EXPLORING AN INNOVATION PROJECT AS A SOURCE OF CHANGE IN ORGANIZATION DESIGN

JACOB BRIX • LOIS S. PETERS

Abstract: This study builds new empirically based theory on how the processing of an innovation project with a high degree of uncertainty induces change in key components in organization design. By using an embedded case study as our research strategy and organization design theory as our analytical lens, we construct ten propositions that determine how the organization design of our case organization was influenced because of their innovation project. These changes represent: a) improved competencies for exploration activities, b) improved competencies for exploiting new knowledge, and c) increased readiness for change.

Keywords: Organization design, innovation project, case study, public-private collaboration

Many public and private organizations today are experiencing stress and uncertainty because of environmental changes and turbulence (Huber, 2011). Innovation is often advocated as a means of responding to external challenges or to put pressure on competitors (Shelton & Percival, 2013; Tushman et al., 2010), and there is an extensive literature on how managers can organize for innovation (e.g., Anthony et al., 2008). In the innovation study presented here, however, the usual scholarly focus is inverted. That is, instead of exploring innovation outcomes and how they are produced, we focus on how an innovation project affects the design of the organization itself.

Our study was inspired by the limited number of previous studies of the effects of innovation on the producing organizations themselves (e.g., Arthur, DeFilippi, & Jones, 2001; Battisti & Iona, 2009; Brady & Davies, 2004; Brix & Peters, 2015; Shenar & Dvir, 1996; Wheelwright & Clark, 1992). Because these earlier studies determined that innovation projects can act as a catalyst to organizational change, the purpose of our study is to deepen current understanding by exploring how an innovation project influences organization design elements. We obtained access to uniquely relevant data regarding this research question by getting permission to observe a public-private collaboration on a high-uncertainty innovation project between the Center for Ideas and Innovation at the Danish Technological Institute and the Division for Education Management in the municipality of Ikast-Brande, situated in the central region of Denmark. The purpose of the project was to increase student learning outcomes by at least 20 percent through new means of childcare both before and after school.

The article is organized as follows. First, we describe the innovation project and the study's research method. Then we present the results of the study and discuss their implications for the theory and practice of organization design. Lastly, we note the study's limitations and present our conclusions.

Journal of Organization Design
JOD, 4(1): 29-43 (2015)
DOI: 10.7146/jod.17574

THE INNOVATION PROJECT

Using OECD's (2005) definition of innovation types, the Ikast-Brande project concerned new product/service development and/or the significant improvement of existing products/services offered to the municipality's inhabitants. Since earlier innovation initiatives in the municipality had focused on 1-2 percent improvement per year, this particular innovation project represented a major initiative containing a high amount of uncertainty for the Division for Education Management (DEM). Hence, the DEM contracted with the Danish Technological Institute (DTI) for two senior innovation consultants to advise and guide the municipality's team in a systematic innovation process led by the DTI (see further description below). The municipal team comprised a total of five persons from the DEM who were all affiliated with different institutions and/or departments in the Division. The team consisted of two managers from different caretaking institutions, one senior consultant from the Family Department, a senior consultant from the Administration, and a project manager from the Management Department. The unit of analysis was the actions and behaviors of the employees and the managers in each of these five institutions/departments participating in the project, which according to Yin (2009) represents a single case study with an embedded case design. Here an in-depth understanding of the actions and the impact of those actions within a singular entity is constructed, and the empirical evidence is used as a phenomenological foundation for the discovery of new insights to our research question (Eisenhardt, 1989, 1991; Yin, 2009).

RESEARCH METHOD

The Principal Investigator (first author) was a participant observer in the process from the project's inception in August 2012 until the presentation of 14 project concepts to the City Council of Ikast-Brande in January 2013. One advantage of not having both investigators from the research team immersed in case details is that a more critical and objective focus can be given to the analysis of the empirical evidence (Eisenhardt, 1989). Throughout the process, the DTI's consultants applied Brix and Jakobsen's (2013) Creative Idea Solution framework to make a systematic, disciplined approach to the innovation project. Here the team was guided from focusing on the purpose of their innovation project to creating an idea and concept portfolio of recognized and developed opportunities. The idea and concept portfolio then was used to create different outlines of new business models (Brix & Jakobsen, 2015). In total, the team presented 14 different business model outlines to Ikast-Brande's City Council in January 2013. Figure 1 shows a timeline of the key activities of the entire project.

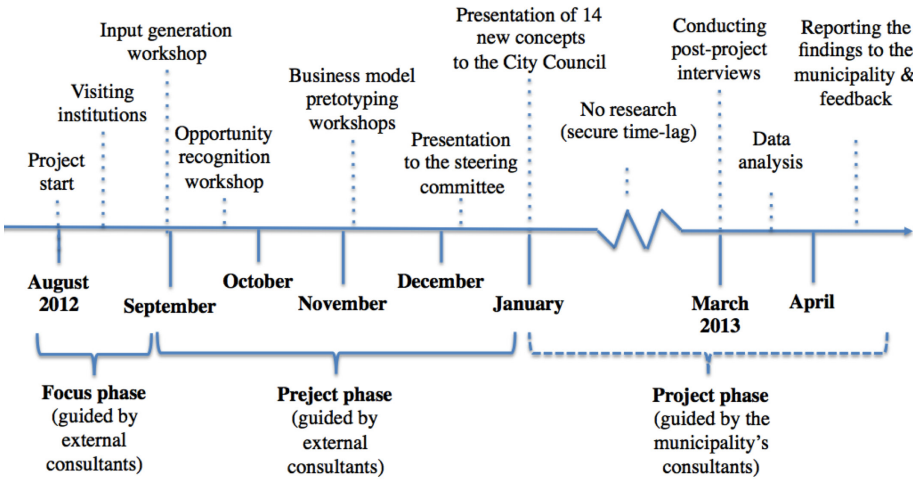

Fig. 1. Innovation Project Timeline

Study Data

Insights arose during field observations along with the collection of rich, diverse, and large amounts of data. In total, the Principal Investigator (PI) took part in (a) 72 hours of meetings concerning planning, task assignments, the internal dissemination of new insights, creation and development of ideas, etc.; (b) 20 hours of fieldtrips to different institutions and locations including various places within and outside the municipality; and (c) 18 hours of workshops to generate inputs for ideas and new business model outlines. The empirical evidence from the data collection process included pictures, video and audio clips, field observations, and notes from unstructured interviews. These data give insight about changes of individual habits and behaviors for participating team members and how they started to change the way they managed their employees and acted when dealing with managers above them. The DEM management allowed the PI to conduct post-project interviews with each of the five participating team members about the potential impact of the projects on their institution/department. To enable this, the research team used the data from the participatory process to develop an interview protocol that consisted of semi-structured questions embedded in a structured interview guide. The focus of the post-project interviews was directed at the behaviors of the staff in the respective departments/institutions of the team members, and these behaviors were all centered on key organization design elements (explained in more detail in the next section). The post-project interviews were conducted in March 2013 after two and a half months of time lag according to Guest's (2011) recommendations to identify what had become a new or changed routine in the informant's department. Here 15 hours of post-project interviews with the five team members from the DEM were conducted by the PI, and an estimated 90 hours of interview-related activities concerning transcription, feedback from informants, and dissemination of insights was conducted by the research team. It is data from the five post-project interviews that serve as the key source of empirical evidence used to answer our research question. Moreover, to underline the importance of the value of the participatory research strategy, the PI used the insight from the project participation to challenge the informants during the post-project interviews if/when a mismatch was identified between the informants' responses and stories regarding the espoused actions and the actual theories-in-use applied in their institution/department (Argyris & Schön, 1999; Whittington, 2006).

It is important to note that the findings generated from each interview could not have been obtained if the PI did not participate actively in the entire project, since the respondents sometimes did not realize that they had changed their behavior during the innovation project. Hence the results of the interviews and the following analysis could not have been realized with the same degree of robustness (Eisenhardt, 1991) if it was not for the longitudinal and participative research process that helped the research team challenge the assumptions of the informants (Eisenhardt, 1989). The main value of our methodological approach is that we utilize rich, longitudinal data deriving from participant observations to build empirically based theory (Colquitt & Zapata-Phelan, 2007; Crossan & Apaydin, 2010; Langley, 1999; Whittington, 2006).

Variables and Measures

We chose an organization design perspective to inspire the questions in the structured interview guide to ensure coverage of key organizational domains and bound our inquiries aimed at identifying behavioral changes on an institutional/departmental level of analysis. We followed the Burton, Obel and DeSanctis (2011) multi-contingency approach for several reasons. First, the concepts and the constructs utilized in their multi-contingency approach to organization design are well established in the literature (Burton & Obel, 2004; Håkonsson et al., 2008). Second, their framework views organizations as dynamic entities, which allowed us to assume that changes in organization design could occur because of innovation projects. Third, their approach is applicable to all types of organizations, both public and private, which fits our case organization. Fourth, the framework allows for the analysis of multiple layers within organizations, which also represents a theoretical fit to our embedded case design, where we move from the individual level of observation toward an institutional/departmental

level of analysis. Based on Burton et al. (2011), Table 1 is divided into strategic, tactical, and operational levels of analysis, containing 14 components each of which is measured by two elements. This results in a total of 28 organization design elements defined individually in the right-hand column of Table 1.

Table 1. Organization Design Elements

Strategic Level	Organization Design Element	Description
Goals	Efficiency	Focus on inputs, resources, and costs
	Effectiveness	Focus on outputs, products/services, and revenues
Operationalization of Goals	Exploration	Degree of search, variation, risk-taking, and innovation
	Exploitation	Degree of refinement, efficiency, selection, and implementation
Environment	Complexity	Number of factors in the environment and their interdependency
	Unpredictability	Degree of understanding of the environment

Tactical Level	Organization Design Element	Description
Configuration	Functional	Degree to which work is divided by specialized activities
	User oriented	Degree to which work is divided by product/costumer names
Organizational Complexity	Vertical differentiation	Height of the hierarchy
	Horizontal differentiation	Degree of task specialization across the hierarchy
Geographic Distribution	Optimal sourcing	The approach to manage across distance in terms of customer contact, cost efficiency, human resources skills need and other objectives
	Local responsiveness	Distributing work in many local settings versus consolidating work in one or few centralized locations
Knowledge Exchange	ICT-infused	The degree to which the organization is reliable of ICT equipment and software to manage knowledge
	Virtualization	The degree of boundary-spanning and "reach" used as basis of knowledge exchange
Task Design	Repetitiveness	The degree of standardization of execution of tasks
	Divisibility	The degree to which a subtask need coordination
People	Number of people	The number of people in the unit of analysis
	Professionalization	The collective skill level and the capabilities to solve work tasks
Leadership Style	Uncertainty avoidance	The degree to which top-management shuns to take action or make choices that involve major risk
	Preference for delegation	The degree to which top management encourages lower-level managers or other employees to make decisions
Organizational Climate	Tension	The degree to which there is a sense of stress or psychological 'edge' in the work atmosphere
	Readiness for change	The degree to which people in the organization are likely to shift direction or adjust work habits to meet new, unanticipated challenges

Operational Level	Organization Design Element	Description
Control and Coordination	Formalization	The degree to which the organization specifies rules and/or codes of conduct to govern how work is done
	Decentralization	The degree to which responsibility for coordination and control lies in the sub-units and at the individual managers
Information Systems	Amount of information	The overall volume of data and information that must be collected, processed and stored on a regular basis
	Tacitness of information	The degree to which it is difficult to codify and transfer information in an understandable manner
Incentives	Target of incentives	The degree to which individual or group/team performance is rewarded
	Basis of evaluation	The degree to which it is behavior and/or results that are rewarded

Source: Adapted from Burton, Obel, and DeSanctis (2011)

Structured Interview Guide

Having defined the 28 organization design elements, it is possible to have a systems-level understanding of the case organization and its innovation project. Data matrixes based on Table 1 were utilized to create the structured interview guide that could assist us in determining the way the employees in a department/institution focused their behaviors on a post-project basis. The structured interview guide contained questions related to strategic, tactical, and operational level behaviors. Questioning began by asking individuals to rate the 'associated behaviors with the organization design element' in their department (and not their individual/personal habits) on a pre-project basis and then afterwards on a post-project basis. Ratings were made on a scale ranging from 1-5 including half-measures. The pre- and post-project behaviors associated with the 28 organization design elements determine how a high-uncertainty innovation project influences each individual element by (a) changing it, (b) affirming the correctness of the behavior(s) associated with that element, or (c) the innovation project does not influence the design element. Additional details about the structured interview guide are presented in the Appendix.

Building 'Simple Theory'

Following Whetten's (1989) recommendations for building 'simple theory', we used each of the 28 organization design elements listed in Table 1 as a singular level of analysis representing *'the what'*. We used the influence the innovation project induced on each element as *'the how'*, and we used statements from the interviews following the analytical process described above to demonstrate the reason for change – *'the why'*. Answering these three interrelated questions – *what, how and why* – helps us build empirically based theory.

A limitation important to stress is that the purpose of the structured interview is to identify areas of change and influence, not to document the degree of change. The degree of change will be interesting to study in future research, but it is not the focus of the present study. Therefore, the elements presented in Table 1 are treated in a qualitative manner to get at the nuances of change related to a high-uncertainty innovation project.

RESULTS AND PROPOSITIONS

The results are divided into four sections in which the innovation project is a source of change in organization design: (1) strategic level, (2) tactical level, (3) operational level, and (4) effects across all levels. After presenting the results at each level of analysis, we build 'simple theory' (Whetten, 1989) at that level in the form of propositions.

Influence on Organization Design at the Strategic Level

The results show that most of the organization design elements in the participating institutions/departments were viewed as appropriate in terms of their prioritization of efficiency and effectiveness (see Table 2). This confirmation of being 'on the right track' was valuable to the managers leading these institutions/departments. For example, one of the managers stated: *"I found that our institution was on the right track based on the project because the preliminary results and the insights we got from the 'challenge of assumptions' really made it clear to me that the purpose of a future institution is not only caretaking but also learning."* Moreover, the innovation project gave the Division Management new tools and systematic methods to balance future work with innovation (effectiveness) in relation to improving the utilization of internal resources (efficiency). There was also confirmation that the Family Department could use the same tools and methods to make new initiatives more specific and thus more implementable. To back up this claim, a manager in the Administration said: *"We have started to focus much more on the outcomes of the resources we use on development projects, and the systematic process we have been through in our innovation process really made it clear to us that following such a systematic [process] to make progress was better than not having a clear guideline for the next step in different projects. We had tried controlled processes before, but not as systematic as this one, and our experiences have acknowledged the need for strict management of such projects."*

Table 2. Changes in Behavior at the Strategic Level

Strategic Level	Organization Design Element	Institution A	Institution B	Admin.	Family Department	Division Management
Goal(s)	Efficiency	√	√	√		+
	Effectiveness	√	√	√	+	
Operationalization of Goals	Exploration	+	+	√	+	+
	Exploitation	+	√	√	+	+
Environment	Complexity	-		-	-	√
	Unpredictability					

Legend: + = new behavior or more of the same behavior compared to pre-project;
- = less focus on this behavior than pre-project;
√ = confirmed that behavior is correct via the project;
(-blank-) = non-influenced

In relation to these strategic priorities, the behaviors in the institutions/departments on exploration and exploitation were also influenced by the innovation project. Here, the concrete methods used to search for new knowledge and to challenge assumptions influenced the behaviors in the participating institution/departments as well, since the institutions/departments had started to search and explore for new knowledge in other places than the pre-project context. In addition, the results of exploration were utilized more directly in daily operations (e.g., to improve a particular internal process or start up new initiatives). A concrete example to demonstrate this claim is presented by an institution manager: *"After having completed the innovation project we have started to be much more focused on exploring to get insight and we have learned new methods, which can help us in reaching our goals. Also, it has been excellent to experience that all the things we worked with six months ago are now more or less directly implementable to meet the pressure from our external environment (the new school reform), and we feel that we are ready to change, instead of before, where we would have been much more critical and skeptical of the changes forced from outside."*

Finally, the results show that the participating institutions/departments were less challenged by changes or new demands in the external environment, since the learning that occurred during the completion of the innovation project helped the institutions/departments react promptly to changes. This is argued via the following statement: *"Based on the experience of participating in the project, my staff and I feel much more ready to face the future and whatever changes that may emerge from external forces. By having worked with the whole perspective of rethinking our tasks and the outcomes of our tasks in solving our goals, we are now much more used to having the thoughts of a different looking future, and the thoughts are actually not as scary as they would have been one year ago pre-project."* The DEM was months in front of other municipalities in terms of its ability to change because of the innovation project.

Building simple theory of strategic-level design. The analysis of the pre- and post-project results on the strategic level of analysis reveal that an innovation project with high degrees of uncertainty can act as a positive source of change to organization design elements. These influences are: (a) verification of organizational goals, (b) improvement of exploration and exploitation activities, and (c) reduction of external uncertainty. Based on this identification, three propositions are developed to guide future research.

The first proposition is developed on the premise that the in-depth questioning and challenge of assumptions by organization members can assist in removing illusions and/or verifying current actions and directions. Moreover, there is evidence in the interview data that suggests the tools used in Brix and Jakobsen's (2013, forthcoming) systematic innovation approach can improve the behaviors needed to reach the required degree of efficiency and effectiveness in the participating organization.

> **Proposition 1:** The behaviors associated with efficiency and effectiveness can be improved by systematically processing an innovation project characterized by a high degree of uncertainty.

The second proposition is based on the premise that the respondents, because of the innovation project, learned new methods and tools they could utilize to construct new knowledge, and to develop and exploit that knowledge. Moreover, the areas of inquiry in the search for new knowledge went beyond the pre-project boundaries of the institution/departments and allowed for more cooperation and collaboration with new partners.

Proposition 2: Behaviors associated with exploration and exploitation are improved by systematically processing an innovation project characterized by a high degree of uncertainty.

The third proposition is based on the premise that the proactive search for a different future changed the mind-set of the employees and the management in the institution/departments. The employees had started to realize that the status quo could not be maintained, and because of the innovation project they found it more useful to create their own future instead of responding reactively to external contingencies such as new regulations and legislation.

Proposition 3: Complexity in the external environment is reduced by systematically processing an innovation project characterized by a high degree of uncertainty.

Influence on Organization Design at the Tactical Level

The organization design elements in the institutions/departments that were especially affected at the tactical level of analysis were knowledge exchange, leadership style, and organizational climate (see Table 3). In relation to knowledge exchange, particularly 'virtualization', the participating institutions/departments have started to work more professionally with knowledge creation as well as improving the process of decision making. During the innovation project, they experienced the value of collaborating with people, both internally and externally to the DEM, who had strong expertise. One manager in Institution A said: *"Before, I did try to challenge the way in which we worked in our institutions in the municipality, but it never really made any significant difference – perhaps because we all are alike and that we are from the same division and therefore influenced by similar ways of thinking. So our participation in the innovation project with external consultants as project leaders was a real eye-opener, since they were not colored by our ways of thinking."* The same argument was made by the project member from the Family Department: *"The project created a healthy disturbance in our department, because we had never been used to working so long time in a pre-project phase – that is, we are used to making quick decisions here in the municipality, but the method and the collaboration with the external consultants gave us some thoroughly prepared concepts, and it is quite certain that we will collaborate more with external consultants in the future, simply because of this healthy provocative disturbance."*

Table 3. Changes in Behavior at the Tactical Level

Tactical Level	Organization Design Element	Institution A	Institution B	Admin.	Family Department	Division Management
Configuration	Functional			√		+
	User oriented					
Organizational Complexity	Vertical differentiation					
	Horizontal differentiation					
Geographic Distribution	Optimal sourcing					
	Local responsiveness					
Knowledge Exchange	ICT-infused	+	√			
	Virtualization	+	√	√	+	√
Task Design	Standardized					
	Divisibility					
People	Number of people					
	Professionalization		√	√		
Leadership Style	Risk avoidance	√	-		√	
	Delegation of responsibility	+				
Organizational Climate	Tension					
	Readiness for change	+	+	+	√	√

Legend: + = new behavior or more of the same behavior compared to pre-project;
- = less focus on this behavior than pre-project;
√ = confirmed that behavior is correct via the project;
(-blank-) = non-influenced

With respect to leadership style and organizational climate, the participating institutions/departments experienced an increase in the search for new ways of working by the staff and the intensified mandate from management to initiate exploration of new activities. A manager in Institution A claimed: "*The project has affected the institution in such a way that the readiness to change has increased since we have learned to see the potential in exploring new ways of working, instead of being reactive to changes as they occur. Right now the culture in our institution has changed to be more conducive to searching for new things and also to trying to integrate the new things (…) we are not self-satisfied as much as before – normally we did not have to change anything because everything was nice, the parents were happy, and the children kept coming. But now, we are ready to offer an even better service to the children and the parents, and the self-satisfaction is lower, since the inspiration that occurs is in the context of searching for new insights."* In line with changes in the organizational climate, the project manager from the Division Management spoke about leadership: *"There is a clear result in the 'readiness to change' now, after the project, compared to before we initiated the innovation project. Before, the leaders were more reactive, and now they are more ready to change. Still, the ones who are most ready to change are the managers who were on the innovation team, then the managers who participated in the workshops, etc. But on a general scale, most of the managers are more ready to change. And this immediate result is excellent, because in the future there will be additional changes, and the requirement for change-preparedness will be even higher."* Hence, the increase in readiness to change has boosted the desire for change from previously being reactive and resistant towards the desire to lead change proactively – to co-create rather than adjust.

Building simple theory on the tactical level. The analysis of the pre- and post-project results on the tactical level of analysis reveals that an innovation project with a high degree of uncertainty can act as a source of change to organization design elements. At the tactical level, these influences are the (a) co-creation and use of knowledge with/from external sources and partners, and (b) increase of readiness for change. These influences lead to three theoretical propositions.

The first proposition is based on the premise that concrete experiences, as well as the tools and methods utilized in the innovation project, assisted organization members in refining their behaviors to create valuable outcomes in their institutions/departments.

> **Proposition 4:** The behaviors used to search for and construct new knowledge with external partners are improved by systematically processing an innovation project characterized by a high degree of uncertainty.

The next two propositions are based on respondents' claims that 'readiness for change' in their institutions had transformed to a more open and proactive approach compared to pre-project attitudes and behaviors. Moreover, the new insights in the departments/institutions demonstrate that pro-activeness assists in molding the future.

> **Proposition 5:** Readiness to change via an open attitude towards adaptation is increased by systematically processing an innovation project characterized by a high degree of uncertainty.

> **Proposition 6:** Readiness to change via a proactive orientation towards creating organizational changes is increased by systematically processing an innovation project characterized by a high degree of uncertainty.

Influence on Organization Design at the Operational Level

The changes that occurred to behaviors on the operational level of the participating institutions/departments were centered on two organization design elements: information systems (particularly 'tacitness of information') and incentives (particularly 'basis of evaluation'). As the professionalization of knowledge generation and management improved, the 'tacitness of information' increased in the institutions/departments. For example, the 14 new business model concepts made it more difficult to explain the background and the expected outcomes of the project to teams and to the project's stakeholders. Changes in behavior regarding expert knowledge search and integration challenged the previous way of working, since the new knowledge had to be translated into terminology relevant to different stakeholders. A manager from Institution A said: *"The complexity of our communication has increased since we are starting to work with more goal-oriented activities than before, and we have prioritized a more professional approach to doing our tasks as compared to before. And both my colleagues and I will do the best to deliver excellent value to the children – and to the parents, since they are the actual customers."* A manager in Institution B made a similar argument: *"The project has made some of the information we need to communicate more complex because insights from other knowledge areas have been integrated into our daily lives here at the institution. The 14 ideas we proposed in the innovation team had to be made more understandable for our staff, and also for other stakeholders, and this has been a complex situation. We have to translate some of the things so they can be understood by the staff."* The project manager from the Division Management stated that: *"We have via our experiences in the project found that it is important to communicate at all levels about new initiatives, and not only to the City Council or to the inhabitants of the municipality. If we want to make sure that the things we develop do not get misinterpreted by people afraid of change, on all levels, then we need to accept that it is quite complex to share this kind of information to different types of people who have different backgrounds and who are or could be affected differently by the implementation of such initiatives."*

The managers in the institutions as well as in the Division Management changed their approach regarding the basis of evaluation in the context of incentives. The project manager acknowledged that the way in which the Division Management gave incentives to its employees needed to fit promotion of the desired behavior. This argument was made clear because the managers stated that they had started to positively reinforce their staff based on their behavior rather than only on the results of their behavior. For example, the project manager from the Division Management said: *"We will begin to focus more on the acknowledgement of good behavior and not only good results, simply because if we desire ideas beyond the usual, then we need to foster experimental behavior among our employees."*

Building simple theory on the operational level. As with the strategic and tactical levels of analysis, the analysis of the pre- and post-project results on the operational level of analysis reveal that an innovation project with a high degree of uncertainty can influence behaviors associated with organization design. Here the influences are (a) tacitness of information and (b) basis of evaluation. These influences lead to two propositions.

The first proposition is based on the finding that new knowledge constructed during the idea and concepts development phase was difficult to communicate to stakeholders. This knowledge was both complex and unfamiliar to the participating institutions/departments.

> **Proposition 7:** The tacitness of information that needs to be communicated to project stakeholders (and understood by them) increases by systematically processing an innovation project characterized by a high degree of uncertainty.

The second proposition is based on the finding that managers on the innovation team changed their behavior because of incentives. Previous projects that lacked significant incentives resulted in 'short-termism' and small improvements. In this project, managers experienced the 'incentive' of the employees' proactive and knowledge-seeking attitudes to the development of new innovation proposals and concepts. Such attitudes made it quicker and more effective to implement new initiatives.

> **Proposition 8:** The basis of incentives moves from a result-oriented evaluation towards a behavior-oriented evaluation when systematically processing an innovation project characterized by a high degree of uncertainty.

Effects Across All Levels of Analysis

At the strategic level, all organization design elements except 'unpredictability' were impacted by the innovation project in at least four out of the five departments. Therefore:

> **Proposition 9:** The majority of strategic-level organization design elements are impacted by systematically processing an innovation project characterized by a high degree of uncertainty.

At the tactical level, seven out of 14 organization design elements were impacted to some degree by the innovation project, and all departments noted an impact with respect to knowledge exchange and readiness for change. At the operational level, three out of six organizational processes were impacted to some degree by the innovation project. Therefore:

> **Proposition 10:** The impact on strategic-level behaviors is greater than on tactical and operational behaviors when systematically processing an innovation project characterized by a high degree of uncertainty.

DISCUSSION

Our participatory theory-building research strategy represents a useful methodology to uncover the dynamics of organization design elements when they are faced with the systematic processing of an innovation project with high degrees of uncertainty (here cf. Brix and Jakobsen, 2013; Brix and Jakobsen 2015). We could be at the foundation of a new research agenda that provides indications to study the dynamic influence and change in organization design because of an innovation project, as opposed to the organization design's impact on an innovation project, cf. Obel, Burton and Lauridsen (2004), Tushman et al. (2010) and Phelps, Bessant and Jones (2006). This is argued, since our discovery, explanation and development of ten propositions help us claim knowledge to the question: *'how does the processing of a high uncertainty innovation project affect organization design?'*.

First, the overall results correspond hitherto research on the relationship between an innovation project and its affects on an organization e.g. Shenhar and Dvir, (1996), Arthur, DeFilippi and Jones (2001), and Brix and Peters (2015), since the systematic processing of the case study's innovation project did represent a change within the organization by having influenced multiple organization design elements. Moreover, the informants claimed

that all the changes represented beneficial side effects except for the increased 'tacitness of knowledge', which was regarded as a downside stemming from the project. An explanation to this singular negative phenomenon can be found in the context of 'managing uncertainty' cf. Van de Ven (1986) and O'Connor and Rice (2013). Here information processing (Galbraith, 1974) or more precisely communication about (radical) new initiatives represents higher degree of uncertainty because more unknown factors need to be understood by the projects stakeholders compared to small-scale improvement projects where many variables are known (also cf. Talke and O'Connor, 2011; Brix, 2014). Even though this downside emerges it is not a central problem in itself; however, it will be a central problem if it is not managed appropriately cf. Eppler (2006) and O'Connor and Rice (2013).

Second, we establish that the learning and change of behavior that occurs during an innovation project is adopted, both noticed and unnoticed, into the behaviors of the staff in the departments participating in the projects and is reflected in organizational design elements. Here our findings advance current understanding on how project-led learning acts as vehicle for change in the organization, cf. Shenhar and Dvir (1996), because our research extends their work by determining that the overall 'readiness to change' is increased in the participating departments, because of the innovation project. Here we suggest that it is the change in leadership style focusing on exploration rather than exploitation that could have been the impetus for change cf. Obel, Burton and Lauridsen (2004).

Third, our study reveals that knowledge and behaviors related to 'new tools and processes to manage innovation' are absorbed into the participating institutions and departments without a formal transition period where project-led learning is transitioned towards business-led learning and more importantly, without formal requirements or incentives to do so (cf. Brady and Davies, 2004). Our contribution here lies within the 'automatic transition' of process-oriented knowledge, and not technical or factual knowledge (e.g. Brix, 2014) related to the development of the new products or services that were developed to reach the purpose of the public-private collaboration on innovation.

Fourth, we uncover six concrete organizational design elements that are positively influenced because of the innovation project, e.g. the change of giving incentives based on behavior and not results. These organization design changes relate to improved behaviors for exploration and exploitation cf. March, 1991 and Tushman et al. (2010), to an more open approach to collaboration with external partners, and an increased focus of the 'readiness to change' by 1) adapting to – or 2) proactively challenging status quo in relation to uncertainties in the external environmental cf. Obel, Burton and Lauridsen (2004) and Cui and O'Connor (2012).

The fifth contribution is that our research lead us to identify hitherto undocumented change in organization design elements, which traditionally are not at the conscious forefront of managers, such as increased recognition of the importance of behavior, and more specifically, behavioral changes that can increase the efficient use of human resources in relation to both exploring new potential futures and learning to exploit the knowledge that has been constructed. Based on this perspective, we boldly claim that even though an innovation project might fail concerning the intended purpose, the multiple emerging changes in behavior and/or verification of organization design elements influence the organization in such way that success on an organizational level of analysis is evident because internal contingencies and design elements (cf. Burton and Obel, 2004) are adapted to fit future changes. More research is needed to back up this claim.

IMPLICATIONS

To the extent that the identified dynamic change of behaviors are equivalent or similar to organizational routines, we argue that our findings are in line with Feldman (2000), Pentland and Feldman (2005) and Pentland, Hærem and Hillison's (2011) research on the dynamic nature of organizational routines, since the influenced behaviors are not only verified and changed through nuanced actions; they are also developed to induce future changes via proactive exploration and search for new insight. Here research on organization design and its necessary fit with organization routines cf. Helfat and Karim (2014) could represent a

beneficial avenue for research in understanding how change of individual behaviors induce change on the organizational routines because of an innovation project, so that internal contingencies are better fit to adopt the results of the project. More research in needed to understand this nexus.

STUDY LIMITATIONS

The main limitation of our study is that it explores only a single project and its impact on a few organizations. In addition, we monitored the institutions and departments until the changes they made were solidly in place, but we do not know if those changes fostered additional outcomes, either positive or negative. There is a need for further research to explore if these are general tendencies across other public institutions, if the effect on private sector organizations is different from public organizations, and if the effect on national organizations is different from international ones, as well as if the effect differs when comparing large versus small and medium-sized enterprises. The ten propositions represent interesting phenomena to organization science that could be beneficial to further understand.

CONCLUSION

We studied a public-private innovation initiative, where the Department of Education Management (DEM) in the municipality of Ikast-Brande contracted with the Danish Technological Institute (a private consultancy) to rethink how the DEM could provide a better learning context for children and adolescents in the municipality. Within this context, we took a unique perspective on the innovation process in that we explored the effects of innovation on the organization rather than the outcomes of the innovation project.

Our study contributes to the organization design literature in several ways. First, we introduced a new perspective – how an organization is affected by planning and implementing an innovation project. Second, our research identified six concrete design elements that changed because of the innovation project, some of them unnoticed by management. These changes were considered beneficial for DEM managers and employees because the changes represented new or adjusted behaviors that could result in a more efficient use of human resources in the five participating departments. Third, we found that information processing becomes increasingly complex among project stakeholders as the project develops – new ideas emerge that are more complex and unpredictable compared to earlier outputs of the municipality's innovation projects. Finally, we set the stage for understanding how a high-uncertainty innovation project impacts the performance of an organization by exploring the behaviors associated with the strategic, tactical, and operational levels of the organization.

Acknowledgements: We wish to thank the two anonymous referees for their outstanding feedback on earlier versions of this manuscript. We also thank the associate editor, Samina Karim, for her excellent assistance and encouragement during the review process. The first author would like to thank the Municipality of Ikast-Brande and the Danish Technological Institute for allowing him to participate in the innovation project.

REFERENCES

Anthony SD, Johnson MW, Sinfield JV, Altman EJ. 2008. *Innovator's Guide to Growth: Putting Disruptive Innovation to Work*. Harvard Business School Press, Boston, MA.

Argyris, C. and Schön, D.A. 1974. *Theories in practice*. Jossey-Bass, San Fransisco, CA.

Arthur MB, DeFillippi RJ, Jones C. 2001. Project-Based Learning as the Interplay of Career and Company Non-Financial Capital. *Management Learning* 32(1): 99-117.

Battisti G, Iona A. 2009. The intra-firm diffusion of complementary innovations: Evidence from the adoption of management practices by British establishments. *Research Policy* 38(8): 1326-1339.

Brady T, Davies A. 2004. Building Project Capabilities: From Exploratory to Exploitative Learning. *Organization Studies* 25(9): 1601–1621.

Brix J. 2014. Improving individual knowledge construction and reconstruction in the context

of radical innovation. *International Journal of Innovation and Learning* 15(2): 192-209.

Brix J, Jakobsen HS. 2013. Corporate Creativity: Introducing the Creative Idea Solution© framework. *International Journal of Innovation and Learning* 13(4): 388-405.

Brix J, Jakobsen HS. 2015. Business model pretotyping: exploring pre-commercialisation opportunities in practice. *International Journal of Innovation and Learning* 17(1): 98-110.

Brix J, Peters LS. 2015. The Performance-Improving Benefits of a Radical Innovation Initiative. *International Journal of Productivity and Performance Management* 64(3): 356-376.

Burton R, Obel B. 2004. *Strategic Organizational Diagnosis and Design: the Dynamics of Fit*, 3rd edition. Kluwer Academic Publishers, Boston, MA.

Burton R, Obel B, DeSanctis G. 2011. *Organizational Design: A step-by-step approach*, 2nd edition. Cambridge University Press, Cambridge, UK.

Colquitt JA, Zapata-Phelan CP. 2007. Trends in theory building and theory testing: a five-decade study of the Academy of Management Journal. *Academy of Management Journal* 50(6): 1281-1303.

Crossan MM, Apaydin M. 2010. A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the literature. *Journal of Management Studies* 47(6): 1154-1191.

Csaszar PA. 2013. An efficient frontier in organization design: organizational structure as a determinant of exploration and exploitation. *Organization Science* 24(4):1083-1101.

Cui AS, O'Connor GC. 2012. Alliance portfolio resource diversity and firm innovation. *Journal of Marketing* 76(4): 24-43.

Eisenhardt KM. 1989. Building theories from case study research. *Academy of Management Review* 14(4): 532-550.

Eisenhardt KM. 1991. Better Stories and Better Constructs: The case for rigor and comparative logic. *Academy of Management Review* 16(3): 620-627.

Eisenhardt KM, Graebner ME. 2007. Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal* 50(1): 25-32.

Eppler MJ. 2006. The concept of knowledge communication and its relevance to management. USI Research Note version 2. 2 July.

Feldman MS. 2000. Organizational Routines as a Source of Continuous Change. *Organization Science* 11(6): 611-629.

Galbraith JR. (1974) Organization design: and information processing view. *Interfaces* 4(3): 28-36.

Guest DE. 2011. Human resource management and performance: still searching for some answers. *Human Resource Management Journal* 21(1): 3-13.

Huber GP. 2011. Organizations: Theory, Design, Future. In. *The APA Handbook of Industrial and Organizational Psychology – Building and Developing the Organization*. Vol.1. American Psychological Association, Washington DC.

Helfat CE, Karim S. 2014. Fit between organization design and organizational routines. *Journal of Organization Design* 3(2): 18-29.

Håkonsson DD, Burton RM, Obel B. 2008. How failure to align climate and leadership style affects performance. *Management Decision* 46(3): 406-432.

Langley A. 1999. Strategies for theorizing from process data. *The Academy of Management Review* 24(4): 691-710.

March JG. 1991. Exploration and exploitation in organizational learning. *Organization Science* 2(1): 71-87.

Obel B, Burton R, Lauridsen J. 2004. The impact of organizational climate and strategic fit on firm performance. *Human Resource Management* 43(1): 67-82.

O'Connor GC, Rice MP. 2013 A comprehensive model of uncertainty associated with radical innovation. *Journal of Product Innovation Management* 30(1): 2-18.

OECD 2005. *The Oslo Manual: Proposed guidelines for collecting and interpreting technological innovation data.* Organisation for Economic Co-operation and Development, European Commission, Brussels

Pentland BT, Feldman MS. 2005. Organizational routines as a unit of analysis. *Industrial and Corporate Change* 14(5): 793-815.

Pentland BT, Hærem T, Hillison D. 2011. The (N)Ever-Changing World: Stability and Change in Organizational Routines. *Organization Science* 22: 1369-1383

Shelton R, Percival D. 2013. Breakthrough innovation and growth: top innovators expect US$250 billion five-year revenue boost. Pricewaterhouse Cooper's Global Innovation Survey, September.

Shenhar AJ, Dvir D. 1996. Toward a typological theory of project management. *Research Policy* 25(4): 607-632.

Snow CC, Fjeldstad ØD, Lettl C, Miles RE. 2011. Organizing continuous product development and commercialization: the collaborative community of firms model. *Journal of Product Innovation Management* 28(1): 3-16.

Sutton RI, Callahan AL. 1987. The stigma of bankruptcy: Spoiled organizational image and its management. *Academy of Management Journal* 30(3): 405-436.

Talke K, O'Connor GC. 2011. Conveying effective message content when launching new industrial products. Journal of Product Innovation Management 28(6): 943-956.

Tushman M, Smith WK, Wood RC, Westerman G, O'Reilly C. (2010) Organizational design and innovation streams. *Industrial and Corporate Change* 19(5): 1331-1366.

Van de Ven AH. 1986. Central problems in the management of innovation. *Management Science* 32(5): 590-607.

Westerman G, McFarlan FW, Iansiti M. 2006. Organization desing and effectiveness over the innovation life cycle. *Organization Science* 17(2): 230-238.

Whetten DA. 1989. What constitutes a Theoretical Contribution? *The Academy of Management Review* 14(4): 490-49.

Wheelwright SC, Clark KB. 1992. Revolutionizing product development. Free Press, New York, NY.

Whittington R. 2006. Completing a practice turn in strategy research. *Organization Studies* 27(5): 613-634.

Yin RK. 2009. *Case study research – Design and Methods*, 4th edition. Sage Publications, London, UK.

JACOB BRIX

Assistant Professor
School of Business and Social Sciences, Aarhus University, Denmark
E-mail: brix@auhe.au.dk

LOIS S. PETERS

Associate Professor
Lally School of Management, Rensselaer Polytechnic Institute, Troy, NY USA
E-mail: petrel@rpi.edu

APPENDIX

With respect to the structured interview guide, the two examples below exemplify how a change (+/-) is registered in the dataset and how a behavior is affirmed as being correct (√) according to the existing situation of the institution/department within the DEM.

The first example demonstrates the documentation used to identify a change in an organization design element while interviewing a team member from Institution B, who is a manager in that institution. The question derives from the structured part of the interview, and it relates to the tactical level of analysis where it is the 'organization climate' that is in question. Here the two elements in the data matrix are 'tension' and 'readiness to change' (Burton et al., 2011). In the interview protocol, the PI registered an increase in 'readiness to change' for the employees in the institution on a post-project basis. The reason for this is based on the informant's statement during the interview, where he claimed that 'readiness to change' on a pre-project basis is a '3' and that it had increased to a '4' on the 1-5 scale ranking because of the innovation project. The quote below demonstrates the answer given by the manager to the question: What is the reason for a changed mindset in your institution in relation to 'readiness to change'?

"There is no doubt that my personal readiness to change has exploded because of the project, and I am sure and aware that this readiness to change is influential to the staff – no one is rolling their eyeballs anymore when new ways of working or new initiatives are suggested, simply because they have been positively surprised with some of the ideas we worked on in the project. Now the staff is much more moldable to future changes, since they see the potential in at least some of the new ideas we presented based on the project."

Since the structured interview was created as a critical inquiry, a change claimed by the informant was not accepted if he or she could not give a concrete example of the change in behavior in relation to the claim. The statement above represents such claims since concrete examples were said to have occurred during the innovation project. The arguments used to substantiate the acceptance of change in the domain of 'readiness to change' are based on the respondent's three claims: (a) 'decrease of eyeball rolling', (b) 'positively surprised with some of the ideas', and (c) 'much more moldable to future changes (…) based on the project'.

The second example demonstrates the documentation utilized to determine how a behavior was acknowledged as being relevant and in line with the current reality of the department. Here the organization design elements 'ICT infusion' and 'virtualization' represent the elements in the data matrix concerning 'knowledge exchange' (Burton et al., 2011). According to the informant, the innovation project had not per se changed any behaviors in relation to the specific organization design elements, but the project had created awareness of the behaviors associated with the elements. During the post-project interview, the informant claimed:

"During the project, we confirmed that we are on the right track when we explore and create new opportunities with external partners. There is a certain value in cooperating with people external to the municipality, because of the critical questioning by these people, who are not biased by the culture, etc." Principal Investigator: Could you give me a concrete example? Respondent: "(…) yes, before our project, some of the managers from different institutions tried to collaborate to find new ways of restructuring some parts of a work task [classified], but the suggestions they presented to the division management were not, by us at least, considered radical. So when we had the external consultants come in and help us, we finally got the 14 new quite radical concepts, which we presented to the City Council – so I guess that is a good example."

In the interview, the respondent demonstrated two things that made him aware that existing actions and behaviors regarding 'virtualization' were still appropriate. The first was 'the managers attempt to create radical innovation unsuccessfully', and the second was 'the 14 new more or less radical concepts that were developed in collaboration with external partners'. Even though there is no change of perspective in the organization design elements, the respondent found the acknowledgement valuable to the Division Management in that they confirmed the appropriateness of their actions and behaviors in relation to 'knowledge exchange'.