In 2006, the federal government took up the idea of establishing a Germany-wide Single Public Service Number, SPSN. The basic idea was to create a short and easy-to-memorize phone number (115) valid throughout Germany which gives citizens access to information on all public administration services independent of responsibilities. Pilot operation of D115 started in 2009 and normal operation began in April 2011.

Telephone calls from citizens are answered by call centers in Germany under local responsibility. Citizens can call "115" to request information on 100 public services. Frequently, the information is for orientation purposes, e.g. to prepare citizens for their visit to the administration, such as opening hours, documents to be presented or eligibility criteria for a service. If employees cannot answer a question, they use the knowledge management system or forward the request to the specialist department. This distinguishes the call center from a telephone switchboard where calls are merely forwarded but no information is provided.

The D115 structure requires local administrations, Länder and the federal government to cooperate across organizations and levels. This results in different service levels (information levels) in the organizational structure (three-partite service architecture). If the first information level cannot help the caller by means of the knowledge management system (municipal D115 call center), the request is forwarded to a second information level which in turn may forward the call to a third information level.

4.1.2. Activities and Competences. We do not just observe an increase in competences for the public service hotline: On the one hand, knowledge requirements increase, because employees must have knowledge on a broad range of services. Although they use an IT-based knowledge management system for this purpose, this system addresses the comprehensive information requirements of the citizens only to some extent. Information in the knowledge management system was insufficiently prepared so that it is very difficult to adequately provide high-quality information to the caller during the phone call in case of difficult requests. The socio-technical design is insufficient here. Employees have responded by developing evasive mechanisms in everyday work, for example calling back later. This, however, also impairs the service quality due to the delayed response time. At the same time, the inadequately prepared information increases the requirements for the employees, because they must "translate" the technical language of the knowledge management system into the language of the citizen. Some employees had difficulties coping with the technical aspects in this context. On the other hand, there were also a number of routine tasks due to certain repeated requests from citizens. Approximately 80 percent of calls received are standard requests for which a simple research in the knowledge database is sufficient. Here, a trend was evident that employees were working beneath their capabilities.

It became obvious that the work in call centers requires new skills independently of the concrete knowledge requirements: the ability to multitask, an increased information processing capacity, stronger self-reflection of one's work were mentioned in particular. It was found that even though the
knowledge databases mitigated the technical requirements slightly, the requirements for non-routine cases have grown significantly. Employees permanently had to take in new information from several sources, process and forward them. Furthermore, it became apparent that the scope of action at the work level had rather increased despite intensive IT support. Employees were more challenged to organize their workflows themselves, which necessitates skills such as self-management and self-organization.

A significant change could also be observed for the social skills at the level of operation. Difficult requests in particular often require employees to cooperate with different authorities at the work level to obtain the necessary information. Employees had difficulties cooperating with other organizational units. They had to be able not only to communicate across organizational boundaries, but also to adopt a holistic approach to requests and think beyond the boundaries of their own organization.

Furthermore, call center employees are facing new requirements, because they must constantly respond to different work situations due to the high number of changing conversation partners. In particular, employees must be able to switch quickly between different topics under time pressure and to adjust to the quick sequences of new conversation partners. They also have to switch between routine situations and unexpected cases. The environmental dynamics have increased significantly for the administrative staff. Employees demonstrated a trend towards overstraining in this respect, too, in particular the older employees.

4.2. Working Competencies in the Shared Service Centre

4.2.1. Initial Situation and General Conditions

Shared service centers were introduced in Germany at the federal government level within the scope of a comprehensive modernization program in 2007. The program covers the following: "Pooling standardizable services (shared services) in a few competing service centers reduces costs, improves the service and ensures a consistent application of the law" [43]. In 2009, the shared service center was implemented in the Federal Office of Administration, a public service authority subordinated to the Federal Ministry of the Interior. For this purpose, business processes were optimized and various other technical and organizational prerequisites were created. Staff recruitment services were one of the first supportive services to be re-established as shared services. This department supports other federal government authorities, e.g. with the creation of requirement profiles to fill vacancies and planning and conducting staff selection processes. The shared service center only assumes supporting tasks here so that the decision as to the recruitment stays with the client. In 2011, the staff requirement department in the Federal Office of Administration had 37 contracting authorities as clients.

4.2.2. Activities and Competences

We can confirm a further Taylorization and specialization due to new division of labor in the direct execution of the specialist tasks. Certain de-skilling effects can be discerned here which were intensified by the automation of the online recruiting system. To mitigate the negative impact of too rigid division of labor, the shared service center introduced job rotation allowing employees to work on different tasks temporarily. Furthermore, the work-sharing and networked character of the shared service center results in competence requirements which go beyond the execution of specialist tasks. There are clear indicators that the staff recruiting department can only carry out specialist tasks in line with quality standards if they understand the entire process chain. Despite of or because of the division of labor, they must also consider the upstream and downstream process elements which are conducted outside of the authority. This requires a holistic approach of thinking across organizational boundaries at the work level to provide high-quality services. At the same time, employees felt to have a very high workload, because the contracting authorities frequently impose tight time specifications and observing these is crucial particularly in the field staff recruitment.

Advisory tasks were among the new tasks to be performed in the shared service center at the work level. In particular, employees have the task to offer staff recruiting services to contracting authorities in order to win new clients. They must exactly agree with the client which input must be provided by them, which work processes are carried out by the shared service center and for which specific (sub-)services the shared service center requires input from the contracting authority. These aspects must be coordinated with each customer.

While executing the process, further coordination activities between client and shared service center are necessary. This task is considered to be a special challenge, because process steps and sequences cannot be harmonized sufficiently. Employees in the shared service center must repeatedly ensure that certain standards are complied with at the interfaces to the contracting authorities. Even though the supportive services for staff recruitment are highly formalized, employees are largely free to organize their daily work
so that an additional scope of action exists in this regard. The employees themselves also coordinate and arrange matters with the contracting authorities. In the field of staff recruitment, too, the volume of information to be processed has grown, in particular the number of e-mails to be handled each day has increased considerably. Some employees even speak of a "flood of e-mails".

It becomes evident that the new work organization requires a high level of self-organization skills from the employees, because communication with and consultancy of the client will remain one of the main tasks despite standardization and IT support. Employees are also responsible to organize their work individually in terms of the sequence and the scheduling of their assignments. Although this gives a structure to the internal processes, cooperation and division of labor with the contracting authorities creates much scope of action for the employees and new flexibility requirements. Therefore, the execution of the work has become subject to a greater subjectivity despite the rigid interorganizational work organization and more IT support requiring increased individual responsibility along with self-control/self-reflection of the employees.

4.3. Discussion of the Results

From the perspective of the street level bureaucrats theory, we can in no case prove a restriction of the scope of action when performing tasks. For the call center, it has turned out that the knowledge management as the basis of informing citizens was poorly adjusted to the needs of the citizens. The texts were difficult to understand for the citizens so that the call center employees had to "translate" the administration language into the language of the citizens. A restriction of the scope of action was not observed in any of the cases. Even though there was a certain standardization and formalization of executing the technical tasks, the scope of action in work organization has increased. In so far, the thesis of the system level bureaucrats can be confirmed to a limited extent only for the studied cases. Rather, new competences were visible at the organizational interfaces due to the cooperation requirements.

Moreover, both cases have demonstrated that the type of IT usage has hardly contributed to mitigate the boundary spanner problem. It became evident that the uncertainty has rather increased, in particular in the call center at the interface to the citizens. This could not be compensated for by IT. Call center employees had to anticipate questions which they could not answer immediately putting them under great stress. This was aggravated by frequently changing conversation partners and situations. The same is true for the shared service center which exhibits significant uncertainties at the interface to the clients.

From the service management perspective, it became obvious that the relationship to the external factor in the call center was much less predictable than in the shared service center. The shared service center focuses on few single tasks resulting in more security at the organizational limit, although the frequency of interacting has grown significantly due to the contact with the client. However, it was impossible in all cases to predict the course of the conversation and the processes.

5. Discussion and Conclusion

In the 115 call center, the scope of tasks has increased on the whole and along with it the technical requirements. But there are also a number of routine requests. The shared service center has undergone a clear specialization process so that certain de-skilling effects have become evident as compared to the performance of tasks so far. Both cases demonstrate that there is not just a simple skilling or de-skilling process going on. Rather, employees in the shared service center showed a certain trend towards working beneath their capabilities, while the call center agents tended to be overstrained. At the same time, call center employees also worked beneath their capabilities when dealing with routine cases. It has also turned out that overstraining results from an insufficient design of the work systems. In other words, technical overstraining does not result per se from the model of the networked form of organization, but could have been mitigated by the corresponding design. Moreover, it appeared that the scopes of action for designing the work organization were not necessarily reduced despite the increased use of IT and standardization, neither in the shared service center nor in the call center. In both cases, the requirements for skills such as self-organization and self-reflection have increased.

In both cases, the networking character yielded a major transformation of competences which was, however, only made possible by IT in the first place. Increased cooperation ability is required both in the shared service center and in the call center. Both cases showed trends of overstraining of employees working at the organizational interfaces. IT could be used with limitations to reduce uncertainties and the complexity at the interfaces. This means that social skills at the organizational interfaces have grown with increasing networking and IT pervasion.

In conclusion, it becomes apparent that a re-skilling process takes place for the depicted networked forms
of organization at the work level. In fact, technical competence requirements are increasing, but paradoxically the requirements for social skills are growing along with increasing IT-enabled networking. In other words: The more networking is used to work together on an IT basis, the more social skills are required. This is the real challenge of networked e-government.

The findings of the work level of IT-based networked forms of organization provide some hints for practice. The promised efficiency and effectiveness of the networked forms of organization can only be kept if the individual workplaces are designed sufficiently. Areas of conflict become apparent at the work level in particular; these can be mitigated but not dissolved. The specific limits of networked IT-based forms of organization seem to lie at the work level. Therefore, the human factor with its competences continues to play a key role, especially in the e-government context.

6. References


