

# INNOVATION IN THE PUBLIC SECTOR USING IN-HOUSE COMPETENCE IN ENTERPRISE MODELLING

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## Abstract

*In this paper we present preliminary results from a project concerning the use of enterprise modelling (EM) to improve innovation in the public sector in Norway and Sweden. During the project employees from participating organizations got the competence to model their organization, including goals and business processes, thereby trying to capture the essence of the practices that only they know well. The research is an exploratory case study, and we found the approach promising for service and process innovation. Enterprise modelling done by employees builds competence and may be a fruitful way to make successful innovation projects turn into an organizational capability.*

Keywords: Innovation, public sector, enterprise modelling

## 1. INTRODUCTION

Information and communication technologies (IT) is considered a major driver for the innovation that is regarded a key element to solve major challenges in the public sector in Norway and many countries (NOU 2011:11, Stortingsmelding 2008-2009, 2012-2013).

The use of IT to drive innovation is no guarantee for success. There are numerous examples of failed projects, and many of the failures can, at least partly, be attributed to overly emphasis on technology and too little concern with the challenges of planning and implementing the necessary changes in the organizations (DND 2014, Bygstad and Lanestedt 2014).

An important part of the future for the public sector is transformation by Digitization, which includes concepts like digital services, digital first choice, and digital information handling (Regjeringen 2012). We understand the changes caused by digitization mainly as a matter of innovation in services, processes and technology. Digitization comes with expected changes on a large scale that is beyond normal organizational development and must be handled by innovation processes.

Innovation in the public sector is to a large extent “organizational innovation”, which refers to the adoption of an idea or behaviour new to the organization (Lam 2005). We have thus chosen to use the following definition of innovation: “*Innovation is adoption of new practice in a community*” (Denning and Dunham 2010). This definition gives less attention to technology inventions and lets the processes of adoption of new practice come to the center of attention.

Practice can be captured by business processes as they model the work that is done to deliver a service or a product as groups of activities (Hammer 2010). As such, business processes exist whether or not they are explicitly used or documented. If they are not documented, they remain tacit in the sense that they have no names and are not explicitly a target for management. They exist as practice and knowledge, and are distributed in each employee’s perception of work. The execution of business processes is therefore deeply rooted in daily practices (Denning and Dunham 2010).

Business processes are important parts of broader enterprise models that also include organizational context, goals, information flow and collaboration models (Eriksson and Penker 2000, Ellingsen, Fallmyr, and Mathisen 2008).

Established methods for Business Process Management and Enterprise Architecture represent approaches where, in many cases, external consultants use their specific methods to assist to document processes, define management approaches and link the business processes to IT systems and company-wide IT architectures. There are many frameworks for this that are widely used and apply "best practice", for instance The Open Group's Architecture Framework, TOGAF (Open-Group 2011).

The frameworks may be considered management-oriented tools that typically prescribe a top-down approach to planning and implementation. They are not, however, generally embraced by management, and are considered difficult to implement. Their contribution to the expected benefits from projects concerning organization and technology changes is debated (Trkman 2010, DongBack and La Paz 2008).

Sørensen and Torfing (2011) argue that "*innovation is always driven by social and political actors who are facing specific problems and demands and choose to exploit particular opportunities*". Considering the sources and drivers of innovation in the public sector as described by Sørensen and Torfing (2011), there will be many short-term considerations that will gain priority over more long-term considerations. We seek alternatives to the top-down planning based and long-term approaches, and explore a change concerning the practice of innovation that is much more aware of the competencies among managers and employees that are important to succeed in the adoption of new practice.

Innovation in services and processes in the public sector do depend on IT-based services so competence about how IT and organization can be understood and treated together, both among management and in the organization at large, is of great importance for the management of innovation capability (Kharabe, Lyytinen, and Grover 2013, Zammuto 2007).

Despite the shortcomings of the business-oriented framework approach, features from them can be used to hold a holistic view of organization and IT and build capabilities, not just solve immediate problems (Ross, Weill, and Robertson 2006). Organizations, also in the Nordic public sector tend to be grown and not architected (Bloomberg 2013). Therefore, a bottom-up approach that would include the employees who actually work in the processes was interesting for this project.

In this paper we present preliminary results from the BitStream project ([bitsteamproject.org](http://bitsteamproject.org)) where innovation work in public organizations was based on developing and using local competence in enterprise modelling. The modelling is done by those who work in the processes and really know them, and is used to enhance common understanding and problem solving abilities between groups of people in the organization.

The research is an exploratory case study, and our research question is: *how can enterprise modelling based on employee competence support public sector innovation.*

In the rest of the article we first briefly review related research and our theoretical approach on innovation in the public sector, as well as enterprise modelling. In section 3 we describe our research method. We present our findings in section 4, discuss them in section 5, and conclude in the last section.

## **2. RESEARCH REVIEW**

### **2.1 Innovation**

The Norwegian Research Council defines innovation as follows (translated):

*"Innovations are new or significantly improved products, services, processes, organizational structures or marketing models that are used to create value and / or social benefit".*

The concept of innovation has focused on new products related to economic benefit (Schumpeter, 1934) but the view has also expanded towards conceptualizations regarding configuration of work

practices, i.e. business processes (Price, Boud, and Scheeres 2012). Innovation need not be connected to economic value (Fagerberg 2005, Iden, Andestad, and Grung-Olsen 2013).

Sørensen and Torfing (2011) address innovation in the public sector and focus on the process that leads to the outcome, and define innovation as an *"intentional and proactive process that involves the generation and practical adoption and spread of new and creative ideas, which aim to produce a qualitative change in a specific context"*. In the definitions above the crux of the innovation lies in its usefulness. It must be taken into use and thereby replace old practice.

In order to turn an idea or an invention into an innovation, the innovator will face the challenges of replacing old practices, and must combine several different types of knowledge, capabilities, skills and resources (Fagerberg 2005). Innovation, in this perspective, may therefore be seen as a broad range of actions and deliverables that are embedded in the daily work activities, including job enactment and social processes in the organization.

When studying innovation in the public sector, it seems useful to give more attention to innovation as a change of practice and give less focus to technological inventions. We will therefore use the definition of innovation by Denning and Dunham (2010): *"Innovation is adoption of new practice in a community."*

Success in innovation is highly dependent on characteristics of the organization and how it can serve as an arena for innovation processes. Among the important success factors for innovation in public sector we also find leadership, employeeship (a mindset of partnership and responsibility), good organizing of innovation, and visibility (Vinnova 2011).

## **2.2 Service innovation and employee-based innovation**

In the public sector, innovation through digitization will center on new digital services, changes of work to deliver those services – the process changes – and the technology as enabler and tool.

Service innovation is quite different from product innovation in that it does not depend so much from R&D efforts. Everyday organizational practices and employee knowledge play major roles as services are direct results of the business processes that deliver them and employees carry out the acts that constitute the service "product". Employee-driven innovation appears particularly important for services (Sundbo and Toivonen 2012).

Since services are so closely related to the business processes that deliver them, service innovation requires particular attention to innovation of the business processes and hence the adoption of change of practice. Our definition of innovation also emphasizes that emergence is an essence of innovation (Denning and Dunham 2010). The success of service and business process innovation seem to benefit from a bottom-up approach (Sundbo and Toivonen 2012).

## **2.3 Innovation and agility**

Research on organizational agility has argued in favour of strengthening of IS-Business relationships by higher competence in order to increase capabilities that are important for the ability to change, such as digital options which positively affect higher levels of organizational agility (Sambamurthy, Bharadwaj, and Grover 2003, Kharabe, Lyytinen, and Grover 2013).

Although these results are on a strategic level, strategies need implementation and change of practice in order yield the expected to benefits organizations. As such, being agile and being innovative both require change of practice. The research addressing strategic level issues therefore provide some significant firm-level properties that are areas of concern when working with the capabilities to change practice. They give clues as to which organizational capabilities management should focus on in order to develop lasting capabilities to innovate.

The results are important since it may be the case that most public innovations are episodic and driven by accidental events that do not leave public organizations with a lasting capacity to innovate (Sørensen and Torfing 2011). This means that a lasting ability implement the changes required by innovation and agility depends on competence that can improve maturity level and success rate.

Empowered and qualified employees may be a dynamic capability, albeit one of those intangible ones (Høyrup 2012).

## 2.4 Enterprise Modelling

Enterprise modelling is often used in conjunction of with BPM to make a Business Architecture (Harmon 2014). We apply the term enterprise modelling as an approach to document important aspects of an organization or a function within an organization, typically its context and stakeholders, important concepts, goals at high and lower levels, business processes and collaboration patterns (Eriksson and Penker 2000).

We focus on simple graphical models communicate well and that be developed by employees, thereby supporting a bottom-up approach. Although some of these models could be enhanced and detailed to specify requirements for IT solutions in much the same way as software developers would do, that is not our intent. Our models are intended to communicate understanding of a problem among different actors and support analysis and planning on management and employee levels (McCormack and Rauseo 2005).

In contrast to the view that *"Business process systematization maybe undertaken either by agencies directly or by outsourced contractors on their behalf"* (Dunleavy et al. 2006), we investigate whether a broader part of the organization should be engaged in developing and implementing process and service innovations in order to yield a higher success rate.

If employees are trained in enterprise modelling, they are not just left to "find their way" to improve processes and services (Price, Boud, and Scheeres 2012), but they may acquire the necessary competence to be deeply involved in developing the capabilities that organizations need to innovate better.

## 3. METHOD

Our approach was a case study (Gerring 2007), where we aimed at studying a phenomenon in its natural context with a practice lens (Orlikowski 1996). This allows for a more fine-grained study where the researcher aims at observing and analyzing actions at a detailed level, while also observing the larger organizational picture.

During a 15 months project, we aimed at strenghtening the participating organizations' knowledge about themselves, using a business process perspective. We did this by giving a customized 7,5 ECTS introductory course in Enterprise modelling. During the course we wanted participants to find promising issues for improvements from their own everyday work that could be described and analyzed in a small number of models. The three participating academic institutions in Norway and Sweden approved identical versions of the course so that the participants could take an exam at their "local" institution.

While the course itself only focused on modelling of the present as-is situation, the participants soon took advantage of the models and found solutions to the problems, and developed to-be models, which they also set out in practice.

Data about percieved effects and potential organizational effects for this paper was gathered from project presentations and discussions at plenary meetings, supervisor meetings at plenary meetings or face-to-face meetings between the plenary meetings, submissions and reports from participants.

The cases, which are also the participants' home organizations, were three municipalities (one Norwegian, and two Swedish), and one Norwegian governmental agency. The municipalities are of quite different sizes as shown in table 1. None of the municipalities had previously had any focus on business processes or enterprise modelling prior to the project. The Swedish participants had no knowledge of the approach or had any IT background. These participants had middle manager positions. The Norwegian participants from case A had knowledge of processes and modelling, and three members had IT background. They were two project managers, one middle manager and the CIO.

The governmental agency differed from the municipalities. It has a much more focused mission and business model than a municipality, and was already using a business process approach to improve efficiency and structure their organization to such an extent that they consider themselves process oriented. Some years earlier they had changed their organizational basis from departments to processes.

There were five employees participating from case D in the modelling. Four of them had middle manager responsibilities for process improvements in their areas and had experience in process modelling. The fifth is an enterprise architect with a company-wide responsibility.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Inhabitants	50.000	6000	2500	N/A
Employees in total	3.500	725	325	360
Employees involved	4	4	4	5
Groups (members)	3 (2+1+1)	3 (1+1+2)	2 (2+2)	1 (5)

**Table 1: Overview of the cases**

The following processes or activities were selected for projects:

- Recruitment process (A)
- Home care (A)
- Aid management (A)
- Pupil/school transports (B)
- Procurement to the local library (B)
- Planning of construction development (B)
- Helping more people into work (C)
- Reception of unaccompanied pupils and pupils with special needs (C)
- Inquiry/application process (D)

The motives for the selection differed, but the most common objective was that the chosen process had to be made more efficient and save money. The participants were actually responsible to find solutions to produce more or deliver more with less resources as part of their daily work.

Improving efficiency was not the only reason to choose a process. Other motives included:

- Gaining better competence about their tasks, problems and processes
- Unclear understanding of what we really are doing
- Utilize tools and models that can create common understanding of our business
- Communicate processes with different stakeholders
- What parts of the processes draw how many resources?
- Identification of bottlenecks

The course was structured in six modules; introduction, stakeholder analysis and context diagrams, goals and goal hierarchies, process modelling, assembly line diagrams and model analysis, completion and final presentations. The teaching of the course was a combination between physical meetings and digital teaching using the course platform (Hegerholm, Hedestig, and Klæbo 2015, Moodle). The six modules were presented and discussed during the physical meetings. Before the first physical meeting, the participating organizations had time to look into what projects would be most interesting and useful to work with.

The course lasted 7 months. There were three physical plenary meetings where all participants and teachers met. The pedagogical ideas of the meetings focused on letting the students work on modelling their chosen processes and avoid extensive lecturing, especially in the beginning.

The first meeting had theory presentations as well as an experience session from participant D. Then the groups spent most of the time working with their projects and to apply the theory while the teachers spent time supervising. In this way we supported a quick build-up of beginner's competence in modelling which in turn enabled the participants to continue on their own between physical meetings.

The second meeting took place after three months. In addition to a few more lectures and group work, we spent a considerable time on project presentations and discussions to facilitate cross-communication and learning. After four more months the last meeting took place. This consisted almost entirely of plenary project presentations and discussions.

Between the plenary meetings the teachers had face-to-face supervisor meetings with all the groups in turn in their respective organizations. This gave us a better view of the projects and also put some pressure on the participants to keep on working between plenary meetings. During the meetings with the groups they would present status and we would resolve problems concerning modelling issues. The supervisors also gave advice and helped the participants to think in "process oriented" terms. The digital course platform was also used between the meetings.

We emphasized practical considerations over model quality in order to avoid the risk of a student being stuck in the effort to formulate practice due to modelling language issues. We encouraged the students to work in groups, but ended up with four students working alone due to lack of partners. We found it more important that all participants could work with their own processes, even alone, rather than working in a group with a non-familiar problem of little use in their own practice.

All groups had members from only one participating organization. We intended to create mixed groups with participants from more than one organization, but this was not possible since the participants argued that their work was quite context specific and also would like to get some real useful and practical value back. There was also the practical matter to be able to work more easily in each group between physical meetings.

## **4. FINDINGS**

We present some preliminary results, as the gathered data is not fully analyzed. It is also not possible to draw any firm conclusions about organizational effects since this took place during a quite short time, and we have had no chance to observe effects over time.

Before the first physical meeting, the participating organizations had time to look into what projects they would like to engage in. All projects thus were known to and had support from top management in their home organizations.

In the following we present more details and preliminary results from some of the projects.

### **Case A**

Case A had three projects; recruitment process, home care, and aid management.

The participants had previous knowledge of processes and modelling, and three members had IT background. The projects were done within an overarching project in the organization focusing on the efficiency of work processes, and one participant (the CIO) was member of the top management group, so management support was very good.

One major result for case A is that Enterprise modelling has become an integrated part of their project methodology and will be used in all relevant projects. This is not due to this course alone, but it is a sign that they feel confident that Enterprise modelling is useful.

### **The Home care project**

This group consisted of one person – an experienced project manager who has worked in this area for several years. He has an IT background and has previously worked with service analysis within telecom.

The background for the case lies in the challenges and several years of frustration with not keeping the budget for delivery of home care services. Various change projects have not improved the situation. The motivation was therefore to see whether better understanding of the context and processes of planning and delivery could be a possible way to improve the situation.

In previous improvement projects very different opinions about the reasons for overspending the budgets was considered a problem, and the opinions would differ with different positions in the organization. Therefore this group was from the start planned to have one manager from Home care, one financial officer and one from IT. Only the person from IT was able to follow the course.

The concrete goals were therefore to see whether Enterprise modelling could improve common understanding of how visits to clients are planned and executed, and to document relationships concerning the most important stakeholders, and maybe reveal bottlenecks in relation to execution, and also matters concerning finance and budget.

Even if the project was done with very good management support, the participant expressed that "The support to do this is good, but in practice it was not possible to reserve a sufficient amount of time to complete the work".

The stakeholder/context analysis showed that in particular one stakeholder external to the department imposed heavy influence on the number of clients and therefore the amount of resources required. Work with the goal hierarchy was difficult and is not completed since explicit goals have not been formally implemented. The one explicit goal from political and administrative stakeholders that overrules all others is to "keep the budget".

The project has however been of practical use as the models have been used in introduction of new technology and new work processes in the 10 Home care offices. The process diagrams, assembly line diagrams and sequence diagrams are used to visualize the new processes. The participant also stated "As expected, enterprise modelling turned out to be a useful tool, but other employees from the area should have participated".

This employee also used this project as a basis for another internal project to clarify the details of delivering home care services. By using the sequence diagram to see how different roles interacted, they were able to change the process so that the nurses could concentrate more on their core activities.

## **Case B**

Case B had three projects: Pupil transport, Procurement to the local library, and Planning of construction development.

### **The Transport of pupils project**

Transport of pupils is regulated by law and has become very complex because of large distances and requirements regarding coordination with regular public bus transport. The Pupil transport project was done by one middle manager with no experience with Enterprise Modelling but with responsibility for the service.

The purpose was threefold: to be able to describe the job function so that management and politicians would understand it and be able to make good decisions, to review existing goals for the function and make these explicit, and to learn a structured method to develop and evaluate the function.

The goal hierarchy represented a challenge in this project as well. The participant said, "The presented goals are those that I have identified myself and worked with since I became responsible for this function."

The most tangible result of the project is a new alternative in the future organization of pupils' transport. The context diagram was found useful in presenting the complexity of the service, and to "receive confirmation that parts of this transport has taken more time, and has become ever more complex and complicated".

Other achievements were expressed as "I have now got a tool that allows me, in a structured way, to map, present, analyze and develop my function. Maybe I can even help others with their processes".

One side effect is that the job function is now described with all stakeholders and sub-processes. “It makes my function less vulnerable if I should change work or become ill”.

Modelling complex situations is a challenge and the participant expressed concerns about this as “the sub-models are too complex to be real useful over time, even for me”.

### **Case C**

Case C had two projects: helping more people into work and reception of unaccompanied pupils and pupils with special needs. None of the participants had any experience in modelling. Their home organization is a small municipality and all had middle manager positions. They had very good top-level support, but few resources and little time to do the projects.

A more general feedback from these projects is that the modelling gave better understanding of problem areas in the processes, and made it easier to identify bottlenecks, and that the approach looked promising in order to structure and visualize processes.

They emphasized the importance of working with the goals, especially to create a better understanding of what the mission really is for the various services and processes. One of the participants, with HR-responsibilities, said that the project had clarified the need for a more holistic view on management between departments, and that the lack of goals may be one reason of being a bad employer.

The major results based on the work of these participants are that this municipality already has adopted enterprise modelling as a method, and that the participants have been designated as the development team for services and processes.

They have used the models as part of decision-making and have changed their business objectives – ranging from the overall vision for the municipality to objectives for all offices. The objectives have been decided by the political committees in each office and serve as a starting point for the governance within each administrative office. A goal hierarchy for the whole municipality has been approved by the politicians, including vision, top level goals and goals for the departments.

### **Case D**

Case D is a government agency whose task is to collect debt and manage accounting. They offer digital first choice for citizens, employers and other principals and they have always had a special focus on operational efficiency and cost control.

Due to the nature of their service, they have a high number of inquiries each year. The inquiry process is costly and requires about 150 man-years annually. The chosen project aimed at seeking out possibilities to improve the process of handling inquiries. The motivation lies in digitization and cost-benefit, and is supported by the company’s strategy and top management.

They worked out detailed models, including context diagram, goal hierarchy, detailed concept model, and process model. In addition to these standard models for the course, they also worked out solutions for improvements and estimated costs and benefits of digitizing the enquiry process, of which benefits were: reduction of 20,5 man years, saving 10 MNOK or alternatively increase in income of approximately 40 MNOK by reallocation of resources, and savings related to fewer paper letters of 0.5 MNOK annually. Realizations of such benefits would require a coordinated effort from change management and HR.

Enterprise modelling in the sense of this course was not used the participants before even though process modelling using BPMN was well known. The difference that this course made to the previous experience is the context, concept and goal hierarchy diagrams.

One clear feedback from this group is that *looking at the company from the outside is essential* – which is what goal analysis will provide, and that *Process development requires competence from several areas*.

This group also spent quite some time on goal modelling and alignment of process goals to strategic goals. The effect of this part was expressed as: *now we are able to map the letter of allocation (from the government) into a goal hierarchy*.

As for more general findings, participants from all organizations expressed that the models created a good opportunity for common understanding of specific processes. This became quite clear in the final presentations of the projects where 3-4 models could quickly explain quite complex processes.

Also, it was suggested that the models could be a very good pedagogical tool, a) to introduce new employees and give a clear job and process description, b) to support management decision-making since models give a better overview of a process than long texts or oral discussions, c) to inform external stakeholders about a specific process.

Quite surprisingly to us, despite the short time of the project, all of the participating organisations have had one or more impacts to their organizations based on their acquired competence in modelling or the results from their cases. For example:

- A common project method that includes enterprise modelling is decided introduced in the one of the municipalities (case A).
- Case D had been working with process mapping and business development for a long time, but found that they had focused too little on the strategical level issues like goal hierarchies and interdependencies.

In summary, we find that the concrete results from the projects are much more tangible than expected. Presentations, both within the project and to politicians, indicates that models communicate and help explain complex problems. We also find that most time was spent on reflecting on the practice, guided by the modelling practice, not the actual making of models.

## 5. DISCUSSION

Although we cannot draw any firm conclusions based on our short project and study, our findings support the view that employee competence in enterprise modelling is a promising approach to service and process innovation. This is in line with previous research has shown that process mapping can have a positive effect on employees' ability to contribute to innovation (Iden, Andestad, and Grung-Olsen 2013).

Enterprise modelling seems to provide a new perspective and a competence to map and analyse work processes so that they can be communicated. This is a tool for change. If an organization invests in this competence by letting a broad set of employees learn the basics, then such an organization should be in a better position to adopt new practice more easily, ie. be more innovative.

Top-down approaches also produce models, but if external consultants make the models, they will not contribute to building competence and reflection among employees, and those models are also unlikely to contain the important details of practice. Enterprise modelling done by employees may be one answer to the challenge of making innovation projects turn into an organizational ability and not only accidental events (Sørensen and Torfing 2011). Besides building competence, we find that the modelling itself contributes to focus the discussions and problem solving, by placing the processes in a context and working with the goals and thereby applying an outside-in view (Iden, Andestad, and Grung-Olsen 2013).

We used an UML-based approach based on Eriksson and Penker (2000) as modelling language, but the language itself is not important. We do not believe that another modelling language like BPML (OMG) would make a difference, but we believe that it is important to do more than pure process modelling. The participants used most of their time working to understand their own practice and spent less time with expressing those results in the modelling language. All municipalities have a low process maturity level; few processes are defined, few goals are developed, and the perspective is not used in management. However, regardless of maturity, all groups spent a lot of time working with goals.

Those with low maturity and no experience (case B and C) seem to find Enterprise modelling and process thinking useful for developing common understanding, clarification of goals, and developing a new perspective on how their organizations work.

We observe, however, that case C decides to implement some changes in the whole organization. They have no experience and low maturity, but they appreciate the approach. In a quite small organization and with support from top management, they decide an organization-wide implementation. It is reasonable to believe that this is a result of knowledge obtained in this project. It will be interesting to see if this adoption makes this municipality different in the future.

Case A, that has more experience has moved a step further, at least in terms of modelling, and have taken more detailed diagrams into use to support introduction of new technology. This seems to yield results even if maturity may still be low in the use of goals and of Enterprise modelling or process thinking in analysis and management.

The mature organization (case D) is able to use models for several purposes: analysis, decision-making, planning, improvement, and management.

The models themselves communicate quite well. Based on the responses from the participants and the effects in the organizations, we would argue that there is a positive relationship between competence in enterprise modelling and the ability to present solutions to problems and plan how to change the processes accordingly.

We don't have any firm conclusions to rely on, but our preliminary findings support the research of Sundbo and Toivonen (2012) that an employee-driven approach can be an important success factor in service innovation. We will need further research to establish whether competence in enterprise modelling is an organizational capability that can support innovation in the public sector, given the right organizational settings.

We have observed that our approach supports a bottom-up approach and encourage employee creativity. The method is still quite structured and will focus creative initiatives to the greater organization development. The method provides a way to structure a vague and early phase of innovation and does not just leave employees to find their own ways (Price, Boud, and Scheeres 2012).

This project was a 15 month short project with the goal to test whether our approach to enterprise modelling could serve as a tool for employee-driven innovation. All partner organizations have also found it useful and will continue as partners in the follow-up project that will last three years. In the future project, two more Swedish and five Finnish municipalities will also participate. Although we have seen promising results, it is of course not only caused by our approach to enterprise modelling. The participants have been very interested and eager to be able to change, and have had very good support from their organizations.

Our approach may be learned quite fast, so quick competence build-up is possible, but more work is needed to refine the approach to make it more useful for different groups in an organization. Some types of models should directly address more strategic level issues and be directed towards higher management and decision makers, while other types could be directed towards analyzing how resources are spent. It is also possible to refine the models to make more detailed specifications e.g. to specify properties of IT systems.

Another point of discussion during the course is what kind of competence is required throughout the organization. It could be sufficient that most people in the organization had the competence to understand models; some could also have the competence to request additions or improvements, while some could have roles as model-makers and become highly skilled. This is an open question for the follow-up project.

Research on innovation in the public sector focusing on adaption of new practices requires experts from several disciplines, so we plan that the next project also will include researchers from organizational studies and political science as well as from information systems.

## 6. CONCLUSION

This paper reported from a short exploratory study on the role of building and using employee competence in enterprise modelling in public sector innovation.

Our research question was: how can enterprise modelling based on employee competence support public sector innovation.

Based on a case study of the participants and the effects in the organizations, we would argue that there is a positive relationship between employee competence in enterprise modelling and the ability to present solutions to problems and plan how to change the processes accordingly. Enterprise modelling done by employees builds a useful kind of competence in the organization and may be a fruitful way to become innovative, in the sense of being able to adopt new practice.

We have observed that our approach builds competence quickly and can encourage employee involvement and creativity. Still, the method is quite structured and should bring focus to creative initiatives for the benefit of the greater organization development.

The short course has had effects on the development of the competence of the participants, and we have observed some effects regarding ability to change in their respective organizations. The effects may also seem to come quickly and need not be dependent on high maturity or excellence in enterprise modelling, as case C showed us.

However, the paths from competence to actual organizational effects are contingent and require that organizations are able to get the results from what is invested in competence. This needs to be studied more carefully before any firm conclusions can be drawn.

The evaluation of both the course and effects it had on the participating persons' organisations were done right after the course ended. We will participate in the future development with the participants, as they all will be among the increasing number of partners for the coming project.

## ACKNOWLEDGEMENTS

Thanks to Botnia-Atlantical and Nordland Fylkeskommune for sponsoring this research.

A big thanks to all participants in the project, especially Mikael Söderström and Ulf Hedestig at Umeå University, and Kjell Ellingsen at University of Nordland.

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