E-Government and the Transformation of Professionalism: the Case of the Police

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Abstract
In this paper we show how E-Government contributes to transform professionalism on the basis of the police work as empirical case. During the last years numerous innovations, particularly for the internal communication of the police as well as for tasks focused on predictive policing or civil security records have been implemented. These innovations coined in the term E-Policing represent a derivation of E-Government since their aim is to achieve a better service for the citizens. Moreover, E-Government tools in the context of work goals towards a more efficient organizational structure and division of tasks. In this process some tasks and with them their required competences and qualifications become obsolete. Thus professionalism and the particular discretion that the professionals should apply also change. Even if this general process is theoretically known from work in the private sector, evidence about the effects of E-Government implementation on professionalism is still missing.

1. Introduction
We aim in this paper to bring some light to this unknown process borrowing some theoretical insights from research in the private sector as well as in some public organizations. We depart from theories on professionalism and particularly on IT (information and communication technologies) and professionalism [1], [6], [59] and build up our research hypothesis on existing analysis of the effects of technologies in police work. Our empirical case study focuses on the introduction of the interactive patrol car in the police work in Brandenburg (Germany) and applies a qualitative methodology based on interviews, document analysis and work observations in order to explore this still very unknown research field.

Our research results reveal that police officers experience a transformation of professionalism manifested in the expansion of their competences, discretion and jurisdictional boundaries which they have to renegotiate in each case they are confronted to. Moreover, the increasing amount of information and visual data that police officers have to handle confront them with questions of data security and with filtering issues about their relevance for their professional goals.

In sum, even if professionalism is transforming in day-to-day work due to the implementation of E-Government, the legitimate basis for work: the qualification and with it the continuous training of elder police officers without IT habits, is still changing very slowly.

The paper is organized in five parts. Firstly we situate the concept of E-Government in the context of police work to further theorize in the second part the relationship between E-Government and professionalism in the police work and to concretize and operationalize our research questions. In the third part we explain our methodological approach and the concrete case study and in the fourth part we present our analysis results. In the last fifth part we critically discuss the application of our results for the further analysis of E-Government and the transformation of professionalism in public administration as a crucial emerging issue in the public administration discipline.

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1 In this contribution we use E-Government and not E-Governance. This is because why in our understanding E-Government means the application and use of IT at the working level of the police organization. In contrast E-Governance relates more to the context and conditions in which E-Government takes place. Therefore E-Governance focuses in our understanding rather on the political level, not on the administrative level.
2. E-Government tools and the Police Work

Police work is socially characterized in relation to the state monopoly of using force to prevent violence whereas from a practice point of view police officers claim for professionalism in their day-to-day work implementation. Professionalism grounds on a particular recognized training and academic education as well as on a specific professional ethic code [31], physical and mental health and competences [4]. However, a wide professionalization of police work is still not established. The heterogeneity of the routines and the structure of the police's work organization hinder a wide establishment of professionalization of police work.

At the same time the self-image of the police as organization relates to an androcentric culture of homogeneity that competes with an alternative emerging diversity policy even if this policy has few chances of replacing the dominant homogeneity culture due to its inherent indispen

3. Commercialization of civil security

Particularly in the 1990s the police began to identify itself as a service agency. The public is understood as client and the police tasks are increasingly defined in economic terms. Moreover, the introduction of IT contributes to a transformation at the organization and management levels towards new administration control and flexible work models. Most of all, elder police officers face problems to adapt to these transformations requiring computing knowledge to manage complexity [4]. From an historical point of view, technologies have always changed police work. Particular important innovation moments came for example through the use of automobiles, the telecommunication with police radio and the computer based work of dispatchers [42], [57].

The main idea related to the introduction of electronic tools for the police work is to enhance the work efficiency and efficacy. This means to achieve a better coordination of the limited resources (individual and organizational), a better informed police, a better service for the citizens, a faster and better crime solving leading together to improve civil security [42], [47], [38], [13], [51], [62]. Chan points out that electronic tools and particularly IT might help to cover the external actors' growing demand for information [13].

The use of electronic tools in the police work is known as "E Policing" as a derivation from E-Government in the particular context of the police. The LAPD (Los Angeles Police Department) comments about the term: „E-Policing is our way of bringing community policing to the Internet“ [39]. The Royal Canadian Mounted Police understands E-Policing as „(...) the transaction of services and information between the police and citizens via the Internet.” [40]. Povey takes another view at the concept and defines it as decentralized and mobile provision of information for the police through mobile devices [55]. Summing up, E-Policing or E-Government in the police work refers to a very diverse transformation of tasks and communication with many different consequences for all involved actors. From a more concrete perspective, Teverton et al. analyze the influence of IT in the context of E-Policing. They consider four different influence categories [65]:

1. Data collection and analysis: technologies such as smart cameras, GPS or drones enhance the volume of information and change the form of data collection as well as its analysis.

2. Problem solving: the processing and tailoring of huge volumes of data require technologies and methods such as intelligent searching, pattern recognition or data mining. Moreover, methods of data visualization are required for crime mapping.
Predictive policing, i.e. using analysis techniques for criminal prosecution before the criminal act is committed, also belongs to this second influence category.

3. Partnerships and co-operations: IT and particularly the internet allow a faster and more open communication between actors. This implies the possibility to integrate private organizations and citizens as more active communication partners. Particularly the involvement of citizens in the police work has been improved for example through social media. This form of participation is named community policing.

4. Organization structures: the use of the technologies mentioned above also means a transformation of tasks and work requirements in the police. New skills and competences are required and new professional profiles emerge such as social-media analysts. Moreover, internal processes and communication as well as operative actions change with the use of IT. Hierarchical structures are more and more replaced by flat organizational arrangements.

Related to this transformation of organization structures is an orientation towards more efficient work. Chan et al. show with their research about the police work of the Australian Queensland Police that the use of IT allows a more effective and efficient tasks implementation [14]. This is for example the case for reporting, personal and data information checking, comparison of databases or overviews on running reports.

Moreover, the possibility of faster and better sharing information through IT leads to a more accurate communication and with it to improve the professional status of police [14]. Even if the analysis does not show any sign of direct change of "police styles" [14], the study clearly reveals that the use of IT in the police work offers the option for police managers to control and monitor tasks.

Whereas Chan study shows that police feel limited in their actions and decisions through the use of IT, particularly in running criminal cases [13], Meehan comes to an opposite conclusion in his research about the use of mobile data terminals [45]. This author shows that the use of IT brings more autonomy in the police's decisions because police does not need to directly connect to dispatcher in the police headquarters and thus, the police managers do not have the overview of the street police anymore [45].

In sum, the analysis of the influence of E-Government in the police shows that particularly IT tools are changing many aspects of police work, organizationally, professionally and socially. However, empirical analysis of the concrete influence of E-Government and especially IT in the police work are still rare [12], [13]. The scarce existing research show disparate results: 1. The influence of IT is limited, because IT must be adapted to established structures and traditional role images. 2. The use of IT in the police work has enhanced the detective tasks through for example the implementation of crime reporting systems since many years [32]. 3. The use of IT in police work has a significant influence on the thinking and acting of police as well as on their reporting [24].


A theoretical basis for the analysis of E-Government and Professionalism does not exist in any of the disciplines (public administration, sociology, and psychology) related with the issue. Our theoretical corpus relates to professionalization theories that have been particularly applied to the analysis of the transformation of work due to the use of IT [1], [6], [59]. We depart from the idea that the introduction and further development of IT in the for the work practice contributes to the transformation of the discretion, motivation, competencies as well as skill requirements and in definitive of professionalism. Some parts of the work structures are standardized and integrated in technologies or delegated to these. Thus, the discretion of experts shifts, which might increase or decrease motivation. Moreover, whereas new competences overlap with some needed for previous work routines without IT, other formerly fundamental competences become obsolete. For the existing curricula this transformation has the consequence that qualifications and work practice do not fit to each other and the curricula, certifications or continuous training are rapidly questioned. Thus, transfer competences of IT experiences between life and work becomes increasingly relevant. From a generational development point of view a paradoxical situation emerges: through the delegation of tasks' parts as well as some discretionary aspects of work to IT the relation to the work practice changes for experienced workers so that uncertainties about their competences and their professionalism emerge. Whether these uncertainties also lead towards a discretion limitation and motivation decrease is an empirical question to be analyzed for each particular professional area. For new working generations, who can transfer their IT experiences from other life areas, the risk of competences' obsolescence and habit or professionalism dissonance is less even if they cannot use previous work experiences. In sum this means that "improvisation competences" are required or in other words, professional discretion becomes
increasingly unlinked to formal qualification paths and more and more connected to the continuous adaptation of formal knowledge to rapidly changing contexts due to the influence of IT use. Co-operation as well as conflicts between established work jurisdictions might also emerge and can lead to the transformation of work structures and organization to which power and professionalization processes are connected [1], [16], [64].

Summing up, we define work organization as the form in which work as structure, process, achievement and paid task is related to particular qualifications, competences, skills and knowledge by several actors in different production, public administration or service areas. Competences represent the control of a particular successful implementation of rules (capabilities and skills) on the basis of the knowledge potential of an actor [64]. The concrete requirements linked to a particular work context are the competence requirements. We understand professionalism as the willingness, capability and discretion of experts to adequately apply particular knowledge and competences to a concrete case in a work context (legitimation and recognition of work agency). The willingness refers to the motivation to accomplish a particular work task according to established and recognized rules in a particular working field. To accomplish the task in a professional way, persons have not only to follow recognized rules, but also have to be capable of undertaking the tasks in a way already defined as proper by professional regulating groups. These capabilities are learnt in certified training tracks institutionally enabling persons to become experts in a particular field with capability to decide about problem diagnostics, include methods to solve the problem and to recognize the point at which the problem is already solved [1]. Depending on the complexity and implications of the tasks the required training is more or less theoretically or practice oriented. Moreover, there exist different historical and cultural traditions of defining professionalism. In general terms, professionalism in Anglo-Saxon countries is more practice oriented whereas continental European countries have more hierarchical system based on certified training tracks.

Relating these theoretical ideas to the analysis of E-Government and Police work, we can derive the following research question: How does the work organization and professionalism of the police change (division of work, discretion, and competence requirements) due to the use of E-Government tools (concretely, mobile IT tools)?

Our literature revision about this issue discussed above reveals that the police use of IT tools in their work practice increments the discretion requirements whereas at the same time, the work increasingly depends on the IT tools [14]. We extract the following theses from the revised literature:

1. The increasing introduction of IT tools in the context of E-Government innovation leads towards a growing networking dynamic between persons as well as between persons and tools and even between tools among each other blurring work divisions and tasks jurisdictions.

2. The digitalization, decentralization and bundling of tasks displaces the tasks' priorities towards IT emphasizing the "street-activities" of police officers.

3. The increasing digitalization at the level of working practices contributes towards an on-going standardization of police work changing professional requirements.

Whether the work motivation and attitudes of the police officers change due to the use of IT in their day-to-day work practices and how their occupational identity and professionalism is transforming remain as open questions related to these theses.

The results of the COMPOSITE-Research project reveal that the acceptance of IT tools in the police work practice is poor. This insufficient IT acceptance is more common among elderly officers, as Behr comments [4]. This brings into question how the E-Government innovation phases related to the concrete introduction of the IT tools are designed, managed and implemented. Which actors are involved and informed as well as what kind of support and supervision they have particularly received. How does the police use of IT as well as the way of innovation development – understanding both as the development of E-Government in the concrete context of police work – influence its professionalism? The results of our research in other contexts of E-Government can offer some insights to operationalize this question in the particular context of police work [61]. From these research results we extract the following theses regarding the transformation of the "act margins" or in other words of the degree of discretion of police due to the use of IT tools in work practices:

1. The increasing IT use requires a decentralization and de-placement of tasks that lead to an integration of activities and delegation of responsibilities and thus to an extension of police officers’ discretion.

2. Work flexibility grows due to the extension of discretion and with it the subjectivation of work also increases.

3. Through the extension of police officers’ discretion a new professionalism emerges that integrates the use of IT tools and its implications related to accountability.

Another issue related to the transformation of professionalism and E-Government developments is
the change of competence requirements because of the use of IT tools in the work practice. "Computer knowledge" [4] and "Social-Media Analysis" [65] are increasingly required. Particularly this last aspect is not integrated in the current curricula of police training. The form in which computer competences are integrated in the police training curricula should as well as their effective transfer in the police work and their connection to concrete career paths are still aspects of police professionalism to be analyzed. Moreover, the possible generational conflicts between experienced police officers not so intensively socialized with IT and social media and the newcomers with a more extensive experience with these tools outside the work context is another aspect that might impact the transformation of police professionalism which hasn't been analyzed yet. Which new competences are needed for the use of E-Government tools in the police work and how and in which extent should they be formalized or standardized? How should these competences be connected to particular tasks jurisdictions? Should they be a part of the qualification required to become a police professional? For the operationalization of our research ideas about the transformation of professional competences due to the implementation of E-Government in the police work we formulate the following thesis:

1. Due to the expansion of the work division related to the impact of E-Government implementation in the police work, co-ordination and communication competences are increasingly required.

2. The digitalization of police work through E-Government implementation changes the competences requirements for the police emphasizing the need of self-confident and self-responsible use of IT tools.

4. Methodology

Due to the novelty of the analysis of professionalism and E-Government in the context of police work, our research has an exploratory character. We have selected an exemplary case study restricting our analysis to the perceptions of police officers about the impact of the use of the new interactive patrol car on their work and perceived professionalism. We applied a qualitative methodology based on interviews (seven experts: two police officers who work with the new car; two police officers working at the headquarters; two project managers from the police; one IT project manager) and visits (at the police headquarters and stations) as well as internal documents analysis taking the interactive radio patrol car in the Federal State of Brandenburg as a research case. Based on this exploratory case we analyze how the introduction of a new E-Government tool affects the work organization and the perceived professionalism of the police, its required competences and discretion.

We fully transcribed the interviews that lasted around forty minutes each. We conducted an inductive codification of the transcriptions aided with the software program NVivo and discussed our findings in a workshop with further experts working in the police context, in public administration area, at the university of the police as well as in innovation management in order to validate the interpretation of our results.

Case study – Introduction of the interactive patrol car in the Federal State of Brandenburg:

The interactive patrol car constitutes a mobile workplace for police officers. The project "interactive patrol car" started in April 2006 and the first interactive car was launched in September 2010. Since November 2014 thirty interactive patrol cars are in use for guard tasks as well as on highway patrols.

The main reasons to introduce the car in the police work stated in official documents were the possibilities for efficiently using resources and saving money, especially before the background of the population reduction in the rural areas of the Federal State.

The particular region where the project has begun is sparsely populated and the police stations are far away from each other. Thus, the idea behind the project was to shift police services into cars bringing them closer to the citizens. The cars are equipped with a multifunctional computer which enables remote access and transmission of all relevant documents and information for police operations as well as video communication and navigation technologies. Previously these tasks could only happen at stationary police offices. However, the headquarters still manages the coordination of the operations. The cars can record (crime) scenes and directly send to the headquarters, they can save them for the documentation of operation cases. Moreover, the headquarters can track the cars' routes and send support in danger situations. Nevertheless, the region is still developing its broadband infrastructures and the connection systems often fail. This means that the police officers very frequently are only connected to each other through the traditional radio channels. Thus, the multichannel possibilities are positive for the police operations. However, mostly elder police officers tend to use more frequently the radio channels due to their work habits hindering a rapid adaptation to the new system. Moreover, due to the existence of different channels, the headquarters must deal with a larger amount of information transmitted parallel to each other.
The police officers themselves were involved in the implementation of the project providing them with information about the new cars and the possibilities they offered.

The hardware and software developers designed the systems with the idea that the police officers could "intuitively" use the technologies without particular learning efforts. Thus, the police officers do not receive training courses to use the system, but only some functional advice mostly related with data protection.

Even in some areas of the police organization the introduction of new IT seems to be very innovative (i.e. data mining, big data, fingerprint recognition, etc.) these technologies have not still approached the street-level of police work where we focus our research on.

We emphasize that our analysis has an exploratory non-representative character due to the novelty of the research issue in the context of the police work. Furthermore, we focus on the perceptions of the police officers without considering the views of the citizens about the possible effects of the E-Government on police professionalism. Thus, we concentrate on the perceived professionalism of the police officers. In addition to the self-perception of the police officers as professionals, police officers are recognized professional experts in a particular jurisdictional field on the basis of their training, qualification and official integration in the certified German police system.

In order to estimate the possible transformations of the police officers' perceived professionalism brought about by e-police systems we asked the officers about their opinions about the changes they have noticed regarding their services to the citizens since they began to use the new system.

5. Results

The results of our research reveal that the introduction of E-Government tools in the police' work practice not only have intended effects, but also unexpected impacts. Despite the expected increase of work efficiency, new tasks and communication situations emerge with their own competences requirements.

The work organizational division between the headquarters and the police at the street working with the car technologies changes due to the direct digitalized access to data and information from the car. The headquarters is in part relieved from its role as information deliverer. However, the personnel at this work organization location must confront the filtering and processing of larger amounts of data and information newly available due to the implementation of IT tools (for example the visualization of geographical data). At the same time the police officers can visually identify the position of their colleagues and can decide with them about interventions in particular operations. So, for example, explains it a police officer: “directly say 'I need it'. In cases of manhunt this is very important or when I decide to establish a barrier zone. This means that you get a notification about an accident, three cars – you don't know whether road closures are required or diversions, etc. This comes through the judgement of the situation on the field. Thus, the officer begins to think in small teams down from the car including the perception of other colleagues. These are changes.”

The headquarters undertake a stronger coordination role because of the new visualization possibilities and the options of the police officers to directly contact their colleagues for intervening in operations. A police officer from the headquarters comments: “And they (the headquarters) can operate (through the visualization of the patrol cars) beyond jurisdictional boundaries. They clearly get more responsibility. They have demanded the assertiveness as headquarters because until now it wasn't so. Now they have to say to the patrol car in the near, but not particularly responsible 'you go to this operation now'. If he had said 'It's not under my competence' in an insolent mood, now he says yes. So, the interaction in the sense of management is stronger now.”

Moreover, the police officers at the street level shift their office tasks to their time at the street due to the possibilities enabled by the new car technologies. The police officers perceive this shift as positive time saving since they can use "dead-times" at the street for office work and don't have to spend time in the office which police officers usually don't like as one officer commented. They get the feeling that they can better serve the citizens on the field.

From the perspective of the interviewees, a wide standardization of tasks and competences hasn't happened due to the implementation of the new E-Government tool. However, the categorization of offenses necessary to process the data is in continuous progress and contributes to build a systematic basis for police discretion. This categorization is necessary for the police work as orientation to define the particular cases they confront in day to day activities. Police discretion is also guided through these categories, so that police officers can estimate the procedures to be taken in particular cases.

Moreover, the degree of discretion for the police working at the street level has grown due to the option of using more and qualitatively better information for the estimation of the particular offenses. Thus, police officers can better legitimate their professional
decisions without the decisions of the headquarters and have more decision freedom which is frequently non-rational. As a police officer comments: "for normal facts the decision must frequently be instinctive".

This means that the police officers can themselves better make diagnostics and inferences [1] in the operation field due to the more accurate information they get through the new car technologies. Even if established hierarchical rules must still be followed, police officers become more responsibility for their decisions. Thus, for example, the decision for supporting particular operations is no more dependent on especial jurisdictions, but on the casual nearness of a particular car to the operation field which can be tracked from each car.

A police officer explains: “We operate with the car that is nearest to the operation field. Previously there were fields, protected fields and the police officers have only left these fields in exceptional cases. He has always stayed at his protected field. We did not either know where he was and now we have the overview about where he actually is and operates when there is a common operational field. He also operates in cases in which previously he would have said 'one moment, this is not mine'. This discussion does not exist anymore, because we really decide according to nearness and urgency". The filtering and processing of the growing amount of available information and data also requires particular competences and working time. This does not mean that the police officers do perceive an opportunity to increase their professionalism understood as a "service for the citizens" due to the option of delegating routine tasks to IT tools or to speed up the routine office work with these E-Government tools. Even if the implementation of the IT tools has also brought more rules for the work practice due to data security legislation, police officers do not perceive them as hindering their day-to-day professional practices.

However, the motivation to use the E-Government tools at the street level police work depends in great extent on the technical affinity of each police officer which very often is not just a question of formalized qualification, but on informally adopted competences beyond professional boundaries. Particularly elderly police colleagues with long professional habits without E-Government tools are less technology affine and show more difficulties to use them. This is particularly the case when IT professional competences must be shown in interaction with the citizens, for example for processing citizens’ data directly in the police cars. The perception of losing professional authority in interaction with the citizens is moreover aggravated through ergonomic problems inside the cars and even exacerbated when the technology does not respond as expected. This is often the case in many areas of the region where broadband connection is not covered. This is particularly de-motivating for the use of E-Government tools in the police work. In these cases police officers frequently use their private mobile phones. A police officer comments: “you hear it through the radio channel, 'then come through wire'. 'Wire' means 'use your mobile phone, call me and explain something to me'. Of course this it is restricted to send information. He cannot write a book about the information he has to transmit.”

This informal use of an alternative IT channel contributes to increase professionalism from the view of the officers since they can themselves better decide how to operate or in other words how to offer a better service to the citizens.

6. Discussion

In this paper we have shown how the implementation of E-Government in public organizations contributes to transform professionalism. We have departed from the concept of professionalism understood as the willingness, capability and discretion of experts to adequately apply particular knowledge and competences to a concrete case in a work context (legitimation and recognition of work agency). Work contexts are from our view framed in a particular work organization understood as the form in which work as structure, process, achievement and paid task is related to rules and particular qualifications, competences, skills and knowledge by several actors in different production, public administration or service areas. Both qualifications as recognized formal knowledge basis for confronting work requirements as well as competences as the control of a particular successful implementation of rules (capabilities and skills) on the basis of the knowledge potential of an actor [64] are the legitimate pillars of professionalism. E-Government innovations introduce new rules for the work practice that might also affect work structures and divisions. However, the particular effects of the concrete implementation and use of E-Government tools in work practices, work organization as well as in the interaction between both are still unknown.

To contribute to bring some light on this emerging issue we have taken the case of the police as a research case and have empirically concentrated on the question of how does the work organization and professionalism of the police change (division of work, discretion, competence requirements) due to the use of E-Government tools (concretely mobility IT tools) and more concretely of the interactive patrol car.
The analysis of our case study shows that due to the use of IT tools in the patrol cars, the basis for taking decisions in the work practice becomes visible and accessible in real time for the police officers working at the headquarters as well as for those working with the car at the street. For the co-ordination of both working groups this requires more flexibility and improvisation. How both groups negotiate their decisions depends on each case. In any case professional discretion expands for both, because the amount and accuracy of the information available to solve the work practice cases is higher than without IT tools.

Another implication of the implementation of E-Government IT tools in the police work is the increasing work burdening for the police officers since they have to take into account a higher amount of information than before. Moreover, new competences are required: police officers increasingly must decide by themselves which particular information is relevant and have priority for each particular case. How this emerging "prioritising" of information is legitimised and institutionalized in the professional qualification paths is still open. In any case, legal questions concerning data security have been integrated in the police curricula which is particularly relevant for the required competences of using visual data from the cars' cameras. Police officers’ professionalism does also change due to their responsibility on the decisions of using or not the available technologies in the car. However, when the car technologies do not work, police officers must use the traditional communication tools. This means that the new police generation must develop competences for the traditional as well as for the emerging E-Government tools which might represent a particular burdening for newcomers who do not have many opportunities to learn how to use those tools in the new work organizational context without alternative.

These implications of the implementation of E-Government for the work organization and for the professionalism remain invisible due to the positive connotation and pressure of innovation. The qualification remains the same and just some legal issues have been introduced in the curricula regarding data protection and security. In sum, E-Government contributes to transform professionalism from the bottom of the work practice. How this changing day to day work practices will effect the transformation of the legitimate basis for work, the qualification, is still an open question to be analyze from a long term research perspective.

Our case study has two restrictions: it focusses on only one region in Germany and is not representative for the whole police organization. Moreover, it must be taken into account for further research that in the police context professionalism has an exceptional character related to the exposure to danger of own life, self-sacrifice and use of violence which is not applicable in other areas of public management and E-Government. The perspective of the citizens about professionalism and E-Government should also be taken into account for further analysis. An wider examination of the case in other police work areas as well as a comparison with other public organizations including the view of the citizens would bring more accurate answers to the question of how E-Government is affecting professionalism in public administration.

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