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ORIGINAL RESEARCH

Exploring Opportunities with Experimental Use of Communicative Spaces to Overcome Defensive Routines and Increase Information Systems Utilization

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Abstract
Both organizations and the information technology (IT) community have long worked to overcome the common problem of dissatisfaction with IT investments' outcomes in multiple ways. Much attention has been on users' involvement in IT design, while users' engagement in later further utilization of IT is less explored. This paper reports on action research (AR) that sought to stimulate local learning processes and increase the exploitation of a case-handling system. The experiment is done in a county administration where the senior management has, for some time, felt that the IT is not fully utilized. The local intervention was based on an awareness of a need to overcome defensive routines to establish communicative spaces to facilitate communication between various units with strong local identities. The AR project was carried out in three local interventions and presented as an experimental approach. We could not guarantee that the design could overcome the issues identified after the first round of interviews with senior management and department managers. The intervention process espoused various defensive routines, even some that the communicative space approach could not overcome. The outcomes from the three experiments are, therefore, mixed. The results indicate that creating communicative spaces is a viable approach to engaging users in systems development. Nevertheless, defensive routines, reluctant managers, and communities of practices hamper the development of communicative spaces.

Keywords Action research · Communicative spaces · Community of practice · Defensive routines · Experimental · EDMS

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Introduction

The outcome of IT investments takes time to evolve (Trieu 2017), and the effects materialize in complex ways (Schryen 2013) and in several steps that cascade into improved productivity and quality (Markus and Soh 1995). With some systems, as Electronic Document Management Systems (EDMS), the full benefits require a period of continued adaption and development of the organization, processes, and technology (Pan 2017). Some report EDMS implementation and use as a wicked problem (McLeod and Childs 2013) while others characterize it as a complex process (Pan 2017). The role of users has been deemed critical for the successful utilization of IT (Kim and Kankanhalli 2009; Löfstedt 2007). Much research on EDMS has focused on identification of critical factors (Pan 2017) often based on surveys and single case studies or metanalysis of publications (Alshibly et al. 2016). EDMS research indicate that 'people issues' are critical (McLeod 2012) and that EDMS is about changing ways of users work, thinking and acting that evolve in unpredicted ways during implementation (Pan 2017).

A large amount of research has been dealing with how to engage users (Bhattacherjee and Premkumar 2004), principles for a user-centered systems design (Gulliksen et al. 2003), and what explains users' resistance towards IT (Kim and Kankanhalli 2009). The role of users has been investigated with a socio-technical approach (Camara and Abdelnour-Nocéra 2013) that found that user participation in the design and implementation process benefitted from an interactive approach. AR can ease the implementation process of IT management systems by investigating the problems and requirements needed to overcome barriers for use (García-Unanue et al. 2015).

In some cases, users have deliberately been marginalized during systems implementation (Lyytinen and Newman 2015) to get the system technically in place. With EDMS, the most significant benefits come when the system is adopted and incorporated into daily practices. EDMS is increasingly perceived less as a technical innovation, but rather a social one (Jones 2012). AR researchers have found that issues with insufficient use of IT can be traced back to lack of understanding of the assumptions behind the technology and the underlying complex organizational issues (Bentley et al. 2013). A critical assessment of traditional project management approaches to electronic government implementation challenges identified many shortcomings (Sarantis et al. 2010). The authors especially point to the need of a clear formulation and communication of the goals, the complex nature of the public administration, little knowledge transfer from one project to the next and the ignorance of the multitude of stakeholders involved that needs to be addressed and managed throughout the project.

The dominating understanding of users in IT's research has been questioned (Lamb et al. 2003). A critical awareness (Bentley et al. 2013) of the prevailing framing of users can help us develop approaches that can facilitate users' engagement by providing a space for communication beyond the reluctant users' notion. Lamb et al. (2003) point out that prior research has often understood users based on an individualistic model. Rightly IT users should be considered social actors, engaged in multiple ongoing activities, relating to others, and often using various systems and technologies. Besides, as Lamb et al. (ibid. Lamb et al. 2003) point out, users often do not consider themselves as 'users,' do not like to be addressed as 'users,' and are heterogeneous. Many users often do not even want to be talked about as someone who primarily deals with computers, but instead sees themselves as professionals who use IT to support their professional activities. To facilitate IT, communication and collaboration between IT specialists and users are essential (Bentley et al.

2013). It has been shown that the real gains from IT investments are first achieved when users explore various systems features, and this can be stimulated through AR (Maruping and Magni 2015). AR can help enrich learning between groups (Liu and Tsai 2020) in private and public organizations (García-Navarro et al. 2019). Communication is essential in establishing a flow of interaction and the establishment of a dialogue. There is a tendency for groups in organizations to shape their identities based on their repeated interactions (Brown and Duguid 2001). Those can lead to different communities of practice (Lave and Wenger 1991).

Local communities and local practices form identities, and knowledge becomes sticky (Brown and Duguid 2001). Communities are having a particular way of understanding the world and making sense of it, which does hinder cross groups interaction and fertilization across the organization and creates what has been called structural holes in the organization. "People focus on activities inside their group, which creates holes in the information flow between groups, or more simply, structural holes" (Burt 2004: 353). Burt suggests that brokers are needed to span across these holes, although integration is not easy (Burt 2004).

Some prior research have shown that it is possible to established and maintain productive relationships between different groups of IT specialists and users (Newman and Robey 1992). Understanding the identity, practices, and assumptions of local communities (Brown and Duguid 2001) is a key to setting up a communicative space for the exchange of views and, hopefully, a shared understanding of potential ways of improvement.

Research on post-adoption use of technology suggests that the real gains from investments in collaboration technologies are realized when users explore various system features and get the EDMS well integrated into their practices. Some have labeled it as "post-implementation" within IT research (Cooper and Zmud 1990), i.e., analyzing and working with systems after the system's initial implementation. Although there exists sparse research on the subject, it has been shown that empowerment and support to employees and teams can make a difference (Maruping and Magni 2015). Bentley et al. (2013) showed that it was possible to improve a university system using AR with critical thinking to identify underlying problems and subsequently identify creative solutions that improved the situation. On the other side, as already noted by Smithson and Hirschheim (1998), IT is so complicated and sophisticated that there is a need for collaboration between users and IT specialists.

A participatory AR approach is chosen, where researchers become facilitators, thus applying some of the philosophic underpinnings represented in local system intervention (Flood 2001). AR has sometimes been disputed as a viable research method, although there seems to be a consensus–also withing IT–that AR is an appropriate method (Avison et al. 2018). In their review, Baskerville and Wood-Harper argue that the limited number of AR examples in IT is due to IT's foundation in computer science and engineering, which favors natural science approaches applying methods and explanation building based on mathematics and physics (Baskerville and Wood-Harper 1998). A special issue on AR in IT research in one of the leading journals in North America (MIS Quarterly) six articles were deemed qualified for publication (Baskerville and Myers 2004). Williams et al. (2009) confirms the dominance of a positivistic paradigm withing most research on IT. In a review on the application of Multiview and AR Watson (2012) reflects that new technology adoption and diffusion has been subject to much research, but mostly quantitative and lacking qualitative research such as AR that is able to better incorporate social factors at individual and organizational level.

The intervention in the present AR aims to improve administrative processes by applying a collaborative practice (Mathiassen 2002) focusing on stimulating dialogue (Mårtensson and Lee 2004) by creating communicative spaces (Kemmis 2001; Wicks and Reason

2009). Thus, an experimental learning approach is adopted here, and as advised by Robey et al. (2000), using AR to IT to make research more relevant to practice (Baskerville and Myers 2004).

The study involved three units within the same county administration to make it possible to compare the initial settings, the context, the processes, and the outcomes of these "real-life experiments" (Ziman 1978). Other AR researchers have studied IT diffusion and assimilation by comparing two cases (Cataldo et al. 2018) or compared two universities to learn from (Rose and Saifullah 2012). The AR here is not a controlled experiment (Highhouse 2009) as there were so many factors that could not be controlled. Thus, research here has both traits from AR and experiments (Mathiassen 2002). The field experiment is driven by our intention to test if collaborative AR using communicative spaces can facilitate improvements in the EDMS use.

A big challenge, of course, is to conclude due to the many uncontrolled different factors as "[a]ction research provides direct access to practice, but it is quite difficult to control the research process" (Mathiassen 2002, p. 330). Although researchers might try to prepare, analyze, and make agreements beforehand, the unfolding of the process is dependent on factors that cannot be controlled by the researchers. These drawbacks are outweighed by the benefits from an engaged-scholarship approach (Van de Ven 2007) done with rather than for practice (Karlsson 2016). According to Coughlan and Coghlan's (2002: 227) criteria, AR is appropriate when trying to understand how "action can change or improve the working of some aspects of a system and understanding the process of change or improvement to learn from it."

The Problematization

With great efforts and resources, Countryside County (CC) had over more than eighteen months rolled out state of the art EDMS to support the administration in all units in the geographically dispersed county. More than a year later after the final official implementation of the EDMS had finished senior management is disappointed with the utilization of the system and did not fully experience the promised improved case handling, increased speed, and better administration. In many units, the EDMS integration with other systems' is not completed. In some departments, several older systems are still in use. CC senior management experience that the EDMS's lack of utilization affects the efficiency of the information flow in the administrative units and makes it difficult for the central executive department–expected to assist the elected politicians–to deliver the desired better service. IT becomes appropriated in local practice in unanticipated ways (Arvidsson et al. 2014) but it was not a question for senior management about homogeneity, but that the EDMS was not appropriated enough. The EDMS was technically implemented but weakly and unevenly organizationally implemented (Arvidsson et al. 2014). It had become a part of the routinized work of many employees (Cataldo et al. 2018) but had not produced the intended effects as expected by senior management.

A first dialogue between senior management in CC and the two researchers developed into a formulation of an AR project to try to facilitate an improvement of the situation. From the conversation's researchers did understand, that the dialogue between the IT specialists and the different user groups had been limited to technical issues. There was a need for creating situations where users could feel free to communicate about how they could consider if and how the EDMS could facilitate and improve their administrative tasks.

Given the complexity and size of CC the process should also facilitate conversations with different professional groups and between users and IT professionals.

The overall research question for the research project is: What can we learn from an experimental process using communicative spaces to enhance the use of EDMS?

The remainder is structured accordingly. First, the understanding of IT and users is discussed. Secondly, we introduce the use of communicative spaces as a vehicle for transformative learning. Thirdly the study design is presented before the case is presented. Finally, the AR project is analyzed before discussions and a brief conclusion.

The Understanding of IT and the User

IT plays a vital role in the public sector. It can break the barriers of inefficiencies in the public sector (Eyob 2004) by using IT intelligently (Fountain 2001), and IT projects can be the primary driver of business process change in the public sector (Scholl 2005). IT in the public sector has been studied as part of public sector management, e-Government, and implementation studies. IT has been defined as "denoting all the technology, both hardware, and software, used to store, process and transport information in digital form." (Carr 2004, p. xii). Research on IT in public administration is emerging (Moon 2002) and has suggested that goals and knowledge should be in place (Sarantis et al. 2011), together with adequate planning (Rose and Grant 2010). A tendency to apply a view from design science and focus on the technical design in public government research has been identified (Fedorowicz and Dias 2010). There is a need to bridge the design and behavioral research (ibid., p. 6) and consider organizational, managerial, and socio-political aspects (Dwivedi et al. 2009).

Much research on IT in the public sector seems based on theories of diffusion and adaption (Rogers 2003) with a focus on analysis, design, and communication, using goal-driven project-management approaches (Sarantis et al. 2011), while studies departing from within organizations and working with employees use of IT are rare. None of the studies analyzed by Norris and Moon (2005) seems to have focused on improvement in IT utilization using interventions at the group and intergroup levels. Yildiz (2007) asked for more process-oriented approaches in studies on IT in the public sector.

For decades users have been considered critical for the IT development, design, and implementation process (Camara and Abdelnour-Nocéra 2013) to connect the social with the technical (Rose and Saifullah 2012). The user has predominantly been seen as a provider of information on the relevant activities to be supported by the IT and widely published as user-centered systems design (Gulliksen et al. 2003), usability improvement (Henneman 1999) and general discussions about what user-representation is and what forms it can take (Johnson et al. 1999).

Recent IT research has called for a more interactive understanding of IT as technology and organizations co-construct one another (Sein et al. 2011). Instead of regarding the (technical) design process as one and the organizational processes later as another, it is proposed to consider it an interactive action-design-process with multiple iterations between the different domains (Borum and Christiansen 2006). Furthermore, IT researchers have urged for improved use of AR to improve the ability to address real-world problems (Rosemann and Vessey 2008). Mathiassen (2002) reports from a large study to enhance information systems development practices, which he labels collaborative practice research. He stresses that the "main concern in collaborative practice research is to establish

well-functioning relations between research and practice" (Mathiassen 2002). This is confirmed from action science (Dick 2019) and ALAR research (Zuber-Skerritt 2019; Zuber-Skerritt and Wood 2019). AR has been useful in generating shared understanding between individuals (Mathiassen and Sandberg 2013), groups (Bittner and Leimeister 2014), and in revealing how different framings among groups hinders collaboration (Young et al. 2016).

Communicative Spaces As a Vehicle for Transformative Learning

Professionals engaged in everyday activities develop their understanding through their practices and create what has been called a networked production that "focuses on the interconnected, situated actions of knowledgeable actors giving the product its form" (Nicolini et al. 2003). Through these practices, different professionals develop their understanding of what is essential and what is not (Jalonen et al. 2016) and establish their own epistemic culture (Cetina 2009). Different frames of understanding might make communication between groups difficult but can be increased when organizations face a dynamic situation and are asked to change (Young et al. 2016).

Recently the use of communicative spaces in AR has been presented as a vehicle to facilitate transformative learning (Wicks and Reason 2009; Eady et al. 2015). Communicative spaces might be valuable to overcome defensive routines (Argyris 1990) and bridge different logics or conceptual understandings of practices (Nicolini et al. 2003) and facilitate exchange between groups having different lifeworld's, to use a term from Habermas (Wicks and Reason 2009: 245). Eady et al. (2015:107) propose – in line with prior research (Wicks and Reason 2009) – that a facilitator can help professionals create and exploit an opportunity to engage in meaningful modes of collaboration, democratic and non-judgmental dialogue to solve complex issues.

The use of AR practices, with structured facilitation and the creation of communicative spaces for the free debate of options for improvement of IT to support administrative professionals, provides an opportunity to try to bridge between different professionals by challenging viewpoints, assumptions, and practices (Eady et al. 2015) and bring people together to work on agreed issues (Kemmis 2001). As Kemmis discusses (2001: 100), organizations and groups are often more fluid than researchers might like to admit.

Intervention methods are based on insights from organizational learning (Argyris and Schön 1978), also known as action science (Argyris et al. 1985). The original intention here was to stimulate a double loop learning process (Argyris and Schön 1996) by having employees and managers recognize the untapped potential in their information systems while two researchers acted as process consultants (Schein 1988). The concept of double-loop learning is based on Bateson (1987), who noted that most human learning is only single-loop learning, which occurs when trying to fix a problem within the existing frame of reference. Double-loop learning extends human learners beyond fixing; it constitutes an attempt to understand and question why problems exist, the relevance of those problems, and the importance of the issue, as well as requiring the actors to reflect on and ultimately change their behavior. With Argyris and Schön (1974: 19) words: "In single-loop learning, we learn to maintain the field of constancy by learning to design actions that satisfy existing governing values. In double-loop learning, we learn to change the field of constancy itself." Single-loop learning has been compared to a thermostat's function on a radiator (Argyris and Schön 1978:2–3; Argyris 1999: 151): it works according to preset objectives – a specific temperature. It does not question the relevance of that setting.

Change does not occur easily. Change implies that something can be better. It is not easy to admit, that one is not doing the very best. There is a risk of being blamed. Defensive routines prevent change from happening (Argyris 1990). As Dick (2019) states, actors that are focusing on their individual goals, maintaining control, trying to appear rational, maintain the existing dynamics. "They modify their actions to achieve their tacit guiding values. They leave the values untouched." (Argyris 1976). As Dick states (2019: 150) "Double loop learning requires examining and modifying the guiding values". This is where the defensive routines and standard behavior helps us understand how actors maintain the standard (single loop) behavior. Already Argyris was not optimistic about the chance of inducing change (Argyris 2004) and as Dick (2019) states "Attempts to remedy threatening situations are more likely to fail than to succeed." He further ascribes this to the norms that leads actors to protective and defensive behavior that further influences the culture of the organization, and to managerial organizational silos and individualistic performance management.

Argyris and Schön (1978) mention three preconditions for establishing double-loop learning: the changes must be based on valid information; the learning and changes must be based on the free and informed choices of organizational members, and the participants must agree on the changes. They further state that double-loop learning will influence individual theories in use (Argyris and Schön 1996). Theories in use are the basic patterns of behavior that guide individuals' actions – as opposed to the espoused theories that we present to others and announce as official strategies (Argyris 1990).

As change is difficult it is possible to signal change without changing. We can have official strategies and actual strategies. "Espoused theories are those that an individual claims to follow. Theories-in-use are those than can be inferred from action" (Argyris et al. 1985, p.82). Erving Goffman presented what he called a dramaturgical perspective in his 1959 book "The Presentation of Self in Everyday Life.". Goffman considered our life to be played on a stage, where we make window-dressing to present our best official version, while we might operate otherwise back-stage or even off-stage (Goffman 1959). This observation has spurred research in many areas, such as Mintzberg (1978) investigation of differences between official strategies and actual organizational processes leading to changes as emerging strategies.

If the objective is to foster change through an open equal conversation, defensive routines with front-stage and back-stage behavior is problematic. A defensive routine is defined as "any policy or action that inhibits individuals, groups, intergroups, and organizations from experiencing embarrassment or threat and, at the same time, prevents the actors from identifying and reducing the causes of the embarrassment or threat" (Argyris 1990). The concept of differences between what we say and what we do expressed as theory-in-use versus espoused theories has been investigated in prior research.

Wadsorth and Epstein (1998) investigated the voices of the staff versus consumers in their conversations and analyzed in a collaborative AR project what was the espoused theories and what the theory in action was. This AR project were also able to work further with consumers on what type of conversation and values they would prefer to have. Discrepancies between teachers' espoused theories and theories-in-use was explored by Harnett (2012). By mapping existing beliefs and behavior discrepancies between these and the espoused theories incremental improvement activities began. Savaya and Gardner (2012) explored how theories in use differed from espoused theories and used it for development activities among social workers. Comfort et al. (2019) found that defensive routines used by especially lower organizational levels prevented clear communication between different hospital units during the H1N1 threat in 2009–2011. Espoused theories might seem

favorable towards new technology but actors might have values and behaviors that produces defense routines that sends an organization into vicious circles that represents barriers for change (Henfridsson and Söderholm 2000). On the surface the public organization studied is favorable towards new technology, but the employees consider using technology as something that increases focus on administration rather than case handling.

The collaborative efforts in an AR project might be challenged by deadlines for project closings as this might lead researchers to try to regain control over the project and exhibit defensive routine (Jacobs 2010). A defensive routine can keep non-productive behavior to continue for years as Brady and Maylor found in their study of a project-based organization (Brady and Maylor 2010). Organizations might refuse to experience the embarrassment of changing a low performance situation and allow it to continue for many years.

Krzysztof and Davis (1991) are critical about how the official strategy of an organization is not followed to gain short term advantages, by the very same people who formulated the strategy and who hereby are missing long term opportunities. Finally, on the level of organizational analysis not all consider discrepancies as problematic. It might be a deliberate strategy to handle e.g., conflicting external expectations. What is said might be different from what is done, as organizational hypocrisy makes it possible to change nothing substantial (products) but send a signal about (potential) change by talk or making decisions—that are not followed by actions. Thus, hypocrisy becomes a substitute for real change (Brunsson 1986).

Experimental Study Design

Departing from the initial connection between senior county management and the researchers and agreeing to experiment to facilitate an improvement of the utilization of the EDMS, the next consideration was on the type of AR. One of the researchers had experiences conducting AR in a large organization using clinical AR (Schein 2002), but the county's context differed. Another form of AR was needed here. An approach that could stimulate and engage employees directly in an emancipatory process (Flood 1996) by involvement in problem identification, prioritization, and discussion about possible solutions, where the two researchers worked as facilitators but not decision-makers. Especially relevant here is dialogical AR that accepts that the employee is an expert on her/his own situation and organization (Mårtensson and Lee 2004) and an AR approach that recognizes the need to understand the different thought worlds and try to bridge these (Rose and Saifullah 2012).

The approach in the present research to facilitate a systematic AR improvement process and use action science is discussed by Dick (2019), Zuber-Skerritt and Wood (2019), and Zuber-Skerritt (2019). The research here draws on theories on single and double-loop learning and defensive routines from Action Science (Dick 2019), often ascribed to Action Learning (AL) and approaches to improve practice by understanding a situation and its complexity stemming from AR (Zuber-Skerritt and Wood 2019). AR and AL have emerged from different geographical locations, and they are based on research conducted by scholars in separate academic thought worlds, but AR and AL share "philosophical assumptions and values" Zuber-Skerritt 2019: 71). Some authors continue to stress the differences between AL and AR and states that AL "is fundamentally an educative process with its focus on learning, while action research places its focus on research and positions itself in contrast to traditional positivist research methods." (Coghlan and Coughlan 2008). The present AR project uses theories from AL to reach the objectives of AR. It is now

common to talk about ALAR within the participatory research paradigm. Action Learning and Action Research is today considered as "an integrated concept and practice" and as "the basis for other action research genres" such as action science (Zuber-Skerritt 2019: 69). Further, Zuber-Skerritt notes that there is no one theory of ALAR but that many possible theories are within the paradigm. Each research project and researcher must consider what is appropriate in the specific situation, task and context (Zuber-Skerritt 2002, 2019). The process design chosen for the present project is shown in Fig. 1 here.

The AR here was undertaken with an experimental mindset. Lately, experiments have been divided into three types: 'in vitro' – as in a classical controlled laboratory setting - rather than 'in vivo'- as in a real-life setting - and as 'platform' experiments, and these three types are characterized by Muniesa and Callon (2007) primarily by their different degrees of openness. Others refer to the two views on experiments presented by Shady' et al.:

> *"1a) A test under controlled conditions that is made to demonstrate a known truth, examine the validity of a hypothesis, or determine the efficacy of something previously untried' 1b). The process of conducting such a test; experimentation. [or] 2. An innovative act or procedure: "Democracy is only an experiment in government."*

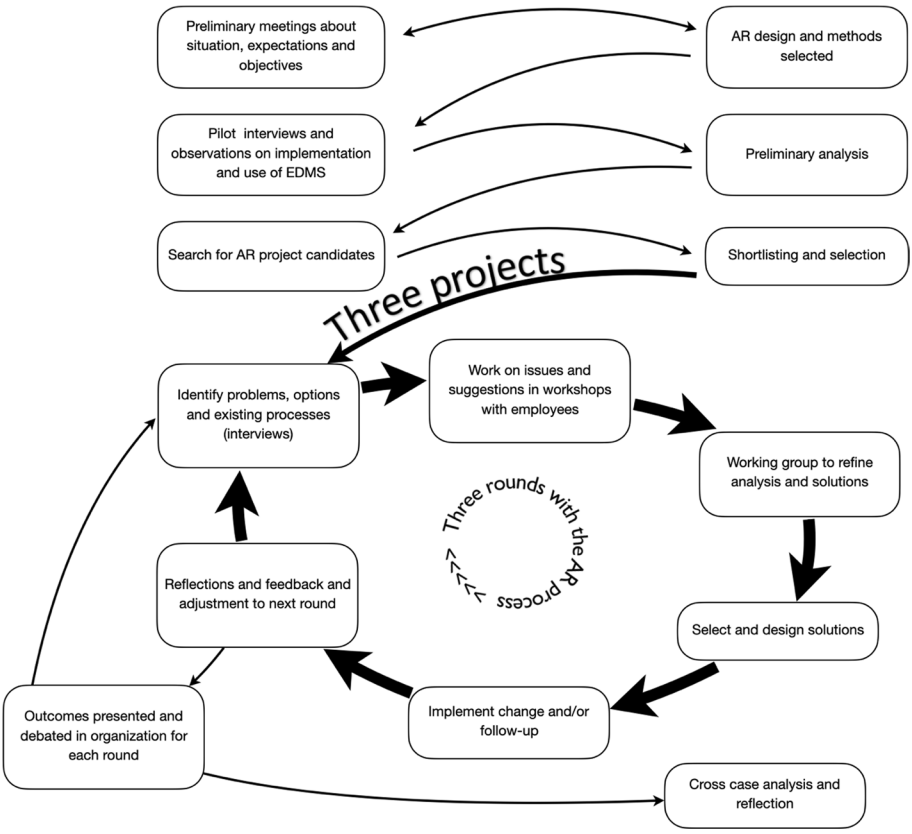

Fig. 1 AR project process with three sub-projects

The present research is not a test but an exploration, as referred to in [2]. The study wanted to stimulate double-loop learning processes (Argyris 1995, 2004) using several unobtrusive intervention techniques and the concept of communicative spaces (Wicks and Reason 2009). The results are analyzed within a framework of organizational learning theory, with particular attention paid to single- and double-loop learning processes and the organizational defense routines (Argyris 1990).

The AR interactions were carried out in three subprojects. Each subproject was planned to last six months preluded with preparation and planning and concluded with cross-case analysis and reflections as displayed in Fig. 1. Each subproject followed the traditional AR cycle and concluded with reflection and learning points to facilitate knowledge sharing from one sub-project to the next (Massingham 2015). A steering committee was formed to coordinate the AR project with the organization. This included the managing director, his deputy, and the two researchers, besides a local organization for each of the three subprojects with employees.

The sequence for each subproject followed the intervention strategy with six phases (Argyris and Schön 1978: 220–221): mapping the problems, internationalization (agreement), testing the model (assumptions), identifying solutions, intervention, and change, and studying the impact, and thus also following the much-used AR spiral in four steps: plan, act, observe and reflect (Zuber-Skerritt 1993; Kolb 1984). The interaction and dialogue with employees from the three organizational units were guided by the three features of communicative action (Habermas 1998) presented by Kemmis (2001: 100): creating mutual understanding, facilitating unenforced consensus about what to do, and trying to establish a communicative space. The communicative space is, as pointed out by Kemmis, essential as a safe and unenforced space for participants to raise concerns and engage in communicative action that can lead to changes "[o]nly when they give their own unforced assent will they regard substantive claims raised in these processes as personally binding upon them - or perhaps it would be better to say that, when a doubt arises about any such substantive claim, it will not be regarded as binding until it is underwritten by communicative action" (Kemmis 2001: 95–96). Fig. 2 shows the project process with communicative spaces ambitions in each sub-project.

In a project, that involves a diverse range of administrative professionals from different units and IT specialists, and researchers, each representing various communities of practices, the formation of a communicative space was essential, as Kemmis says (2001: 100):

> *"A communicative space is constituted as issues or problems are opened up for discussion, and when participants experience their interaction as fostering the democratic expression of divergent views. Part of the task of an action research project,*

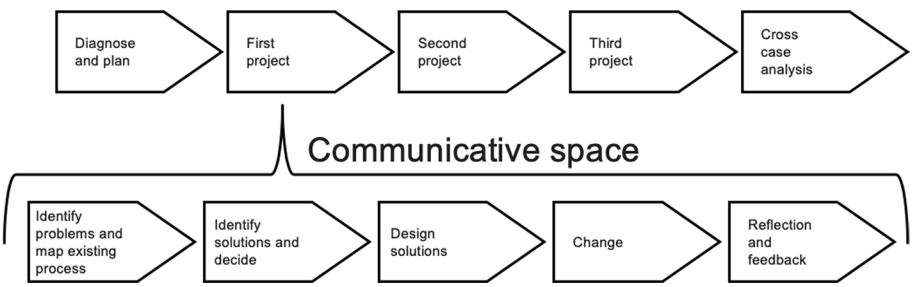

Fig. 2 Project plan with subprojects. Each subproject was intended to create a communicative space

then, is to open communicative space, and to do so in a way that will permit people to achieve mutual understanding and consensus about what to do, in the knowledge that the legitimacy of any conclusions and decisions reached by participants will be proportional to the degree of authentic engagement."

Brits (2015) used AR to work with stakeholders and was also inspired by Kemmis and Habermas and the notion of communicative actions in the efforts to reach a shared understanding of the challenges. Habermas describes communicative action as a "form of social interaction in which the plans of action of different actors are coordinated through an exchange of communicative acts, that is, through a use of language orientated towards reaching understanding" (Habermas 1981, p. 44).

Data Collection and Analysis

The data for this study comes from an empirical investigation undertaken by the authors. Data were collected over more than 18 months. The research used several sources of data: Several rounds of interviews were conducted. In total 29 interviews were conducted with managers and employees using a semi-structured interview guide. Interviews lasted between 30 min to 60 min. Interviews focused on providing background information on EDMS implementation, use of the system, administrative processes, collaboration and other organizational issues deemed relevant by the informants. An interview round was conducted before each of the three sub-projects. Interviews were transcribed on more than 236 pages. A list of interviews is provided in Table 1.

Onsite-Observations Throughout this study, one researcher spent more than 60 days on-site, while the other was involved in meetings and workshops during the project and in data

Table 1 Interviews conducted for background information

Background information. Interviews focused on background information and system implementation.	Ten interviews: Chief CC Administration, chief education and culture unit, It-department manager, accounting unit manager, manager from education, manager from the technical and environmental unit, an administrator from education unit, senior administrator, HR administrator, and healthcare unit administrator.
First sub-project. Interviews focused on the current use of EDMS and the administrative processes	Nine interviews: Senior administrator, manager from an institution, a consultant from the unit for adults' treatments, a consultant from psychiatry, and one legal advisor.
Second sub-project. Interviews focused on the current use of EDMS and the administrative processes	Five interviews: Senior administrator from the hospital, administrator from the hospital, one senior manager from the hospital, one manager from the hospital-planning unit, one administrator from health care insurance unit.
Third sub-project. Interviews focused on the current use of EDMS and the administrative processes	Five interviews: One sub-unit manager, two senior administrators, two administrators from budgeting. All from the accounting unit

analysis and reflections. Daily observations and reflections were entered into the project dairy that was discussed between researchers every week.

Another vital source of information where observations from the interactions (interventions) performed as part of the AR. Different intervention methods were used when deemed appropriate, but each subproject (besides the third) consisted of two workshops. The first workshop's focus was to map existing (workflow) processes that have been identified for improvement. The second workshop was oriented towards the future and generating suggestions and desired solutions.

A mixed-method approach with appropriate interventions was used to establish and make the communicative space productive (Austin and Bartunek 2003; French and Bell 1999). Interventions are "[s]ets of structured activities in which selected organizational units (target groups or individuals) engage in a task or a sequence of tasks with the goals of organizational improvement and individual development" (French and Bell 1999: 27). As the intervention process first aimed to identify potential areas for improvement and then generate possible solutions, the methods used in this study, as listed in Table 1 below, focused on information collection and scenario building, making it a relatively unobtrusive intervention. Thus, we did not engage in intervention techniques concentrating on developing communication patterns or norms and values (French and Bell 1999). The intervention methods used are listed in Table 2.

Another essential data source was material produced from the interactions in the subprojects and workshops. This consisted of flow-charts, posters, flip-overs, and notes taken by the researchers and minutes from the working groups after the rounds in the three subprojects, and the final reports to CC management. The observations and material produced before, during, and after the workshops are used in the analysis.

Archival Data Internal notes, strategy papers, action plans, memos, system documentation, guidelines, handbooks and reports were made available to the researchers and provided useful background information. Archival data provided useful knowledge in both preparing the interviews and workshops and when interpretation the collected data.

Documentation and Analysis

Data were collected throughout the study and stored in a shared database for easy retrieval. To ensure rigor and relevance in AR, Iversen et al. (2004) suggest using a set of questions to guide the analysis as follows.

- Experience with the use of information systems
- Initial attitude toward the EDMS
- Unit manager's attitude toward the AR project
- Employee attitude toward improvement project
- Does the AR project facilitate the mapping of existing processes?
- Does the initial stage lead to a shared understanding of potential objectives among employees?
- Does the process lead to a shared vision for improvement?
- Is it possible to identify solution(s) that include(s) whole group/unit?
- Is it possible to run the intervention process through the planned stages?
- Does the process lead to improved utilization of the system?

Table 2 Methods used

Intervention method	Content	Example of use
Data collection	Paper-based and electronic files collected, asked for, and given access to	It is providing background information on the IT, processes, and history of the organization.
Interviews	Around one hour interactions, based on open-ended semi-structured questionnaires, recorded and transcribed in full	Employees and managers within and outside the organization for contextualization
Observations	On-site observations communicated primarily between researchers orally or entered into the study database	When walking around, attending meetings, and talking to various actors
Dialogue	Informal talks and testing of thoughts, reflections, and ideas	Frequent interaction between researchers and employees
Meetings	With or without agenda	Coordination, information sharing, and debate
Workshops	Agenda drafted by process consultant (researcher) but open to the exploration of emerging issues. Workshops are focused on interaction, dialogue, and sharing.	In the three subprojects, map and analyze existing processes, identify areas for improvement, and establish a communicative space.
Workflow analysis	Diagrams, posters, Post-it notes (brown-paper approach), black- and whiteboards	Used as part of the workshops to map existing processes and uses of the system
Future workshop	A workshop designated for designing a desired future, involving the use of such methods as brainstorming, dialogue, and sharing of visions	Used in the first two projects
Brainstorming	Free flow of thoughts and reflections among participants, based on mutual trust and openness	Used as part of the search for solutions and ideas for improvements of existing processes and systems
Sharing of visions	Mutual exchange of futuristic scenarios	Part of interviews with participants and used as input to system improvements.

These questions inspired the pilot study and are later used for the cross-project comparison.

Internal validity measures included coding, checking, and re-coding by both researchers. External validity was achieved by presentations and discussions of the analysis outcomes with employees and the steering committee.

As AR and AL are both participatory paradigms, where the researcher is not an outsider, we recognize that knowledge is socially constructed (Zuber-Skerritt and Wood 2019). One implication of this is that variables are "not predetermined and controlled but are taken on board as they are identified from the emerging meanings" (ibid. page 8). Likewise, rigor in the analysis is achieved by triangulating multiple sources and methods and systematically seach for internal validation. Observations and analysis from the study have been discussed and validated by multiple site visits during and after the interactions and with continuous interactions and debates with various organization members at different organizational levels.

A critical reflective phase (Flood 2001: 255) between the AR researchers – involving the steering group – followed final reporting. Throughout the project, the concept of communicative spaces (Wicks and Reason 2009; Kemmis 2001) guided the ethical considerations. When feedback was given to each unit, it produced additional suggestions from employees that helped validate data and observations in their chosen format. Additionally, we received critical comments from employees about some statements included in the draft report they felt were based on observations outside the project. The specific quotes were removed from the final report.

The Case

Countryside County (pseudonym) (CC) encompasses around 20 smaller and larger municipalities and provides secondary schooling, healthcare facilities, and infrastructure for more than 250.000 citizens in a large, sparsely populated rural geographical area. Historically citizens generated income from farming and fishery while industrialization spurred lighter industry, manufacturing of farming machinery, and shipbuilding. More recently, ingenious black-smiths and inventors have created several highly specialized industries that have generated spin-offs into completely new environmental oriented industries. Some of these have become international companies. One implication of global success is that the shortage of highly educated and specialized labor becomes imminent, and relocation is needed for some companies. The total employment distribution in CC sectors is unique, with around 25% employed in manufacturing, while public services and private services engage 25% each.

CC employs more than 6.000 professionals in various units and specializations. Hospitals and health insurance account for around 50% of these, while primary social care and institutions account for 25%. Secondary schooling and culture account for 15%. Central administration, infrastructure planning, and accounting employ the final 10%. CC is the single biggest employer in the county. Most employees consider themselves primarily attached to whatever specialization they might have as the hospitals, the higher schooling, or the social institutions. Seniority is high across CC but is reversely associated with the level of education. The higher educated have a more significant turnover than the less educated. This goes for the central administration and especially for the hospitals. As doctors, economists and managers do have higher turnover than nurses, social workers, and schoolteachers. The CC has been struggling

with attaching and developing educational resources to the county to offer a highly skilled workforce and keep young people from moving to bigger cities. During the last five years several initiatives to set up educational options in CC on various levels has been launched. This includes collaborations with several universities by establishing local hubs in CC and engaging in networks. Other initiatives with a distinct practical angle include college courses in various manufacturing and trading specializations. The entrepreneurial spirit that has proven successful for the local businesses have entered into the public sector here in a way that has not been on the same scale before. The CC promotes initiatives and reforms that is aimed to support the reginal development and offer support for business development. Rather than traditional administration and social care CC also like to promote itself as a facilitator for innovation and being helpful.

The central administration for CC is collocated in the biggest city. Simultaneously, the administrative units for the specialized areas are geographically dispersed throughout CC, and the use of information and communications technology (ITC) has been a priority for many years. In the last couple of years, CC's administrative head has formed a 'dynamic duo' with the manager of education. They both have a university degree and have worked for CC for around five years. They have been spearheading various administrative reforms and promoting the CC to provide attractive new offers within schooling and culture. The administrative reforms have included investments in new technologies and change processes to integrate various units to act in a unified way, e.g., having three geographically dispersed hospitals to function as one unit. The politically elected head of the CC has supported these initiatives in several ways.

Figure 3 shows the formal organizational structure and location of the three subprojects.

The central ITC unit has in the last 18 months been engaged in the analysis and implementation of a case-handling system to serve all units in CC. The intention is to replace the paper-based case handling with the new system. The central IT unit officially finished implementing an Electronic Data Management System (EDMS) to serve all CC units more than one year ago. The intention was to replace all paper-based administration handling with the new system. EDMS is also sometimes referred to as a Document Management System (DMS). EDMS can receive, store, track, manage, share, and process the documents involved in administration based on both predefined workflows and ad-hoc workflows (Reijers et al. 2003). EDMS includes functions and capabilities sometimes associated with content management systems, legal document processing, enterprise content management, document imagining, records management systems. EDMS is considered a part of the public sector's digitalization towards excellence in e-governance (Saxena 2005; Van Der Aalst et al. 2005) and is sometimes referred to as an eGovernment Document Management System (Jones 2012). Often so-called workflow management systems offer the users one specific, fixed way of interacting, while EDMS is flexible (Van Der Aalst et al. 2005). EDMS can have some fixed formats and processes predefined by IT specialists, but the users can modify and design new processes and case-classifications to suit their specific needs and the role of a case handling system is assisting rather than guiding the user (Van Der Aalst et al. 2005). One significant change for users of these systems is to shift all documents and whole "cases" (tasks, projects, or activities) from a paper-based flow to a purely electronic flow.

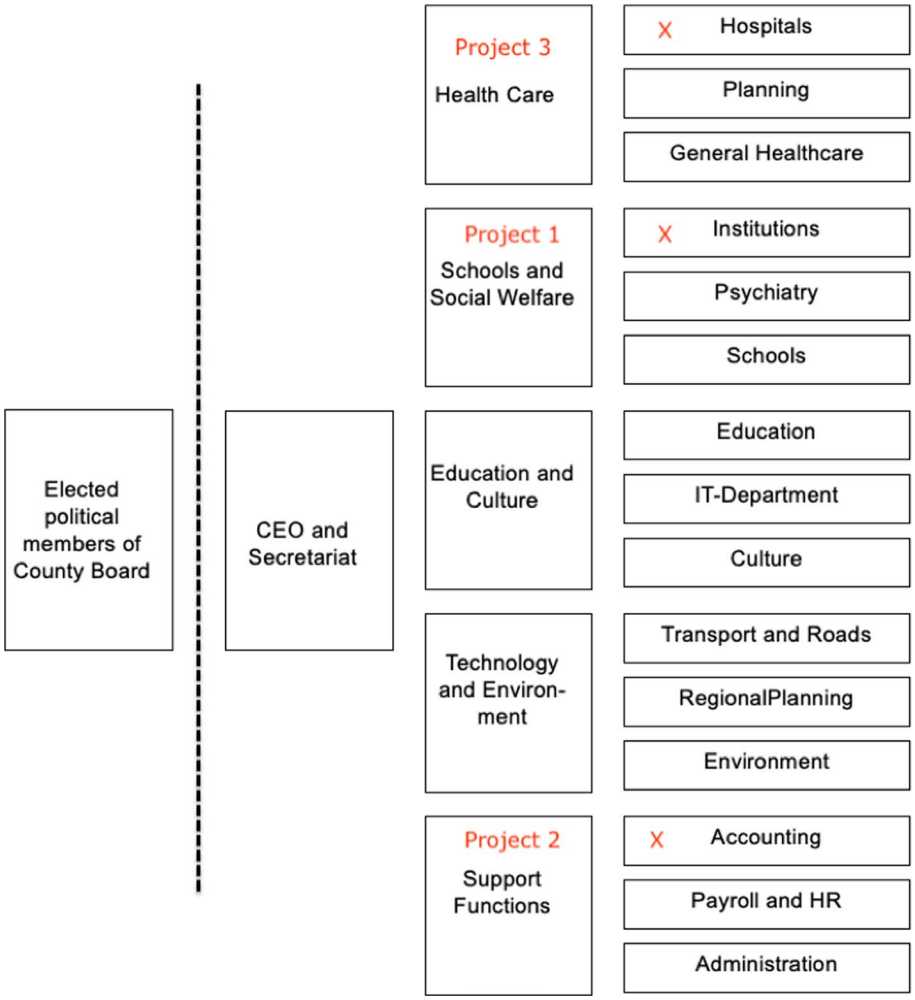

Fig. 3 Formal organizational structure and the three projects

The AR Process

This section presents the research and interaction process in the AR project in three steps. First the initial interview round. Second, the identification and selection of the first two AR sub-projects. Third, the three sub-projects are presented.

Observations from First Interview Round in Organization

Present behavior and preferences are based on individual learning (Simon 1991) and interactions in groups and communities (Lave and Wenger 1991) and their past experiences with the EDMS and implementation. As already March and Olsen (1975) stated,

"organizations and people in them learn from their experience." The past sum of experiences forms the learning encoded from inferences into routines that guide employees' behavior, beliefs, and culture (Levitt and March 1988). An initial interview round was conducted to provide background information inspired by the advice of Iversen et al. (2004) and their formulation of guiding questions. The first interview round focused on these three issues: Experience from the implementation process. Experience with the use of information systems. Attitude toward the EDMS.

The central IT unit (CITU) is responsible for implementing, developing, and maintaining the EDMS and collaborates with an external supplier with detailed technical knowledge about the EDMS. The CITU is the final decision maker for various IT-related decisions. Appointed super-users in each administrative unit are consulted and meet the IT unit in monthly information meetings. These illustrative quotes represent initial observations:

ITC senior manager: "We have chosen a standard system, so we did not have to modify the system to get it working in the organization."

Senior administrator: "We have educated super-users with training by the EDMS vendor, and these have taught other users and developed the needed information material."

Administrator in schooling unit: "Our super-users have trained us. The question is if they knew enough to function as trainers? Nevertheless, many of the things one must experience and figure out later. You cannot learn that on a two-day course."

Among the significant observations from the first interviews was that EDMS was selected and implemented by the CITU assisted by the external vendor with the technical expertise. It is possible to request central IT support if one knows what the issue (problem) is. CITU has not provided any follow-up or evaluation of the EDMS after the technical implementation more than a year ago. The EDMS was considered successfully technically implemented. The implementation process had left it up to the units and individual employers to adapt the system to their specific activities and uses, but with no resources provided. The organization and CITU have not allocated attention or resources to support the end-users besides specific technical errors. The monthly meetings with super users mostly addressed specific maintenance issues and test suggestions about future developments.

Besides those from top-management, several managers confirmed in the interview round that they did not feel that the organization has harvested full benefits from the EDMS. On the other side, employees confirmed that they felt left on their own and did not have the qualifications or knowledge to utilize the EDMS further. Several mentioned that the EDMS was still not used by all. The quotes below illustrate the diversity of views among employees.

Chief IT clarifies how he looks at the IT unit's role:

"The praxis is that the IT unit is responsible for the technical implementation. Now the EDMS is technically implemented, but many employees still need to understand its full set of advantages."

A senior IT manager explains that the EDMS has not been part of other changes:

"We have selected a standard-system, and we did not need to make any changes to fit the organization."

A senior administrator explains the training:

"We have educated several super-users by the (system vendor), and these have trained other employees and developed the guidelines that were needed."

Another senior administrator reflects on how to learn to use the EDMS:

"The super-users taught us. The question is if they knew enough? However, many of the things one needs to figure out by trying to use the system. You cannot learn that on a two-day course".

An IT specialist explains how much is left to the users:

"We have never made general guidelines for how each unit should use the system or how to design their' cases.' Initially, we did not think it was possible, as each user has very different types of cases."

An administrator explains how the EDMS has removed most of the paper-based case files in her unit:

"The case files have disappeared from most offices by now. If you look into offices up the hallway, you might see some employees with paper in piles that really should have been put into the system and moved to the archive."

Another administrative employee talks about problems between units:

"The central administration has moved faster with the use than some of the units outside. This gives some challenges, and I still need to use paper-based communication to some units."

Finally, an administrative employee explains the filing in the system:

"There has never been a uniform or official policy for filing the cases. This can create issues when interacting across units and when you need to identify a case in the system. Each uses her own logic. Moreover, some units have cleverly argued that they cannot use the system for various reasons. E.g., the accounting department."

The initial analysis showed that the interaction between the users and the central ITC unit is not very helpful for the local development and utilization of the EDMS. The new system and existing systems' integration are not completed in some departments; several older systems are still used in other units. Finally, several users have expressed a need for further support to utilize the new system. These observations are in line with the findings in a review of EDMS implementation in the UK, which finds a need for further organizational efforts to maximize EDMS investment outcomes (Jones 2012). Furthermore, CC senior management experience that the system's lack of utilization makes it difficult for the central administrative unit—serving the elected politicians—to provide the expected better and speedier service.

Identification and Selection of the First Two AR Sub-projects

Departing from a desire to identify and address real problematic situations (Flood 2001), a stepwise identification of topics and units with users interested in collaboration was used.

An open invitation was given to all department heads and super-users to propose issues and units willing to participate in the AR project. As all units using the EDMS had designated super-users, the invitation was considered to reach all relevant units.

Proposals and suggestions received were very heterogeneous but were collected by a deputy manager in the IT unit in a catalog open for inspection for all interested. A few more suggestions came in after the first round of submissions.

The proposals came in three types: Implementation and use of EDMS in specific units. Change of working processes made possible due to the EDMS. Improvement and change in collaboration between two or more administrative units with the EDMS.

A meeting was called for with super-users from the various administrative units, managers with responsibility for IT in the units, the EDMS steering committee, and EDMS consultants and the researchers.

The meeting spurred a debate about the AR projects' purpose and the unit's and employees' expected processes and involvement. Based on the suggestions, identifying possible projects moved into a dialogue about expectations and scopes of potential projects. This part of the process was essential, as employers' concerns and needs to be carefully considered and debated if one wants to create a safe space (Kemmis 2001). Three main comments and concerns were aired from employees: Lack of resources and time. No experienced need for development or expansion of use of EDMS. Uncertainty about the AR project and the purpose for doing it. Some of the voiced concerns is listed below:

- Why do we need these projects? Who has started it? Should top-management not be present here? (Super user (SU) from unit X).
- Can employees choose themselves, or do they need top-management support before staring? (Another SU).
- We are too busy in our unit right now to participate in the proposed project. (Employee from unit Y).
- We have so many issues with just learning to use the existing EDMS, so we need to get that fixed first. (Employee from unit Z).
- We already have an idea to improve an area that has not been working satisfactory for a while. We (Legal) would like to participate in something.

A shortlist of ten potential projects was collected from this and further debated with the project steering committee and researchers. Two potential AR projects were chosen. These represented two different challenges: One with better utilization of the EDMS through supported process analysis. Another representing the challenges in utilizing the EDMS to improve cross unit's communication and collaboration. Later, CC senior management wanted to add a third project.

The three improvement projects were located within Schools and Social Welfare Administration (Institutions for elderly and disabled, psychiatric institutions), Healthcare, and the Accounting Department in the central administration. Thus, each project represents different communities of practice with their own thought-world. The sample was homogeneous (Van de Ven 2007) as all units belonged to the same organization yet heterogeneous as their tasks differed and concerning how the departments considered their situation concerning the utilization of the EDMS.

The Three Sub-projects

First Project: Institutions

Phase 1: Problem identification: The employees in the administration of institutions were very positive already when the opportunity for an AR project was aired. They had identified several areas before the first workshop. To support problem and solution identification, nine interviews were conducted: two from the institution's administrations and seven from the central administration, comprising legal staff, psychologists, and administrators. After the initial interviews and discussions, the institution's task of formally reporting to the central administration on physical restraint was selected. Some of the institutions that this office administers are allowed, in exceptional circumstances, to use physical restraint to control patients. The number of cases was low compared to other incidents that must be reported (e.g., critical incidents in daily care or employee accidents). The employees involved in the administration and reporting found that a speedier, electronic, and transparent process would be more favorable than the existing paper-based processes. Adding to the issue was that politicians had, from time to time, asked for faster and more transparent reporting. Employees thought that a complete electronic case handling starting at the institutions and then centrally filed would be beneficial in several ways. The existing paper-based system did not allow for full tracking or quality control. Reporting to the political level would be faster and allow quicker follow-up than the current yearly computation, which did not provide many details.

Phase 2: Solution identification: The first project's intervention process took eight months, rather than the six months planned. The first workshop started with documented and listed issues on flipcharts, but participants quickly agreed to move to an initial workflow analysis of existing processes. The workflow analysis was used to draw process diagrams as input for the following second workshop. That included brainstorming, sharing of visions, and solution generation and selection. Several solutions were identified. After the second workshop, the steering committee was involved, as the implementation of the chosen solution required the assistance of IT specialists. Later two workshops with the EDMS provider and two IT specialists worked with the users' suggestions to transform them into descriptions given to IT specialists. This process involved three employees from the involved units and the researchers.

Phase 3: Solution implementation. Approximately five months after starting, the modified system and processes were tested and were integrated into the EDMS. Researchers conducted five follow-up interviews with employees. Among the significant outcomes from the first project was a redesigned and implemented electronic workflow. The direct effect was faster processing of cases, improved data quality, and improved legal rights for institutional residents. Two other organizational units and even another county became interested in the new solution and later copied it into their systems and practices.

Second project: Healthcare Administration

1 Problem identification: The first project's format was repeated to establish communicative space in the second project: Nine interviews was conducted with employees from the main hospital before the workshop. The interview round revealed no less than six potential ideas. In the project steering committee CC management pointed to one particular interest area: improving the administration and processes among the five hospitals and the central administration. A new management model was being implemented, requiring all the CC hospitals to act as one hospital and coordinate their activities, working as a multisite hospital (Ahgren 2008). The communication between the units and the central CC was nearly 100% paper-based or based on attachments to e-mails. The CC management would like to explore if the EDMS could facilitate a faster exchange and sharing of information.

Nine employees were invited, and seven participated in the first workshop. Those were from administration at the biggest hospital, the healthcare-assurance administration, the planning unit, and several hospital administrators. The first workshop started with an invitation to brainstorming and idea-production, to be mapped on flipcharts and prioritized. Uncertainty prevailed. Participants asked to clarify the intentions with the EDMS's and the AR project's role. They had not yet realized that they could by themselves select issues they wanted to be addressed. Several employees also revealed that they still did not trust the EDMS and did keep paper copies of "important data." Other employees air concerns about using the system's search function, while others report no uniform way to classify data within the healthcare administration. "I do not trust putting anything important into the system. I will always store it in our database first," said one hospital administrator. The organization of cases in the system was reported as being confusing to nearly everybody involved. The filing was based on individual taste and decisions. Each user had created their own classifications and personal structure. The system was not used to support interpersonal or inter-organizational workflows. An example screen dump from the one user of the EDMS is shown in Fig. 4 below, which shows the personal way this user has chosen to classify the cases.

Phase 2: Solution identification:

The second workshop was planned to debate potential solutions. Instead, a general discussion on the use of the EDMS continued among the participants. Mostly about who should decide about using the system and how to structure and classify cases became mixed with staff members' concerns about transparency and the potential loss of "freedom to decide" of hospital employees. The administrators had already created their own classification systems within the EDMS and did not recognize any need for changing this. A smoother or faster communication between units was not the primary concern of hospital employees now. Hence, discussions at the second workshop did not produce any shared vision or ideas about more specific improvement areas. A working group had two subsequent meetings over the next two months, but that just repeated most of the discussions, and none of the participants showed interest in pointing to solutions.

Phase 3: Solution implementation.

- Recreational center in X City
- Nephrology
- Personnel planning for clinical biochemistry
- Continuing education for managers and doctors
- Home hemodialysis
- Newsletters from union representatives
- Fire inspection at X Hospital
- Telemedicine
- Workshop on treatment planning for heavy-ion radiotherapy
- Strategy paper for hospital
- Issues for the next management meeting
- Application for funding of seminar
- Allergic Asthma Conference
- Vacation planning
- Structure for doctors staffing
- Heart area
- Center meetings
- Psoriasis
- Changes in the managerial structure
- … (and so on)

Fig. 4 Example of entries used in the EDMS by an employee in healthcare administation

The outcome from these interventions was a report that outlined the implementation processes, the unclear objectives, the current administrative flow, and suggestions for improving the EDMS use, including on-the-job training, expert users, and collaborative efforts. The report was presented to the steering committee and CC top management.

Third Project: The Accounting Department

The CC top management team suggested the Accounting Department for participation as the last unit. Researchers agreed to undertake the project focusing on identifying improvement of EDMS use within the unit. This different point of departure should prove to be significant, as the analysis will reveal.

Phase 1: Problem identification:

Three subunits in the accounting department were involved: Management accounting, budgeting, and IT services. Identical to the first two AR projects, a round of diagnostic and problem-identification interviews was undertaken. Eleven employees were identified as potential, and five were interviewed for problem identification. The issues that surfaced were centered around a limited use of the EDMS in the department, a lack of confidence that the EDMS could be used for their specific purposes, which often involved calculations and budget preparation. A few voiced an interest in exploring if the EDMS could facilitate smoother communication with other units. Others raised concerns over a lack of knowledge about the system, and that ongoing implementation of a new accounting system required their full attention.

The use of the EDMS in the Accounting Department was described as highly individualistic, as employees used it as a convenient way to file their own documents. Several employees explicitly challenged the concept of 'cases.' They believed that cases had no relevance to their work with budgets and calculations, which, they said, followed different processes than those supported by the EDMS. Furthermore, the department manager openly expressed his lack of support for the project.

Phase 2: Solution identification:

It was agreed that a process like that of the first two projects should be used, starting with two workshops for selected employees. Of the eighteen employees in the Accounting Department, eleven were identified as potential workshop participants, and these were all invited to the first workshop. Surprisingly to the researchers the first workshop was canceled due to implementation activities for the new accounting system. Subsequently, seven employees were invited to another workshop; six employees attended, and one sent an excuse. During the workshop introduction, one employee received a telephone call about the accounting system and left. He returned shortly and asked two others to come to assist with the system. With only three employees left, we decided that it did not make sense to continue. A third workshop was arranged some weeks later, but all those invited later canceled for various reasons.

Phase 3: Solution implementation.

A short report was drafted and discussed by the steering committee and processed to CC top management. This last project officially ended without any solution identification.

The next section will discuss the observations and reflections on the three projects.

Discussion

On an empirical - practical level - it was surprising for the researchers to learn when conducting the projects - that when moving away from central administration - the EDMS - was both perceived very differently. It seems to be more of a technical implementation than an organizational one in the CC case here. In that process, the intended users have not been directly addressed in the process but marginalized (Lyytinen and Newman 2015), and the task left over to the super-users. Table 3 below here provides an overview of the three projects.

A cross-case comparison can help identify learning points based on preset criteria (Iversen et al. 2004). A summary of the first analysis is provided in Table 4 below here using the analytical questions suggested by Iversen et al. (2004).

The experience with using IT and especially the EDMS was highest in the Institutions unit, while the healthcare unit had a very individualistic attitude towards the EDMS. It was used as a personal filing system for single administrators. The accounting department focused on their spreadsheets and budgeting systems that were saved on department servers.

The attitude towards the EDMS differed between the units. The super-user from the Institution's administration came to the first meeting about the AR project with several suggestions for improvement by using the EDMS and supported by the unit manager's attitude.

Table 3 Summary of the three projects

	First project	Second project	Third project
Where?	Institutions (Schools and Social Administration unit)	Planning (Healthcare at Hospital)	Auditing and Accounting Department (Central administration)
What?	To improve document workflow for reporting the use of physical force in restraining persons.	To improve the exchange of information between hospitals and the central administration.	Identification of potential areas for improvement using EDMS
Why?	Volunteered	Volunteered	The unit was selected by top management.
Employees involved	14	9	11 (6 attended one workshop)
Length of interaction	Eight months (+ follow up interviews after 9 and 14 months)	Eight months (+ report debate 1 and 2 months later)	Six months

Table 4 Cross-case comparison of the three projects

	First project: Institutions administration	Second project: Healthcare administration	Third project: Accounting Department
Experience with IT use	Some	Some, but individualistic culture.	High, but focused on calculations
Attitude toward the EDMS	Curious	Curious - interested - and then not	"We do not need it."
Unit manager's attitude toward improvement project	Positive	Interested and positive	Negative
Employee attitude toward improvement project	Positive	Curious - Somewhat positive - then negative	Negative and busy doing other things
Possible to make a mapping of existing processes?	Yes	To some extent	No
Does the initial stage lead to a shared understanding of potential objectives among employees?	Yes	Somewhat	No
A shared vision for improvement?	Yes	No	No
Possible to identify solution(s) that includes the whole unit?	Yes	No	No
Possible to run the intervention process through the planned stages?	Yes	Only partly (mapping partial, some problem identification, but no selection or shared visions)	Not even a first workshop
Outcome: Intervention produces improved utilization of the system?	Yes	No	No

The healthcare unit was curious and interested to know more, but the participants with managerial responsivities seemed to lose interest in the project during the process. At the same time, at CC, senior management required that this sub-project consider EDMS a technology for cross-unit communication. This would have implied a need for mutual adaption, and this was not asked for. The third sub-project in the Accounting department became a failure as the department head was outright negative to participate in the sub-project.

Institutions Administration had a manager with a positive attitude toward the project, and employees were engaged in the project. This made it possible to run a full intervention process, as Argyris and Schön (1978) suggested. It was not possible to exploit the initial high potential of the Accounting Department to produce a positive outcome because, for reasons unknown to the AR researchers, the department manager was reluctant to undertake any change, preferring to keep his unit separated from other departments, and even to the CC's top management. This behavior reinforces silo thinking with separation between units and prevents outside threats and potential embarrassment (Dick 2019).

The Healthcare project never managed to get the process to move beyond the identification of challenges, as participants defended a robust independent culture, which did not recognize any need for the sharing of information. Thus, domain skills and experience are no guarantee for creating a fruitful communicative space if a strong community feeling prevents a productive dialogue from emerging through perspective-taking (Tsoukas 2009). The notion of reluctant users in IT research is diagnosed due to a fear of change and loss aversion or some psychological commitment to prior solutions and ways of working (Kim and Kankanhalli 2009). Excuses, explanations, distortions, inexactitudes, omissions and uncertainty about objectives are common strategies to be used to keep what one has. Skilled incompetence is the use of such strategies based on theories of action aimed at avoiding loss of face (Probst and Büchel 1997).

Also, the healthcare unit's initial positive attitude did not help the process move on into any commitments. The healthcare employees refused the need for better filing systems and improved cross-organizational coordination. This behavior represents one of the difficulties in healthcare mergers: professionals show opposition and doubt about organizational mergers' usefulness (Ahgren 2008). The healthcare subproject especially gives insight into a much debated and critical issue in EDMS: How to keep records and who is doing it? (Joseph et al. 2012). Although there exist guidelines and certified standards on this, these standards are subject to local interpretations and adaptions and might challenge existing roles and interpretations (Joseph et al. 2012). The "ISO 15489 Records management - Principles and concepts" (ISO 15489 2020) set up the core concepts and principles for creating, capturing, and managing records. The standard was updated in 2016 after the first version came out in 2001. The sensemaking of standards is critical in EDMS implementation and use (McLeod and Childs 2013; Pan 2017). The researchers brought this issue to the attention of the steering committee and know that CC has later addressed this in a cross-organizational development activity.

Both the second and third AR subproject encountered reluctant users and user communities who focused on their own needs and perceptions rather than on the whole organization's shared interest, representing what has been called a pragmatic dilemma in AR (Holgersson and Melin 2015). Different units within the CC have various stakeholders who do not share the same goals as senior management. Holgersson and Melin (2015) refer to Rapoport's observations that what was initially suggested to be the problem is not really the problem (Rapoport 1970). In the present situation, the original problem of underutilization of the EDMS is the problem. Nevertheless, locally anchored defensive routines make it exceedingly difficult to address broader EDMS issues for the researchers. This was

surprising for the researchers. We were not prepared to tackle the defensiveness of using the EDMS in inter-organizational communication and collaboration between the CC units, although defensiveness is to be expected (Dick 2019). Argyris and Schön widely discuss it in their research (1978, 1996), with which we were familiar before the project. Being thrown into the explicitly living embodiment of defensiveness was different from reading about it. The researchers experienced how defensiveness is a natural response, especially from weak relationships (Dick 2019). Besides, the project would have needed more time to deal with these issues. Time pressure in AR projects represent a conflicting demand and distract the collaborative processes (Jacobs 2010). More time would have made it possible to explore the contextual and strategic agenda around EDMS. EDMS research has found that a significant issue often is that the technology's strategic ambitions are not formulated and communicated (Alshibly et al. 2016; McLeod 2012) as the AR project here also found. Unlike the Holgersson and Melin case situation, senior management in CC was highly interested in the reflections and reports they received. Still, subsequent follow-up actions were beyond the scope of this AR project. Still, the researchers believe that the surfacing and explication of these issues make it possible for CC to openly address them in the future (Dick 2019: 156).

Regardless of openly expressed top management support and two units that volunteered to participate, it was only possible to establish a double-loop learning process in one of the three projects. Moreover, with quite some investments in resources, time, and efforts, one could add. In the Social Administration project, the AR process created an adequate level of trust and handled the defensive routines that surfaced. That AR sub-project demonstrated the possibility of generating transparency in every step of the administrative case processing. The dialogue produced an improved understanding of the options with the EDMS system. The group conversation was "able to activate a collective creation of a new reality" in the form of specific suggestions (Everri et al. 2015: 299). It was supported by collaboration with employees from the central administration, the IT department, and the IT system vendor. Double-loop learning was achieved, and all three needed preconditions were in place: It was possible to establish a foundation for an informed conversation about issues and solutions, employees participated in free debate, and they agreed on the changes (Argyris and Schön 1978).

The two other AR projects and the attempt to create communicative spaces did not produce any pearl-learning opportunities or lead to transformative learning, as others have reported (Eady et al. 2015, p. 3). In the Healthcare project, regardless of an initial agreement that the current administrative processes were cumbersome, the employees later successfully defended the need for using EDMS in distinctive and highly individualistic ways, leaving no room for other interpretations or new suggestions, and rejecting alternative interpretations from the facilitators (Wicks and Reason 2009). The participants defended their lifeworld (Wicks and Reason 2009) of the individual employee and the individual hospital units by claiming their rights to their individualistic use of the EDMS. Their understanding of what constitutes practice (Nicolini et al. 2003) did not include the recently introduced vision of a multi-sited hospital (Ahgren 2008). The employees successfully defended their worldviews and not buying into the senior management vision of a better IT facilitated integration and communication. The invitation to the communicative spaces did only partly divert the understanding from repeating a defensive rationalization and only the first AR project succeed in changing from defensive sensemaking into a learning mode (Klemsdal 2013).

Even if the espoused theory (Argyris 1990) from top management and those involved was that "we want and need to use the system," the theories in action in the healthcare

project were: "We do not trust the system, ""We do not like the system" or "I know how to use the system the best way for me." The ideas and suggestions produced at the first workshop did not evoke suggestions or a shared feeling of a need for change. The third project demonstrated that top management support is not enough to effect change if the power base (Cavaye and Christiansen 1996) is substantial. One observation was that the employees did not want to discuss the undiscussable (Argyris 1990), leaving AR researchers alone in the meeting rooms. These strong defensive routines meant that no individual or organizational learning of EDMS was facilitated in Accounting. Table 5 below summarizes the three projects concerning the outcome, the level of trust created, and the defensive routines.

Individuals do not change easily (Argyris 1999), as change involves learning and the recognition that everything is not perfect – that something can be improved. Argyris argues that individuals and organizations try to conceal the need for change to avoid embarrassment, threat, or negative surprises, and they prevent the identification of the causes of these problems (Argyris 1999: 141). Argyris distinguished between two types of defensive behaviors (Argyris 1990): skilled incompetence and organizational defensive routines. Skilled incompetence refers to individual actions, behaviors, and taken-for-granted assumptions that make it possible to fail to recognize problems, thereby upsetting others and saving face. They are based on deeply grounded beliefs that do not reach the surface of consciousness. Organizational defensive routines have the same objectives: to avoid embarrassment or to avoid upsetting others, to cover up problems, and to prevent having to deal with the causes of problems (Argyris 1990: 25):

> *"Organizational defensive routines are actions or policies that prevent individuals from experiencing embarrassment or threat. Simultaneously, they prevent people from identifying and getting rid of the causes of potential embarrassment or threat. Organizational defensive routines are antilearning, overprotective, and self-sealing."*

According to Argyris, if employees fear embarrassment, loss of face, or reputation loss because of expressions and statements that surface, they will not participate or will be only superficially involved (Argyris 1999). In the second and third projects, the defensive routines can be explained by some of the inner contradictions that exist in management (Argyris 1999: 152–156). To undertake their tasks, employees develop routines that are internalized over time and become tacit even to themselves. Such routines help employees carry out their tasks without questioning or reflecting (single-loop learning), while the current AR approach made outsiders ask questions on present behavior. Furthermore, Argyris states that "[p]rofessionals embody the learning dilemma: they are enthusiastic about continuous improvement – and often the biggest obstacle to its success" and adds: "The professionals began to feel embarrassed. They were threatened by the prospect of critically examining their role in the organization" (Argyris 1991: 7). The creation of communicative spaces facilitated an open dialogue in one of the projects. Institutionalized practices prevented change (Azad and Faraj 2009) in the healthcare project, and employees refused (or found excuses not) to participate in the last AR project.

Comparing with the large-scale cross-cultural systems development project reported by Rose and Saifullah (2012), the present experiment only induces a successful change in one of the three subprojects. The micro-level of analyses in the present AR allows for a deeper understanding of some of the change projects' mechanisms. The employees in two of the projects did not agree that the information presented was valid; they did not want to face the issues beyond a single-loop learning mode; neither did they agree on the need for change; hence the requirement for successful double-loop learning is not meet (Argyris and Schön 1974). Strong defensive routines crippled the process, making it undiscussable to discuss

Table 5 Outcomes and processes of the three AR projects in a learning perspective

	First project: Social Administration	Second project: Healthcare Administration	Third project: Accounting Department
Outcome	A successful double-loop learning process	Participants wanted only single-loop learning	No learning
Trust	A high level of mutual trust is established and enables the search for solutions	Employees had a low level of trust in the EDMS	Low level of trust toward the researchers and top management
Robustness of defensive routines	Defensive routines are possible to discuss. Dialogue leads to new interpretations and a shared vision.	Strong individual defensive routines. No dialogue across units, but statements.	Strong defensive routines promoted by the department manager. No dialogue.

the undiscussable. The use of the existing procedures was so firmly rooted in daily practices (Orlikowski and Robey 1991; Argyris 1999) and institutionalized black boxes (Azad and Faraj 2009) that employees could not envision any alternatives, and even explicit top management support could not change that. The exiting concept of what constitutes their 'production' (Jalonen et al. 2016) and who is in charge of it is strong in accounting and the hospital administration. Strong epistemic cultures (Cetina 2009) in both places are refusing any alternative interpretations to be discussed. Following the observations from Eady et al. (2015: 112) about useful detachments in search for stimulating learning and Tsoukas (2009) observation that productive conversations can only lead to new insights if participants can engage in perspectives of others. The communicative space might have become established and facilitate reflection if employees have not been so strongly connected to their own communities of practice (Lave and Wenger 1991) rather than the overall CC. This points to an interesting limitation with the use of communicative space, as it depends on the ability to include an outside view on issues. One learning from the Rose and Saifullah (2012) cross-cultural study is that it can be beneficial to apply an outside view on the situation to get a broader perspective. This might be able to facilitate the much-needed broader perspective-taking on issues (Tsoukas 2009).

The experiment with AR was based on the assumption of productive and unproblematic collaboration between various units within the CC which might have been supported by the assumed Scandinavian management style (Schramm-Nielsen et al. 2004). This management style is assumed to be based on an informal, flat organization with inclusion and a collaborative culture (Strand and Skogseid 2013). This is a generalization, that might not prove to cover all organizations and situations, as Strand and Skogseid (2013) also finds in their study.

A critical reflection that emerged after the project is the issue of problem owners. Establishing an AR project might best be described as the outcome of several streams coupled by timing rather than consequential analysis and, therefore, with a great deal of ambiguity (March and Olsen 1976). The different group might have their own agendas, and the AR project is a fragile construction as established AR groups are fluid (Kemmis 2001) and open systems, reflecting other organizational issues. Much research on critical factors in implementation stresses that top-management support is critical (Arvidsson et al. 2014; Sarantis et al. 2010), but what does top-management support connote? Can top-management 'decide' to remove internal conflicts and different perceptions within various communities of practice?

The concept of communicative spaces (Kemmis 2001) and its challenges have been discussed before (Wicks and Reason 2009), but further research is needed to be conclusive on the use of the concept and what facilitates successful outcomes. The three suggested phases in creating the communicative space: inclusion, control, and intimacy (Wicks and Reason 2009) were successful in the first project. In the healthcare project, the participants seem to use the inclusion phase to reinforce the strong individualistic culture. As the group united in agreeing on this, refusing to produce alternatives to existing practices, one can wonder if more time and dialogue, questioning why they were interested in joining the AR project, might have changed things? The last project's employees' refusal to even engage in debate, banning meetings, or leaving them became a frustrating learning experience for the AR researchers.

Low-level interventions (Jönsson 1992) and creating communicative spaces such as dialogue, scenario techniques, and workshops (Brits 2015) can facilitate explorative behavior and organizational learning (March and Olsen 1976). Nevertheless, limitations are apparent. Such spaces are not immune to low mutual trust, defensive routines, local subcultures,

and organization politics. Other studies in the public sector have shown that mutual trust and communicative spaces can facilitate learning and changes (Eady et al. 2015) and that AR can facilitate the development of professional practices on the group (Paltved et al. 2016; Iversen et al. 2004) or individual level (Mårtensson and Lee 2004). This prior research do not report on organizational conflicts or power issues related to external relations. We find that this issue might be underdeveloped within research dealing with IT and organizational change (Robey et al. 2000) and on E-Government (Dwivedi et al. 2009).

Since the focus in the current AR project was on trying to facilitate learning within the subprojects, one area for further improvement could have been on a more in-depth analysis of how to share the reflections across the organization, e.g., by using a broader range of knowledge sharing tools like proposed by Massingham (2015). He tested ten different knowledge-sharing methods and found that some were successful while others failed mainly because of contextual factors. This finding seems to substantiate that in AR projects, the context's role can't be on the methods themselves but the interplay between in the specific context. Massingham also concludes that facilitation of reflection and knowledge sharing is inherently tricky, which was also found in the current AR project.

In terms of governance, this study shows that IT utilization is much more than a matter of diffusion (Korteland and Bekkers 2008; Rogers 2003) or having the right plans, objectives, and resources (Rose and Grant 2010; Sarantis et al. 2011). The use of AR projects makes it possible to adapt IT to new objectives missed in the original design or discovered during the process (March and Olsen 1976), thus adapting both the technology and the organization to new goals, but it is not an easy or quick fix. In the healthcare AR case here, employees only refused to draw conclusions or act, but with no opposition to engage in the conversation, the workshops and meetings on the possible extended use of the EDMS. It can be debated if it is too simplistic to describe this as resistance (Kim and Kankanhalli 2009) as the situation shares some traits with involuntary non-use (Andersen 2016). Involuntary non-use is described by Andersen as a situation when one wants to use new ICT but cannot because of lack of knowledge but not because of perceived threats. When the situation cannot be described as involuntary non-use, it is because, from the first interviews and workshop, the question about the right of the healthcare professionals to make their own decisions was raised several times. .

One reflection on the outcome of the second subproject within healthcare in CC is that the project stimulated the medical staff and administrators' interest. However, their commitment to pursue a broader exploration of EDMS use proved to be limited, and they refused to draw any conclusions on actions to be taken. To engage in improved internal communication across the CC and sharing of documents may challenge the autonomy of the healthcare professionals and the positions of the different stakeholder groups as others have found (Rosmulder et al. 2011). The observations in the present AR also confirm Rosmulder et al.'s findings that the healthcare professionals were engaged in the AR project but then opted out when actions needed to be taken (Rosmulder et al.: 399). This lack of action orientation came as a surprise to the researchers in the current project. It would have required a unique process to deal with this issue, and our agreement with the CC did not include such an option.

Another reflection on this is that the present EDMS is not having a major interest in the hospital, as other research has found that Electronic Medical Records (EMR) is of major interest to the professional medical staff (Top et al. 2013). Our workshops and reflective teams' meetings could not change the status of EDMS versus EMR, as the agenda about improvement of cross-unit communication was of minor interest in the hospitals. The structural barriers could not be overcome. One area where the AR project could have been

expanded was a deeper analysis of the organizations' systemic problems, e.g., by mapping stakeholders and the system of views and conflicts between these (Raza et al. 2019). This would have been useful in the understanding of some of the processes that later emerged.

As for the question about the usefulness of communicative spaces in this process, we have shown that it is a useful concept to frame the needed 'safe space, but we need to little about the conditions. If successfully established, it becomes an agora, a public space where meetings and exchanges of views can occur. Observations here indicate that intentions to create such a space is not enough if the vision for the AR is not shared among participants, and the conversations do not become productive (Tsoukas 2009). Employing intelligent techniques for investigation and surface scanning for issues and problems does not guarantee that the involved employers share the same vision or problem. As Tsoukas points out, a productive dialogue requires that participants apply another perspective than their own at stake (Tsoukas 2009). The present paper's contribution is to explain how defensive routines can hinder a productive conversation from happening, so participants do not engage in a shared solution search. Finally, the processes of communication in AR projects presented here indicates that the 'users' can become part of the active development of IT (Lamb et al. 2003) while the IT professionals in the case organization are inclined to their identities as experts rather than as reflective practitioners (Schön 1996: 290–310) as they only engage with the users' issues after the AR interventions. Further research should investigate how AR can facilitate conversations in such situations.

One meta-reflection from the study is that EDMS, like other technologies, needs to be confirmed continuously, and some explain this as the effect of routinization (Cataldo et al. 2018). By this, the employees have incorporated it into their daily life. The assumption about stability is questionable. Organizations are often not stable, having conflicts, continually experiences changes, and are subject to negotiations and translations, a more substantial interpretation could be that technologies need to get connections and allies (Callon 1986). These relationships need to be continuously re-negotiated and cannot' be taken for granted and are fragile being challenged by other solutions (technologies) (Latour 1987). The idea of an implementation that is, if successful, becomes stable, when and if, the technology is accepted, is thus challenged in this view.

Conclusions

Highhouse (2009: 3) formulates one challenge of learning from an AR experiments as the present one with this statement." [T]he ability to generalize from one situation to another requires an understanding of underlying principles and recognizing which principles apply in which situations". Initially the researchers here where inspired by the notion of "situated experiments" as presented by Greenberg and Tomlinson (2004). A situated experiment is broadly speaking a laboratory experiment moved into a natural setting making it possible to combine the best of both worlds. Doing an experiment but in a natural setting. After the three experiments in the three subprojects here we must conclude that there are too many variables that differ between the experiments. For example, the last unit did not take part voluntarily. The second AR project involved hospitals units undergoing a merger process. Therefore, we are cautious about making to strong conclusions from the experiments with the communicative spaces here.

Critically reflecting on the outcome of the three AR projects, it seems that the AR project's ambitions were bigger than the resources, knowledge, and time allocated and needed

for a successful process. The agreed agenda with the senior management and the steering committee was, in hindsight, too optimistic about the state of use of the EDMS. The interviews and workshops in the three subprojects all demonstrated to the researchers that EDMS was used for mundane administrative tasks within units. Such as filing cases and documents within specialized areas and units but not beyond that. This was not explicitly addressed in CC before the AR project reported here. Therefore, the problematization used for the AR was both realistic but also ambitious.

The use of communicative spaces can be a useful approach to facilitate transformative learning and lead to organizational changes. The present study shows that the application of communicative spaces can be productive for knowledge generation in an AR project. Two AR projects successfully used the communicative space to facilitate a dialogue about current workflows and practices. Surprisingly, only in only one out of three projects, communicative spaces could facilitate a transformative learning process. When potential – suggested – transformations challenged existing practices and world views that might infringe existing independence, two units opted out of the AR project. The defensive routines were more robust than the desire to change.

As an example of an organizational experiment to improve IT use in a public sector organization, the project demonstrates that plans, objectives, and visions are not enough to secure success. It also shows that some unexploited opportunities could make both public and private organizations reconsider if they have untapped potentials in utilizing their existing IT. Further studies in this area should increase our understanding of the complexities of improving IT utilization in the public sector beyond diffusion studies.

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Compliance with Ethical Standards

Conflicts of Interest/Competing Interests Not applicable.

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