DESIGN THINKING FOR THE IMPLEMENTATION OF INNOVATIONS IN THE HEALTHCARE SECTOR

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ABSTRACT

This paper explores design thinking as a possible road to successful implementation of innovations in the healthcare sector. The empirical context for this paper is an innovation programme in the healthcare sector in the county of Dalarna in Sweden. Staff and managers are important stakeholders in the implementation process, and therefore included as stakeholders in the design thinking process. Since we, as facilitators, are already active within this programme, but also study the experiences from it, the method for our study must be within the field of action research. The study is still ongoing. It started in September 2017, and will continue until June of 2018. What can be learned so far is thus, for the moment, very limited. One example of an interesting result is that management highlights the question of innovation's relation to the requirement for evidence-based operational development. Several managers identify this relationship as a central dilemma to handle. This is because the foundations of design thinking's are not perceived to harmonise with the theories behind evidence-based operational development.

INTRODUCTION

This paper discusses how design thinking can be used in the implementation phase of the innovation process within the healthcare sector. Moore & Hartley (2008) argue that the innovation process in the simplest form can be simplified into two phases - the idea generation phase and the implementation phase - when they argue that innovation occurs only when new ideas and practices are carried through to implementation. This study draws on this theory and contributes with a specific focus on the implementation phase, Figure 1.

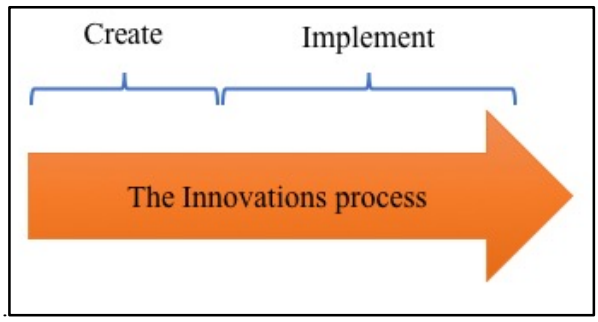

Figure 1. The figure illustrates the simplified description of two phases in the innovation process.

Design thinking as a method has proven to be useful for the idea generation phase of the innovation process, but has been less tested for the implementation phase insofar that the implementation phase to a large extent is about internal change management, i.e., changes and process development in relation to the organisation's own employees. This paper discusses experiences from a programme in which design thinking is tested for implementation, in order to explore how design thinking can be used not only for idea generation, but also for implementation.

Today´s health care systems are often described as fragmented and their operations rather controlled by the organisational structure than by the needs of the patient. Thus, there is a need for innovation based on the

patients´ needs. It is not uncommon that innovative ideas exist among the staff, but the challenge is to implement them. Brorström (2015) and Birken et al. (2015) have identified the step from idea generation to implementation as a major challenge in the public sector's ability to manage innovation as the innovation process often stops after idea generation.

Innovations can be made up of services, ways of acting or artefacts that are identified and classified as something new in a specific context. Even if the innovation is an artefact, such as a new assistive technology, it is almost never just a thing in itself but needs to be integrated into a service in order to be used. Implementation of innovations are often challenging and there is no consensus on the most effective strategy for successful implementation (Grimshaw, 2012). Factors such as the characteristics of the innovation, characteristics of the recipients and the context both on a local, an organisational and a health system level strongly influence the uptake of new practices (Harvey, 2015). Consequently, there is a need to test and evaluate new methods for implementation of innovations in the health care system.

Design-led processes are today identified as enablers for innovation in public administration. Scholars argue that a valuable toolkit can be found in the field of design thinking (e.g., Bason (2010) and Bessant & Maher (2009)). Design thinking is an often-used strategy or process to get a deep understanding of the target groups and to generate solutions suited to meet their needs. This has been described in previous research (Roberts, 2016) and there are ongoing examples where design thinking is used in dialogue with patients for practical development of health care (healthdesignby.us). There also exists a broad literature about difficulties with and experiences of implementing innovations in the healthcare sector. On the other hand, the research literature is relatively limited in design thinking as a strategy for involving health professionals in the roles as the future users of the innovation.

It is possible to use the scene as metaphor to describe the challenge. Design thinking has often been used to increase understanding between those on stage and those in the audience, i.e., increasing understanding among service providers through dialogue with the audience. But when it comes to implementation of innovation, the relationship with the audience is only half the perspective, the other half is about how the innovation is perceived and managed by colleagues in the given organisation. It is about the relationship between those on stage and those who work behind the curtain, in the dressing rooms and in the orchestra pit, Figure 2.

The aim of this paper is to discuss the question of how design thinking, by including colleagues in a given organisation, can be used in order to implement innovations in the healthcare sector.

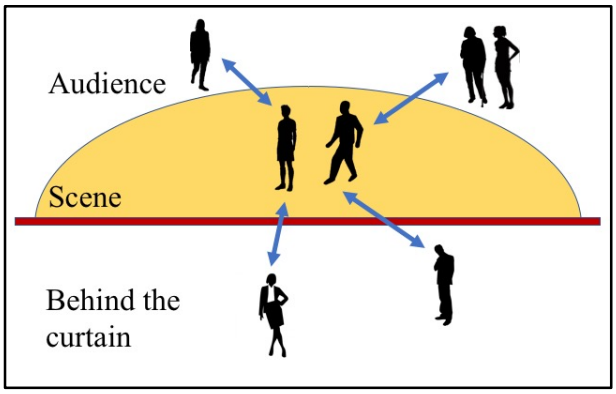

Figure 2. The figure illustrates the scene as a metaphor for the design process relating to clients and to colleagues.

We will explore if and how design methodology contributes to a process of implementation of innovations in four experimental projects at three units within the healthcare sector in Dalarna county.

LITERATURE AND THEORY

In order to study how design thinking can be used for supporting the implementation of innovations in the healthcare sector, an empirical investigation using action research will be conducted. In that work, a theoretical approach is needed. The importance of using a theoretical approach in order to establish a theoretical base in implementation research has been widely recognised (Nilsen, 2015). Consequently, the Normalization Process Theory (NPT) will make up the theoretical base and will also guide the data collection, the interpretation of data, to determine whether implementation is actually achieved, to what extent the innovation has become the new 'normal' way of doing things.

The NPT (May 2009), a sociological theory, sets out to explain and describe the processes by which new practices become embedded and integrated in the social context of everyday work. The theory focuses on the social organisation of the work, i.e., purposive social actions that involve the investment of personal and group resources, which is done to make the new practice work. According to the theory, new practices become embedded as a result of people working both individually and collectively to implement them. The embedding of an innovation may be accomplished through four generative mechanisms made up of contributions from individuals and groups involved in the process. A mechanism is here defined as "a process that brings about or prevents some change in a concrete system" (May 2013) and the mechanisms in NPT involve the processes of coherence, cognitive participation, collective action and reflexive monitoring.

Coherence, or sense making, refers to the process of differentiating between old and the new way of working and of developing a shared understanding of the purpose and value of the innovation and how it influences daily work. *Cognitive participation* is described as the process of enrolling staff, getting them involved and making them perceive that participating is a legitimate part of their role. The process of c*ollective action* is about integrating and carrying out the new practice as part of everyday work, whereas *reflexive monitoring* is the process of being aware of effects of the new practice and appraising the effects. However, contextual factors shape the conditions for the generative mechanisms and such factors may consequently promote or inhibit the mechanisms. The NPT will be used for interpreting the data from our empirical investigation in the experimental projects in the innovation programme described below.

METHOD

THE EMPIRICAL CONTEXT

The action research initiative underlying this paper is part of an innovation programme in the healthcare sector in Dalarna county in Sweden. County councils in Sweden County are responsible for publicly financed healthcare, medical care and some regional activities. The programme began on the initiative of the Division of Assistive Technology in the Dalarna County Council Regional Health Care Administration. Due to perceived deficiency related to the capacity and ability to implement innovations at the Division for Assistive Technology, the division's development team contacted the authors of this paper and proposed future cooperation on this issue. Consequently, a programme was developed aimed at utilising research to contribute to community development by creation and dissemination of new knowledge leading to increased innovation capacity. Thereafter, the Swedish government agency Vinnova granted a financial appropriation in order to finance the programme as a two-year cooperation effort between a) the Division for Assistive Technology in Dalarna County Regional Health Care Administration b) the Habilitation Division, c) the Division of Home care and Social services in the municipality of Leksand d) Dalarna University and e) Uppsala University.

The programme consists of two development initiatives. The first initiative focuses on capacity development for staff and managers and the second, the focus of this paper, focuses on an action-learning driven design process. The design process is made up of four different experimental projects, Figure 3. The programme is carried out with a holistic system perspective in the implementation by addressing; a) business structure, b) organisational culture, c) personnel management and d) economic development perspectives inspired by Bolman and Deals' (2003) theories of organisational development and management tools. Those management perspectives are also central perspectives in the capacity development of managers.

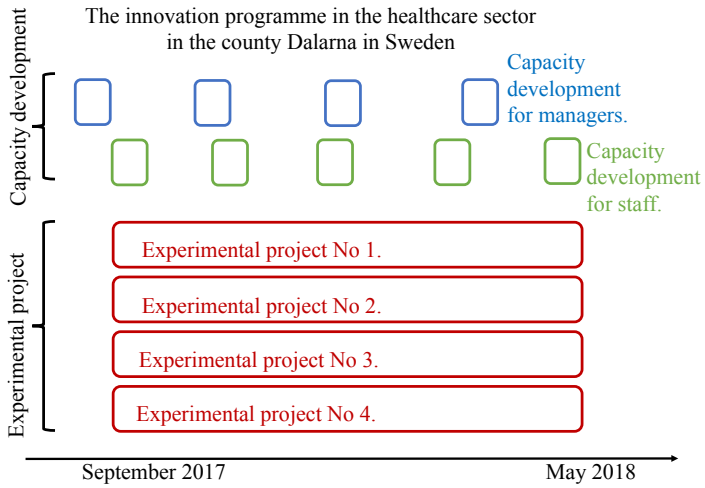

Figure 3. A description of the different aspects of the innovation project, and how they relate to the timeline.

The method of addressing these perspectives in the experimental projects is based on a design-based change process where implementation models are iteratively developed and tested. Malmberg (2017) describes the relationship between innovation in the public sector and design thinking by noting that: *Public sector organisations are in need of new approaches to development and innovation [...] in order to meet the demands on keeping costs down and quality high. Design is increasingly put forward as a potential answer to this need and there are many initiatives taken around the world to encourage the use of a design approach to development and innovation within the public sector (p. iii).*

A design-inspired method was chosen as the previous research specifies that design-related elements and methods are well-functioning methods for driving innovative development (Cross 2001; Norman 2002; Bason, 2010; Gazlulusoy & Ryan 2017). However, design thinking has been tested to a limited extent and evaluated for the implementation phase of innovation specifically and further explorations of its potential is needed. Willem, (1990) expresses the connection between design and science in an interesting way by stating that design makes science visible.

Further, in 2016, NESTA et al. published a PDF guidebook, "Designing Public Services: a practical guide". This guide brings together a collection of practical tools and methods for using design in public services. The publishers explain that the guide offers ways to do things differently by introducing the process of design thinking, and provides guidance on how to introduce this new approach into day-to-day work in the public sector. The design process in the present programme has been inspired by this guide.

In the Division for Assistive Technology, discussions have been ongoing during several years about the need to develop the organisational capacity for implementing new ideas, products and services. The discussion about innovations has taken place both among managers and

employees. In the Habilitation Division and the Division for Home Care and Social Services in the municipality of Leksand, this discussion has not been as apparent and these organisations have not initially been equally involved or motivated in the creation of this programme.

The aim of the programme is, more than simply actual implementation of innovations, to develop a management model for how the environment for innovation can be improved in the healthcare sector.

THE EXPERIMENTAL PROJECTS

The experimental projects studied in this innovation programme are still ongoing. The process was initiated in September 2017 and will continue until May 2018. The experimental project groups meet and work in workshops with the process facilitators (the authors of this article) on five occasions. See Figure 4.

Figure 4. The photo shows a design process in one of the experimental projects. Using Duplo ®, prototypes are created for how employees, within Assistive Technology on the Dalarna County Council, would like to handle an internal process.

The participants in the teams driving the experimental projects are also expected to take the design process further on between these occasions. In the five workshops, the teams driving the experimental projects discuss both the needs and roles of users and colleagues in the implementation of the innovations. The aim is to develop solutions based on both needs and conditions among the staff and target groups at the Division for Assistive Technology, the Habilitation Division and the Division of Home Care and Social Services in the municipality of Leksand. In the Division for Assistive Technology, discussions have been ongoing during several years about the need to develop the organisational capacity for implementing new ideas, products and services. The discussion about innovations has taken place both among managers and employees. In the Habilitation Division and the Division for Home Care and Social Services in the municipality of Leksand, this discussion has not been as apparent and these organisations have not initially been equally involved or motivated in the creation of this programme.

As previously mentioned, the experimental projects are conducted with a focus on innovation implementation. It means focusing on moving from an innovative idea or an innovation (artefact or service) to getting the innovation implemented, accepted and used by both the organisation's own staff as well as by users, i.e., target groups. To work with implementation is therefore largely about to change management within the organisation and in relation to users. The projects work through design thinking methodology in a way that internal change management in the implementation phase, i.e., changes and process development, becomes important. Thus, the organisation's own employees constitute an important part of the design process, with its focus on implementation of innovations – instead of generating new innovations. The five stages of design thinking are used; explore, emphasise, define, ideate, prototype and test. This means that, throughout the design process, the persons involved in each of the experimental projects will be involved in demonstrating the strengths of the innovation, working in dialogue and inclusion, as well as creating support systems for employees and users. The method also includes creation of a safe environment for implementation (where staff can experiment and learn about the innovation) and to demonstrate early gains with innovations, Figure 4. For each of the experimental projects, a working group with 4-5 representatives of the employees has been formed. The projects are briefly described below:

Project 1 is an internal project at the Division of Assistive Technology with a focus on improvement of the internal logistics. The task of the working group involves both generation of a solution to their problem and implementation of the generated solution. The working group involves employees from the Division of Assistive Technology.

Project 2 is an internal project at the Division of Assistive Technology with a focus on how to handle the border between assistive technologies considered to be commercial products and those that are prescribed. The task of the working group involves both generation of a solution to their problem and implementation of the generated solution. The working group involves employees from the Division of Assistive Technology.

Project 3 addresses issues in the interface between the Division for Assistive Technology and the Habilitation Division. The task of the working groups is implementation of a predefined innovation, a Skype-based solution for trying out and customising complex assistive technology. The working group involves employees from both divisions.

Project 4 addresses issues related to implementation of welfare technology in the interface between the Division of Assistive Technology and the Division for Home Care and Social Services in the municipality of Leksand. The task for the working group is to implement a predefined artefact; a digital pill dispenser. The working group involves employees from both divisions.

The design process will run for nine months with a workshop every second month. In between these workshops, the four groups work independently at their respective workplaces. The four working groups participate in the workshops together with the action research team and the programme management. The first workshop had a focus on supporting the working groups in how to define their task, clarifying the needs the implementation of the innovation will meet and defining the goals they want to achieve by implementing the innovation. After the four groups worked individually to identify the internal and external groups that will be affected by the change that the innovation entails by conducting interviews with colleagues. In the second workshop, the groups firstly presented their results from the interviews. On the basis of this, the groups reformulated the challenges they are facing, and then started generating ideas for solving them. Making prototypes with DUPLO, the groups explained their proposed solutions to each other. The 'homework' for the next workshop in January 2018 is to come up with a plan for how to actually implement this solution during the spring. From March to June 2018, an iterative process with further tests and refinement of the prototypes is planned with a number of turns.

RESEARCH METHODOLOGY

This paper discusses the experiences from the innovation programme taking place within the healthcare sector in the County Council of Dalarna in Sweden. The authors of this paper are the facilitators in this innovation programme. Since we, as facilitators, are already active within this programme, but also want to study the experiences from it, the method for our study must be within the field of action research. We study the processes we are part of initiating, in cooperation with the target group, for the changes they themselves wish to see. An action research initiative is therefore suitable.

The choice of action research methodology is inspired by Stringer (2013), who posits that action research may violate conventional research methods by not splitting up the relationship between the researcher and the researched objects in a classical way. However, Stringer (Ibid.) further claims that action research has a higher degree of democratic structure with a humanistic approach and supports the participants in the research process to increase their understanding of what is being researched and their own situation. Action research generally helps participants in the research process to solve their own problems. Chevalier & Buckles (2013) writes that Action Research today is included as an *"important method in work-based professional development courses and often includes interdisciplinary dialogue"* (p.1). Those perspectives are particularly important and relevant in the action research initiative underlying this paper.

DATA COLLECTION IN THE RESEARCH PROCESS

To gather empirical data on this process of using design thinking for the implementation of innovations, we use a convergent, parallel mixed methods design (Creswell, 2011) including both quantitative and qualitative data collection as we believe that such a design has potential to address the research question. The mixed methods design will be qualitatively driven and the quantitative component will provide an additional dimension to the results. We follow the four experimental projects during the nine-month design process. The qualitative data collection is carried out during the workshops for the experimental projects in the design process. In addition, for two of the experimental groups, projects 1 and 3, data collection will also be carried out in between the workshops (see details below). The selection of the projects was done as we wanted to include projects with a variation in their tasks; the combination of generation of a solution and implementation of the generated solution (Project 1) and implementation of predefined innovations (Project 3).

The qualitative data collection involves participant observation and informal conversations. We conduct participant observations during the workshops, and thus follow the design- and implementation process. Following the work of these groups outside the workshops at their workplaces consists of participant observation and informal conversations. The participants in the groups amongst themselves to decide on the next steps in their process and to work with them. We participate in these meetings, listen to what they say, ask questions when things are unclear, and also answer questions about the design thinking or the innovation programme at large. They work on things like what questions to ask their colleagues as they gather data on what their colleagues would need in order to accepting the innovation, conducting such interviews collectively, etcetera.

Complementing the data from the common workshops with all four groups, with data from two of the groups´ individual work enables us to get insights both into the way design thinking works as it is carried out, in the workshops, and how the participants reflect upon the whole process in their smaller, individual groups.

One early insight, indicating that both of these two kinds of data are required, is that within one of the groups, the first session they worked on their own outside the workshops did not in fact all deal with the implementation process according to the design methodology, but rather focused on trying to understand the context of the implementation programme at large. The questions they discussed were: Why did the workplace engage in the innovation programme - for the best of the employees and the patients, or to save money for efficiency? Who came up with the innovative idea, the managers or employees? Only participant observation at their actual workplace could have revealed that this was an issue of more pressing importance to the participants at this stage, than actually furthering the design process. Discussions on previous - and failed - innovative projects were also a common topic of discussion.

This qualitative material is gathered to understand the way the participant works with, reasons around and conceives of the implementation programme, their own experimental implementation project, design thinking and innovation in general, and their view on the willingness to innovate at their workplace.

The quantitative data collection consists of a questionnaire, the NoMAD. NoMAD (Finch, 2013) was developed based on the NPT in order to monitor progress in the implementation process and identify problems in the process. The four generative mechanisms in the NPT frameworks have been operationalised into 20 statements that are ranked on a 5-point Lickert scale ranging from “strongly agree” to “strongly disagree”. In addition, the options “not relevant to my role”, “not relevant at this stage” and “not relevant to the intervention” are also available. The NoMAD has recently been translated to Swedish and validated (Åberg, 2017). The NoMAD will be distributed to all health professionals who are the target group for using the new innovation at the included units. A baseline assessment will be carried out during December of 2017 and follow-ups will be conducted at 6 and 12 months. This quantitative strand will allow assessment of a larger population and thus capture the perception of the implementation processes among all staff/health professionals at the included units, whereas the qualitative strand will enable a greater depth in the understanding.

FINDINGS - SO FAR

At this moment, we have only very preliminary results, and no data yet from the survey. What can be learned so far in terms of results is thus at present very limited. There are some, even though very limited, results from what happens in the two working groups conducting experimental projects. We can see that things appear to run much more smoothly in the group that simultaneously works both with ideation and implementation. The other group has got stuck in questions about who this idea really comes from, what the rationale for the idea is - saving money for the good of the organisation rather than the staff or the patients? It seems this group got stuck in this question, rather than moving forward in the actual implementation process.

We can also see that some working groups have the view that the main purpose of the experimental projects is to elaborate a model for how organisations can work to implement innovations while other groups see that the purpose is simply the implementation of the innovation they are working on just now. The difference between these two different perceptions of purpose is primarily that the employees who have been involved for a long time in the organisation's discussions about the need to be better at implementing innovations sees the purpose of developing the organisation. For the stakeholders who came in later in this type of discussion, the aim is to implement the specific innovation in the experimental project.

Another preliminary result points to the importance of mid-level managers. The top managers involved in the implementation programme are very positive to innovation, and so are the staff working with design thinking. The mid-level managers, who are responsible for budget and for keeping the line activities running, have turned out to be more hesitant to give staff the necessary time to really work with the design process. This of course disturbs the implementation process significantly. However, this is not a matter of concern, since the mid-level managers are the ones who have to maintain both budget and quality of the day-to-day work, and to pay in terms of working hours lost to the design process. This may point to the crucial importance of anchoring projects of innovation and implementation at all levels of the organisation, not only top managers and the staff on the ground, but also among the mid-level managers. Other studies confirm this as well.

It also turns out that the relationship between the two moments in the programme, capacity development and the experimental projects, seems to be very important. The internal prerequisites for conducting these experimental projects are largely influenced by how managers look at innovation, design processes and the experimental projects. Some managers have, as a result of the capacity development initiative within the programme, begun to think and develop the organisational conditions for employees to work with the experimental projects.

During the process, many managers also highlight the question of innovation's relationship to the requirement for evidence-based operational development. Several managers identify this relationship as a central dilemma to handle. This is because the grounds of design thinking are not perceived to harmonise with the theories behind evidence-based operational development. It has led the managers to consider how to develop the organisation into more innovation-friendly organisations, in a culture dominated by the need for evidence-based development. The question that arises: How can trial and error be a working framework in a culture where error cannot occur?

Furthermore, both the work of experimental projects and the development of skills have led to more managers thinking about the role they play as cultural bearers and how to create a sense of confidence and a space for employees to try and dare to fail. The conversation has been raised about what the value base means and how it can be used to create an innovation-friendly environment. The management say it is important to create an atmosphere that allows those employees who want and can drive the innovative track and that other employees should not say "you're wrong".

The ongoing process has also led to the beginning of discussions about how to formulate recruitment ads in order to ensure recruitment of persons with knowledge and experiences important in order to work innovatively.

Another result of the process so far is that managers experience the four experimental projects as useful tools for "putting" the target group, i.e., patients and users, at the centre of the work process and increasing awareness of the needs and prerequisites of the target group.

DISCUSSION

Since the project has only come half way, and we are still waiting for the major part of the data, only a few topics are brought up in this section. The participants in the design thinking process have so far spent time discussing and questioning the purpose of their projects, but also potential values and benefits. The complex nature of the projects, involving employees from more than one organisation and/or division within the same organisation seem to increase the need to clarify these aspects from the perspectives of all participants in the project groups. The theory NPT highlights the importance of this 'sense-making work' focusing on the development of a collective as well as an individual understanding of objectives, tasks and responsibilities of a new practice. However, a review of factors that promote or inhibit implementation of e-health applications in the healthcare system, found only very limited focus on these aspects and suggest that this type of work may be overlooked (Mair, 2012). There is consequently limited knowledge about how effectively sense-making work can be facilitated and the present study has the potential to contribute with knowledge related to this important aspect of implementation.

However, in the initial phase of the design process, we see that these groups are in what can be called the downhill in Kübler Ross's change process curve. This means that a process of change in an organisation is often initially characterised by a negative, energy-consuming and struggling phase, for later take-off and getting rid of this negative phase where the process gives energy and participants' experience is more positive (Tippett & Elrod, 2002). Overall, the working group often passes through a phase of uncertainty and confusion before clear commitment and progress are developed.

Through the experimental projects, some managers are urged to relate the capacity development initiative to the concrete innovation work. That is to use the perspectives raised in capacity development. It has meant that the Bolman and Deal (2003) inspired four perspectives has been lifted and been applied. Based on an expressed need from the managers, the managers' competence development has also, (more than Bolman and Deal's four perspectives), been about cooperation structures internally and externally.

IMPLICATION FOR PRACTICE

There is a need to improve the ability to implement innovations in the healthcare sector. In order to succeed, it is important that implementation is supported by methodological best practice. This paper contributes with such methodological knowledge.

ACKNOWLEDGMENTS

We would like to thank the following organisations that made their research available for this paper.

The Swedish government agency Vinnova, Dalarna County Regional Health Care Administration Technical Aid Division, Dalarna County Regional Health Care Administration Habilitation Division and Care and assistance at Leksand Municipality.

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