Reflections on a Reflective Cycle:
Building Legitimacy in Design Knowledge Development

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ABSTRACT

In this paper we seek to develop a better understanding of how design knowledge development (DKD) ventures may gain 'good currency.' The reflective cycle is generally considered to be a key element in the accumulation of design knowledge, and is seen to be crucial to the interface of science and design. However, the elements that may encourage or inhibit the enactment of this cycle in development ventures have received scant attention in the literature on organizational design. In our analysis, we show how DKD ventures face important barriers related to the institutional context and institutional entrepreneurship. We argue that the current conceptualizations and practices of knowledge development in organizational design need to pay much more attention to building legitimacy.

Keywords: organization design knowledge, reflective cycle, institutional theory

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In this paper we seek to develop a better understanding of how design knowledge development (DKD) ventures may gain 'good currency.' The reflective cycle is generally considered to be a key element in the accumulation of design knowledge, and seen to be crucial to the interface of science and design. However, the elements that may encourage or inhibit the enactment of this cycle in development ventures have received scant attention in the literature on organizational design. In our analysis, we show how DKD ventures face important barriers related to the institutional context and institutional entrepreneurship. We argue that the current conceptualizations and practices of knowledge development in organizational design need to pay much more attention to building legitimacy.

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INTRODUCTION

Within the field of organizational design, the development and accumulation of design knowledge is regarded as one of the key elements in addressing the persistent barriers between science and praxis (Duncan, 1974; Astley and Zammuto, 1992; Kieser, 2002; Romme, 2003; Hevner et al., 2004). Central to this design knowledge production is the reflective cycle (Dewey, 1933; Kolb, 1984; Orlikowski, 2004; Van Aken, 2004). This suggests that by means of continual pragmatic experimentation, ideas from organization science can be developed into a coherent set of grounded and tested technological rules. In a process of "learning from enactment" (Orlikowski, 2004: 94), successful experiences in praxis with these design rules are used to refine the designer's current repertoire

(Schön, 1983) and provide the rudiments for a validated design knowledge base. In changing existing complex situations into preferred ones, designers can draw on this available body of design knowledge (Simon, 1969; Schön, 1983; Daft, 2001; Boland and Collopy, 2004). Experience with this knowledge in the diagnostic and therapeutic parts of design may subsequently feed the development of new knowledge (Van Eijnatten and Hoevenaars, 1989; Hevner et al., 2004).

Such an understanding of the elements that enhance the technical performance of design approaches is critical, but equally important are the *specific conditions* that may inhibit or encourage the process of developing design knowledge. Clearly, design knowledge development (DKD) ventures are of crucial importance. Specifically, they can enhance organizational design processes by fuelling reflective activities, thereby increasing the relevance of organization science to praxis (Romme and Endenburg, 2006). Yet, many of the validated organizational design approaches that are initiated and constructed tend to face the problem of, what Van de Ven (1986) refers to as, managing it into 'good currency' (see, for example, De Sitter et al., 1997; Benders and Stjernberg, 2000; Benders et al., 2000; Warren, 2004). The inability to create and maintain legitimacy for a DKD venture will unavoidably hamper the performance of the reflective cycle. As a result, this will eventually tarnish the viability of the underlying design knowledge. As Starbuck emphasized: "Creating, applying and preserving intertwine and complement each other" (1992: 722). The viability of validated design knowledge in the organizational field is essential for professional schools to "reassume their professional responsibilities" (Simon, 1969: 113) through accumulating and teaching a science of design. This also decreases the likelihood that organizations reinvent the wheel and thereby repeatedly make the same elementary design mistakes (Lammers, 1988; Van Bijsterveld, 1997; Benders and Vermeulen, 2002).

This paper seeks to advance insight into the potential barriers to DKD by studying how a development venture may gain legitimacy. We draw on the institutional literature because it provides an understanding of how ideas and practices 'win acceptance' (Suchman, 1995; Zimmerman and Zeitz, 2002) beyond their technical efficiency. Institutional theorists have shown that building legitimacy is crucial not only to the survival of organizations (Human and Provan, 2000; Scott, 2001; Kumar and Das, 2007),

but also to the persistence of ideas and practices in concrete ventures (Zimmerman and Zeitz, 2002; Heusinkveld and Benders, 2005; Reay et al., 2006). Accordingly, we argue that gaining legitimacy is needed in current conceptualizations and practices of the reflective cycle of DKD if organizational design is to adequately bridge organization science and praxis. The study extends current design theory by exploring some key mechanisms that shape the development of design knowledge ventures related to: 1) the institutional context and 2) institutional entrepreneurship, elements that are still underdeveloped in the current design literature. By better understanding which specific elements may encourage or inhibit legitimacy of the reflective cycle in DKD ventures, students and practitioners of organizational design can enhance the conditions favorable to sustainable knowledge development in organizational design.

We start this paper by discussing current views on DKD and enactment in organizational design and reviewing present conceptualizations of: 1) the reflection process and 2) the key characteristics of a validated design knowledge base. The discussion then draws on the institutional literature to show how the concept of design legitimacy provides important insights into the impediments inherent in the generation and establishment of new design rules. The discussion empirically illustrates the implications of these insights for knowledge development in organizational design by drawing on a case of the evolution of a piece of design knowledge. Finally, we draw conclusions and discuss implications for the current organizational design literature and design praxis.

ON CONSTRUCTING DESIGN KNOWLEDGE

The reflective cycle is considered to be a key element in the accumulation of design knowledge and is seen to be crucial to the interface of science and design (Argyris, 1992; Romme, 2003; Van Aken, 2004; Orlikowski, 2004). Conceptualizations of the reflective cycle go back to the work of Dewey (1933) and later to Kolb (1984) and Kolb et al. (1984) in which it is seen as a central mechanism in a process of experiential learning. These authors describe reflective thinking as a systematic way of understanding and

enacting problem situations, using previous experiences in consecutive instances. In the context of organizational design, reflective thinking is related to the generation and accumulation of valid and reliable knowledge that can be used as a guide in new design processes. The resulting design knowledge base contains technological rules that are both grounded in organization science and tested in the context of their application. The next sections discuss in greater detail the current views in the organizational design literature on: 1) the specific characteristics of this reflection process of DKD, and 2) the composition of a design knowledge base (see Figure 1).
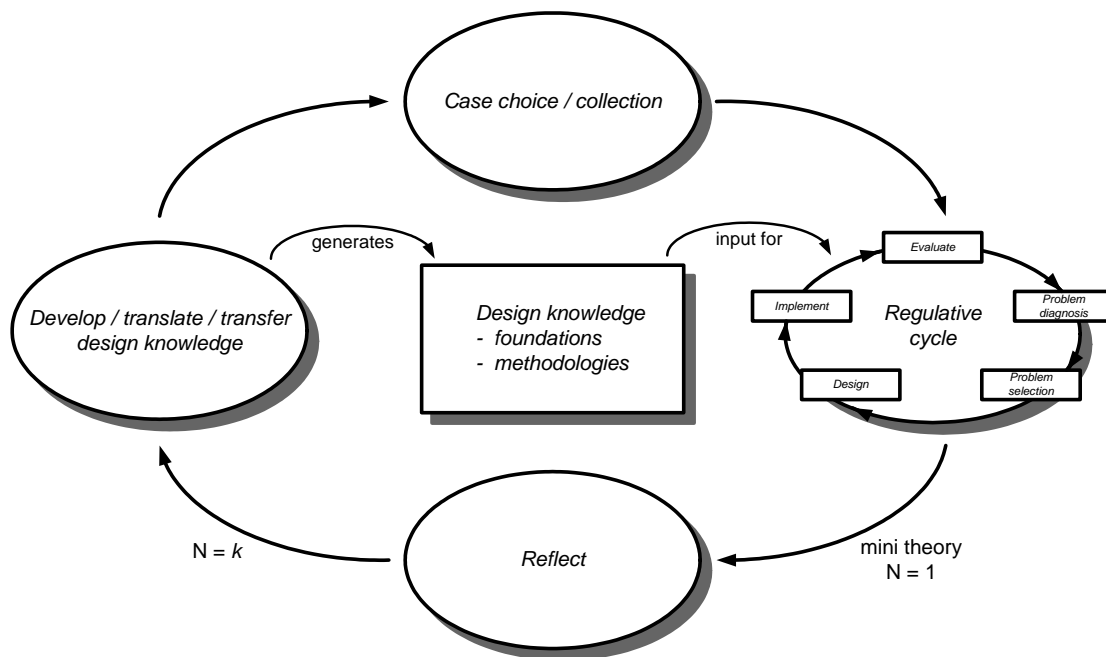

Figure 1

Reflection process

Following Dewey (1933), Kolb (1984), and Kolb et al. (1984), theorists of organizational design typically identify different phases in the process of reflective thinking (see Figure 1). According to Van Aken (2004), the reflective cycle of DKD commences by first concentrating on a specific domain of problem situations. In a number of selected cases these problems are addressed by systematically enacting reality on the basis of the 'regulative cycle' (Van Strien, 1986). In line with Simon's (1969) description of the

design process, this 'regulative cycle' involves a structured organizational problem solving process that is guided by grounded design rules (see also Suh, 1990; De Leeuw, 1996). In other words, designers are involved in pragmatic experimentation and sensemaking (Weick, 1995) where a unique situation is "understood through the attempt to change it" (Schön, 1983: 132). Key elements of this process are problem formulation, problem diagnosis, design, and implementation of the design, after which the effects are evaluated in the light of the initial problem formulation. The iterative search process continues until a satisfactory solution crystallizes "that works well for the specified class of problems" (Hevner et al, 2004: 89). Dewey emphasized that such phases "do not follow one another in a set order" (1933: 115); rather, in practice, some phases may be expanded, while others may be combined or even skipped.

The output of the regulative cycle entails a theory of practice or 'mini-theory' (Van Strien, 1997: 685) that is only applicable in the individual case (N=1). These organizational designs and interventions are studied by evaluating and classifying a number of selected and successful N=1 theories. In the scientific process of reflecting, these N=1 theories may be generalized to N=K theories. This means that, in line with basic assumptions of case study research (Yin, 1994), designers can derive more generalizable design rules by systematically reflecting on a number of idiosyncratic cases. The reflection process particularly concentrates on analyzing the effectiveness of the design knowledge in the original context by its initiator (alpha testing) or examining the rule by others beyond the point of origin (beta testing). Van Aken (2004) posited that through testing a technological rule by following a reflective cycle one can gain insight into indications and contra-indications for successful applications. In line with this, Hevner et al. postulated that performing these reflective activities enhances the ability to identify weaknesses in the theory or the artifact (2004: 80). As Dewey argued, a person who engages in reflective activity "learns as much from his failures as from his successes" (1933: 114). In this way, designers engage in 'learning from enactment' which may enhance their repertoire and ultimately change their future actions (Schön, 1983; Kolb, 1984; Weick, 1995; Orlikowski, 2004).

Knowledge base

Apart from the reflection process, theorists of organizational design have also provided important insights into the content, purpose and criteria of a design knowledge base. Current views of the reflective cycle of organizational design emphasize that the analyses of the performance of the selected cases may result in refining the present knowledge base. In this way, the present experiences, such as those related to the object to be designed or about the realization process, can become further enhanced. This continuous enhancement increases the possibility of being regarded as validated practice (Van Aken, 2004; Van Eijnatten and Hoevenaars, 1989; Van Strien, 1986; Hevner et al., 2004). In line with Simon (1969), it is argued that this knowledge base includes not only 'foundational theories' or 'organization science' but also provides explanations of organizational reality. A validated design knowledge base particularly also encompasses constellations of construction principles and more specific design rules (Hevner et al., 2004; Van Aken, 2004; Romme and Endenburg, 2006). These, what Hevner et al. refer to as "methodologies" (2004: 80), serve as 'boundary objects' that offer the possibility to relate science with design practice (Romme and Endenburg, 2006). When these rules become incorporated into a validated knowledge base, they can serve as input for new design cases, thereby providing an important basis for further knowledge development. In a 'new' problem situation, the enhanced repertoire allows for the development of a better informed variation of the 'old' by 'seeing-as' and 'doing-as' in previous situations (Schön, 1983). As Dewey (1933) argued, suggestions for further inquiry into the problem situation and possible solutions do not arise out of nothing, but are fed by past experiences.

Not just any prescription can become incorporated into a system of design knowledge; rather, it must be useful in terms of relevance and rigor. As Hevner et al postulated, in building a validated knowledge base "truth and utility are inseparable" (2004: 80). Baligh et al. (1996) proposed that developing a knowledge base that consists of a coherent set of design rules should be guided by several consistency criteria. Specifically, it has to be internally consistent, consistent with general theories, and usable for design purposes in the real world. To achieve this, Van Strien (1986) noted that what is essential for building a scientific practice of design is that knowledge products are open to control. In line with this notion, Van Aken (1994) stressed that a crucial criterion for

design knowledge is that it can be tested and verified, thereby assessing "unrecognized defenses" of the originator (2004: 234). At the same time, it is indicated that design heuristics in particular cannot be proved in a strict sense. Rather, by its application it should generate trust during the process of development (Van Aken, 2004).

LEGITIMACY IN DESIGN KNOWLEDGE DEVELOPMENT

The previous section showed that the current literature on organizational design shares a view in which the reflective cycle is considered to be central to DKD. In this cycle, successful interventions from the regulative cycle are generated, systematically reflected upon, and incorporated into a validated knowledge base which provides an important basis for improving future designs and design processes. In this section, we further explore the elements favorable to the development of design knowledge by drawing on an institutional perspective. By using this perspective, we seek to better understand the persistent problems inherent in the development of design knowledge into 'good currency.'

Gaining legitimacy

Institutional theorists have indicated that the possibilities for the development and establishment of ideas and practices are not only related to their inherent technical quality, but are related particularly to their legitimacy (Scott, 2001), that is, "a social judgment of acceptance" (Zimmerman and Zeitz, 2002: 414). Following the work of Suchman, ideas and practices are considered to be legitimate when they are "desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (1995: 574). It is argued that ideas and practices gain and maintain legitimacy when they conform to institutionalized patterns of thought and action, "regardless of their value for the internal functioning of organizations" (Tolbert and

Zucker, 1996: 26). In other words, although new knowledge may be considered validated, the seed still requires a fertile breeding ground to grow (Kimberly, 1981; Starbuck, 1992; Szulanski, 1996; Davenport and Prusak, 1998).

At the same time, studies of institutional processes persistently show that key activities related to developing new ideas and practices generally do not conform to the taken-for-granted patterns of thought and actions in various ways (Dougherty and Heller, 1994; Heusinkveld and Benders, 2005). More specifically, novelty easily violates existing practices or may be 'unthinkable' in the light of the institutionalized thought structure; thus, new ideas and practices can easily be considered to be 'illegitimate' (Dougherty and Heller, 1994: 202). In spite of their possible technical superiority, a lack of legitimacy poses a threat to the survival of DKD ventures as it limits their access to crucial resources (Scott, 2001; Suddaby and Greenwood, 2005; Kumar and Das, 2007). Institutional theorists suggest that, to become accepted and eventually considered taken-for-granted, the possibilities for the development of new ideas and practices are related to: 1) the institutional context in terms of institutional practices and discourse within which the development activities are located, and 2) the presence and efforts of institutional entrepreneurship that engage in explaining and justifying the development ventures to support their institutionalization.

Institutional context

Institutional theorists have traditionally emphasized that the legitimacy of ideas and practices relate to the specific (a) institutionalized practices and (b) institutionalized discourse within which these are constructed. First, institutional theorists argue that the "compatibility with the existing structure and culture of an organization" (Burns and Wholey, 1993: 133) is an important determinant of the legitimacy of new ideas and practices. The present institutional practices are relatively inert (Brunsson and Olsen, 1997; Scott, 2001) because of the "embeddedness of an organization within its institutional context" (Greenwood and Hinings, 1996: 1028). Given the difficulties in changing existing practices, theorists stress the importance of the compatibility with the institutionalized practices in an organization or specific field for new elements to become entrenched (Zeitz et al., 1999: 756). It is argued that new knowledge must include

characteristics that are already considered taken-for-granted practices or known to increase understanding and acceptance within a specific context (Cohen and Levinthal, 1990; Hargadon and Douglas, 2001). As Ortmann (1995) stressed, the 'old' is constitutive for what can be recognized as 'new.' To understand how different entities conform to institutionalized practices, institutional theorists increasingly point to the importance of its 'cognitive underpinnings' (Suddaby and Greenwood, 2005; George et al., 2006). The ability to develop new organizational design knowledge draws on, and is restricted by, the prior level of related knowledge that is acquired in past socializations and shapes people's cognitive and value system (Cohen and Levinthal, 1990; Reay et al., 2006). In other words, the recognition and retention of new knowledge development relates to the ability to understand it and the possibilities of making it part of daily routines (Nelson and Winter, 1982). As a result, an inability to understand DKD in terms of existing practices and routines is considered an important impediment to gaining legitimacy (Suchman, 1995).

Second, a fertile context for DKD is not only shaped by a development venture's fit with the prevailing practices but also by the opportunities to relate it to the existing discourse within a specific institutional field (Meyer and Rowan, 1977; Brunsson and Olsen, 1993; Furusten, 1995). The managerial discourse is a crucial element in the institutional environment, as it may provide legitimacy to specific ideas and practices (Furusten, 1995). As Berger and Luckmann emphasized: "the edifice of legitimation is built upon language and uses language as its principal instrumentality" (1966: 64). This means that DKD ventures enhance the possibility of becoming accepted in an institutional field when they are described in the prevailing "legitimated vocabularies" (Meyer and Rowan, 1977: 349). Being associated with such legitimate discourse does not necessarily lead to enhanced economic performance, but it does contribute to a favorable reputation of development ventures (Staw and Epstein, 2000). A complicating factor is that the legitimacy of a specific discourse is limited in time (Stjernberg and Philips, 1993; Abrahamson, 1997). After a period of excitement, popular labels may become worn-out through use and lose their initial image of rationality and progress (Zbaracki, 1998; Benders and Van Veen, 2001). Being associated with worn-out discourse decreases the possibilities for DKD ventures to gain legitimacy. For instance, Benders (1999) and

Benders and Verlaar (2003) showed how the worn-out language of the prevailing organizational design approach became an important barrier to gain support and resources from internal and external stakeholders.

Institutional entrepreneurship

More recently, institutional theorists have focused on the role institutional entrepreneurship as an important component in the institutionalization of new ideas and practices (DiMaggio, 1988; Munir and Phillips, 2005). As an exponent of the recent interest in the role of agency in institutional theory, research increasingly shows how, next to the prevailing discourse and practices, the legitimation and institutionalization of work practices in organizations may occur through the "purposeful continual actions of determined individuals" (Reay et al, 2006: 993; see also Stjernberg and Philips, 1993). It indicates that such "agents of legitimacy" (Dacin et al., 2002) are deeply involved people who have the interest and resources for supporting the development of new ideas and practices and engaging in actions that legitimate these ventures in a specific institutional context. This relates to the wider accepted notion that a key element driving innovative activities in this is the presence of a "champion" (Chakrabarti, 1974; Rogers, 1995), "soul-of-fire" (Stjernberg and Philips, 1993), or "chief knowledge officer" (Davenport and Prusak, 1998). An absence of, or difficulties in, institutional entrepreneurship may significantly obstruct the legitimacy and ultimately impede the development process of organizational design knowledge (Stjernberg and Philips, 1993) because, to use Van de Ven's terms: "an innovative idea without a champion gets nowhere" (1986: 592).

Theorists see the presence of such 'institutional entrepreneurs' as a necessary condition for an institutionalization project, but its successfulness in gaining legitimacy depends on their social skills (Fligstein, 1997). To realize their own highly valued interests (DiMaggio, 1988), these entrepreneurs have to recognize and account for the interests of other people: "the basis for social skills is the ability to relate to the situation of the other" (Fligstein, 1997: 398). The development of new ideas and practices has to be appreciated and enacted by other actors to become regarded as established. Following Fligstein (1997), the social skills of institutional entrepreneurs includes the ability to develop an understanding of the specific field, and using this as a basis for "strategic

action" (1997: 398) that convinces others of the value of new ideas and practices. For instance, various studies have showed how entrepreneurs use their embeddedness and related understanding of their institutional context to gain acceptance and support for the design approach among their peers and senior management (Stjernberg and Philips, 1993; Heusinkveld and Benders; 2005; Reay et al., 2006).

A key element in increasing the receptiveness of people to DKD relates to the entrepreneur's persuasive activities in which (s)he seeks to shape the meaning and identities within a specific social group. Rhetoric is considered an important resource for 'theorizing' the desirability and appropriateness of DKD and then gaining resources and support for it (Scott, 2001; Munir and Phillips, 2005; Suddaby and Greenwood, 2005). As Suchman emphasized: "legitimacy management rests heavily on communication" (1995: 586). Such promotional efforts may entail drawing on discursive strategies that socially construct new ideas to become accepted and taken for granted, and also represents competing practices as less appropriate (Tolbert and Zucker, 1996; Suddaby and Greenwood, 2005; Heusinkveld and Benders, 2005). In addition, when there is doubt about the value of design knowledge, the legitimacy for development ventures that occur under that banner likely erodes, which may lead to abandonment (Oliver, 1992; Burns and Wholey, 1993). Or as Kimberly phrases it: "An adopted innovation may not perform well enough to justify its continued use" (1981: 92). Counteracting the emergence of possible critical voices and resistance by opposing groups requires continued promotion about the benefits of a knowledge development venture to the actors involved (Tolbert and Zucker, 1996; Heusinkveld and Benders, 2005). This entails accumulating and promoting noticeable achievements or 'small wins' (Reay et al., 2006) of DKD ventures, thereby creating a prospect of success for the people involved.

A CASE OF KNOWLEDGE DEVELOPMENT IN DESIGN PRAXIS

To illustrate how legitimacy issues play a crucial role in the development of design knowledge, we discuss the case of a DKD venture, Product-Based Design (PBD) (Reijers et al., 2003). In this section we draw from rich sources of material to describe the

initiation, development, and consequent stagnation of PBD. This material consists of about 100 e-mails, presentations and various documents concerning the PBD method, such as commercial client offerings, reports of assignments, and internal project proposals. The description is also based on participant observations and iterative rounds of sense making of the second author during the development process. The role of an integral and active participant allowed for all DKD activities to be accessible. It also provided important possibilities of revealing key elements in the way DKD is experienced, an area which has been unexplored in the literature. In addition, we held ex-post interviews in 2004 with the four most involved developers and practitioners. These were transcribed and authorized by the interviewees. In the case description, we particularly focus on the problems that were encountered by the designers in legitimizing their design approach after its initial successful applications.

Constructing a piece of design knowledge

PBD is a design methodology that can be used to develop efficient designs for highly information-intensive business processes, as they are typically found in the service industry. One can think of, for example, business processes that are in place within banks to deal with the applications for mortgages or the evaluation procedures that are carried out within governmental agencies to process requests for social benefits. The main feature of the design methodology is that it strictly focuses on the required core information that needs to be processed to produce a certain outcome, typically a decision of some kind. As such, it completely ignores secondary, and perhaps costly activities, that may be present in existing versions of the process.

Once identified, the essential pieces of information and their interrelationships can be used within PBD to mathematically derive an optimal lay-out of processing steps, for example, to minimize the effort that needs to be spent on carrying out the various steps. The PBD approach is conceptually analogous to the use of a Bill-of-Material for a physical product (for instance, a wafer stepping machine or a bicycle) to infer the necessary steps for their assembly in a manufacturing setting (Orlicky, 1972; Buffa and Sarin, 1987).

The PBD methodology has been a co-production between Eindhoven University of Technology (EUT) and the Dutch branch of one of the world's largest accounting and consultancy firms. PBD's origins date back to 1997 when the first initial ideas were put to paper by the chairman of the consultancy firm's board, who at the time was also a part-time professor of EUT. It occurred to him that in the manufacturing domain a vast body of process design knowledge existed, which potentially could be translated to the field of service organizations. This insight led to the publication of PBD's first conceptual elaborations (Van der Aalst, 1999; Van der Aalst et al., 2001), followed by successive applications of the methodology within a social security agency, a large bank, and a municipality in the years 2000, 2001, and 2002. All these applications were systematically reflected upon, and the accumulated knowledge has been drawn upon in subsequent designs (see Reijers, 2002 and Reijers, 2003 for detailed case descriptions).

Each of the applications of PBD led to a design of an improved process plan that was subsequently fully implemented within the respective organizations; this in itself is remarkable, given the high rate of prematurely aborted redesign projects in practice. Without exception, each of these applications also yielded significant benefits for the stakeholders involved, for instance, by reducing average lead times of the processes by 30-70% and by reducing average service times by 60-80%. At the same time, each successive reflection on its application led to a sharper insight into how PBD could be applied most effectively. For example, the Bill-Of-Material-like diagrams that were suitable to represent the exact information for the process lay-out derivation were less suitable as a communication means to interact with stakeholders, and a solution was found with early prototyping (De Crom and Reijers, 2001). The updated and matured methodology was subsequently published in one of the top scientific journals in the Information Systems field (Reijers et al., 2003).

Even though PBD was implemented and invariably led to significant benefits for the organizations in question, repeated executions of the reflective cycle did not result in gaining 'good currency' for the DKD venture and its underlying design method. In spite of PBD's technical performance, the DKD efforts decreased which eventually tarnished the viability of the design knowledge, as can be noted from the limited use of this design method in recent projects. Rather than becoming further institutionalized, the

development of this design methodology has 'quietly died.' In the remainder of this section we address in greater detail the *institutional context* in which PBD was developed and applied, as well as the *institutional entrepreneurship* related to it. By discussing both aspects, we argue how the legitimacy for PBD as a DKD venture and valid piece of design knowledge was considered to be problematic.

Impact of the institutional context

In the time period that spans the development of PBD and its first practical applications, business process design for service organizations had already been part of the consultancy offerings for quite some time. The existing and well-entrenched (Zeitz et al., 1999) approach to process design within this particular consultancy is characterized by one of the interviewees as follows:

"… process design for organizations is carried out in such a way that a number of people are put together in a room. A workshop is being held and one hopes that something meaningful emerges from it." (designer 4)

In this rather evolutionary approach, which at the time that PBD emerged was widely institutionalized in the practice of process redesign (Stoddard and Jarvenpaa, 1995; Sharp and McDermott, 2001), designers heavily relied on the knowledge and expertise of people involved in the *current* process to identify weaknesses and to generate improvement opportunities towards an improved design. But this participatory approach has its disadvantages, as noted in the literature (for an overview, see Reijers, 2003) and expressed by the interviewees:

"… you will take as starting point how people who have intimate knowledge about a process think about that process. But then you assume that what is already in place is essential, although the work that is being done is often not necessary at all and is open to a completely different plan." (designer 1)

"All those people who sit there [in a workshop] are biased and therefore prejudiced. They want something in the process design because they always did it like that anyway or because it appeals to them for another reason." (designer 4)

In contrast, to the institutionalized process redesign practices, PBD does not take the starting situation into account. Instead, it derives an ideal process design from the characteristics of the product it is intended to produce. In this way, PBD aims for a more 'objective' and 'rational' approach to process design, highly similar to engineering approaches found in the manufacturing domain.

The analysis of our material suggests that the contrast between the institutionalized methodologies already in place and the characteristics of PBD was perceived to be an important barrier to a wide adoption after its initial applications of this new piece of design knowledge within the consultancy firm. Management consultants can be roughly divided into *experts*, who deliver content knowledge, and *facilitators*, who guide groups of people through a change process (Markus and Benjamin, 1996). The vast majority of consultants within the firm had experience in the latter role. As one of the interviewees noted with respect to the role in designing processes:

"For the facilitating approach, you will need very few new methods and techniques. Most of the existing ones were already there some 30 years ago. Once in a while, you will need to move with the times by organizing your games differently, applying some modern technology, and do some relabeling. But you can keep on doing the same things." (designer 1)

Most consultants within the firm had intimate knowledge of creativity techniques such as out-of-box-thinking, affinity diagramming, and brainstorming. PBD was considered to be a way of working that did not fit their process redesign routines. As a result, the engineering approach of PBD was perceived as being too difficult to be familiar with *despite* its obvious advantages. One of the interviewees characterized this as follows:

"The big advantage of PBD was that in contrast to other approaches – which are usually highly subjective – it was just a good, objective way of designing and redesigning processes. The disadvantage was that it was perceived as a difficult product: That it would not be very easy to apply." (designer 3)

Also, the fit with the contemporary legitimate discourse was perceived by the designers to be an important barrier to the possibilities for PBD's further development. The end users clearly linked the PBD method with the concept of Business Process Reengineering (BPR), a management concept coined at the start of the 1990s in publications by authors such as Michael Hammer (Hammer and Champy, 1993). Earlier research into the diffusion of this concept in the Netherlands shows a bell-shaped pattern of both scholarly and professional publications with a maximum in the mid nineties (Heusinkveld and Benders, 2001). Even when taken into consideration, the time lag of some 3 years between the managerial debate on BPR and the academic discourse that followed, it is clear that by 2000/2001 the BPR 'hype' was over its top. The general association of PBD with 'worn-out' discourse was considered to be an important obstruction in acquiring social acceptance among users and designers. Indeed, as one of our interviewees describes the missed window of opportunity for PBD (designer 2):

".. it was an important aspect that the [BPR] concept in the market had passed the hype, although only then we understood how to properly apply PBD."

In summary, despite PBD's proven advantages and ties with design practices in other domains, in the setting of our case the designers experienced important barriers in the further development of a 'new' design method. First of all, the method was considered a way of working that did not fit with the institutionalized practices and, as a result, was too difficult to absorb (Cohen and Levinthal, 1990) for the majority of its target audience, the consultants of the involved firm. Second, in the minds of the prospective end-users, it was associated with a discourse that had already lost its glamour and urgency. Both aspects clearly point to an unfavorable institutional context for DKD.

Impact of institutional entrepreneurship

The efforts of some dedicated people to construct and propagate PBD within the firm were also important in the legitimacy of the DKD venture. Clearly, the initial deviser and champion of PBD played a key role. His position as both chairman of the firm's board and academic professorship enabled him to identify a knowledge gap as well as stimulate and guide the development of a piece of design knowledge. Moreover, these positions provided access to a network of opportunities for the method to be applied in client settings.

In addition, after the first large-scale applications of PBD, a working group of consultants assembled itself to disseminate this piece of design knowledge within the firm and professionalize the PBD offering. One of the interviewees, who participated in this group, explains the group's purpose as follows:

"The working group was an initiative of a number of people well disposed towards PBD. Knowledge and experiences in this field were fragmented and applied at different places. The idea was to neatly document it all so that we could produce brochures and flyers for our clients, to explain them what PBD is. […] We also wanted to inform the other groups within the firm about PBD." (designer 4)

The group put various efforts into the development of supporting materials for PBD and its promotion within the firm, both nationally and internationally. Specifically, articles on PBD appeared in the consultancy's internal publications, public performances on the methodology were given to the various other groups, and training material was developed to instruct consultants on the use and application of PBD. This promotional material sought to explain the specific steps in the methodology and emphasized the potential technical performance of PBD. The immediate supervisors of the group members approved of these activities, on the one hand, but, on the other, did not grant time or funds for further substantial activities such as the development of software to support PBD. Work group activities therefore remained limited to the free time of its members. After a while, the lack of support caused considerable discontent among the working group members, as can be seen from one of the e-mails we had access to:

"There is not the progress with PBD as we would have liked. 'X' and I are still working on a new brochure but we did not receive the go-ahead for all the other things we have thought of (prototype, check list, etc.). I was forced to provide yet-another-list of clients who would potentially be interested in the method ..." (e-mail May 3rd, 2001 to working group members)

From all our sources, the picture emerges that the operational management was highly reluctant to provide support and resources to a full-fledged professionalization of the PBD offering. Only as long as BPD's development efforts were related to financial benefits, was there room for further DKD. This was confirmed by one of the interviewees:

"With my group, the first priority is to carry out paid work for clients, the second is to write new tenders, and priority three is knowledge development." (designer 4)

Noteworthy is how this remark clearly hints at the relevancy of adapting to practical routines and criteria in introducing and sustaining new design knowledge. PBD's promotional efforts mainly focused on its technical performance rather than the present institutionalized logic of financial benefits.

New developments with respect to PBD did take place on a very small scale, but also this came to a complete stop when its initiator and champion in the board moved to academia for a full-time position. With this move, the political support for the development of PBD completely disappeared from the firm. Our analysis of internal memos and e-mails in this period indicates that from that moment on the firm's operational management started to demand more evidence on the financial benefits of PBD when requested to support its further development and dissemination. After some time, the working group ceased to exist with several of its original members leaving the firm. This effectively extinguished the microprocesses at work to gain legitimacy for PBD within the firm. Some traces of PBD still remained, for instance in accepted offerings under contemporary legitimate labels such as 'STP' and 'Operational

Excellence'. However, both the lack of fit with the institutionalized discourse and practices, as well as a lack of entrepreneurship, significantly decreased the possibilities for systematic DKD.

DISCUSSION AND CONCLUSION

Drawing on an institutional perspective, we sought to better understand the problems inherent in the development of design knowledge ventures, an issue that has received scant attention in current organizational design literature. The discussion of legitimacy in DKD offered a theoretical framework for reflecting on a case of the evolution of a piece of design knowledge, PBD, in which practitioners collaborate with researchers to construct and establish a validated body of design rules. Specifically, the case illustrates how the insights from institutional research can be used to understand impediments to the development of design knowledge and develop guidelines for future development ventures.

As demonstrated in the previous section, PBD as a piece of design knowledge was constructed by drawing on 'foundational theories' from other domains, translating these to a new domain, and by pragmatic experimentation in praxis developed into a validated practice. The design method generated considerable rewards for companies that applied it to redesign their business processes. Iterative rounds of reflection significantly increased the technical performance of this piece of design knowledge. However, the current state of PBD is that the development of this design methodology has 'quietly died.' Although PBD is considered to be a proven and effective method, the efforts related to the PBD venture have ceased, thereby impeding the possibilities for further DKD. Because PBD, as a design approach, differed significantly from regular, institutionalized approaches, designers experienced important difficulties in the comprehension of the ideas, which eventually impeded its further development. In addition, we saw in the case of PBD that the absence of a champion and people supporting these efforts was crucial in the (lack of) possibilities for further development of this design methodology.

Our analysis reveals how the development of design knowledge may encounter substantial barriers. More specifically, it signifies that development ventures are likely to experience important struggles in building a cumulative knowledge base and gaining acceptance to design rules *in spite* of the fact that these are grounded in scientific research and are successfully tested in organizational praxis. As we have seen in the analysis, despite its proven, beneficial, technical performance of the design method, the PBD venture did not get sufficient access to support and resources. Hence, grounded design rules that are constructed by following the reflective cycle of organizational design are not necessarily recognized, accepted and widely drawn upon in organizational praxis, an issue that will ultimately affect their further development possibilities. This means that, although a specific piece of design knowledge is validated in praxis by iterative rounds of reflection, it may not be readily further developed by other designers or organizations. As a result, DKD is not simply constructing a validated knowledge base but should be regarded as a process that meets with considerable legitimacy barriers, potentially inhibiting the establishment and viability of organizational design rules.

Theoretical implications

Our findings contribute to the organizational design literature by showing the importance of gaining legitimacy in DKD, an element that has not been systematically explored previously. In addition to concentrating on increasing the technical performance, we argue in this paper that is also essential to understand DKD as a social activity in which novelty has to gain 'good currency' in order to become interwoven with the established thoughts and actions (Berger and Luckmann, 1966; Van de Ven, 1986; Tolbert and Zucker, 1996; Hargadon and Douglas, 2001). The prior literature on organizational design noted a number of important elements related to: 1) the development process and 2) the contents of building a valid design knowledge base.

First, with regard to the knowledge development process, our findings indicate that, unlike other models, this process will likely be enhanced when adequate institutional entrepreneurship is included in the reflection process. Results show that insufficient efforts of competent people to construct and propagate new design knowledge is likely detrimental to a development venture's legitimacy, a resource that is crucial to remain

viable. Therefore, linking the steps in the reflective process to the presence of committed actors and suitable persuasive activities encourages the process of developing design knowledge. Also, a development process that meets the measures of the prevailing institutional (knowledge development) practices increases the likelihood of gaining 'good currency.'

Second, considering the contents of a design knowledge base, we conclude that a development venture may increase the possibilities of acquiring legitimacy when reflection activities also concentrate on how the contents of the venture's knowledge base may fit the institutional context in which the development activities are located. Our case study shows how a lack of fit between the knowledge base of a development venture and the relevant institutionalized discourse and practices may inhibit the possibilities to acquire legitimacy, thereby obstructing a viable DKD process.

These conclusions have important implications for understanding the evolution of other design approaches. Our findings imply that the 'successfulness' of a piece of organizational design knowledge relates not only to its technical performance but also to its social acceptance. The framework presented in this paper provides some valuable possibilities for further understanding the degree of social acceptance of design approaches in specific times and contexts. For instance, although Socio-Technology is generally regarded as a well-grounded design theory with foundations in the late 1940s (see Trist and Bamforth, 1951; Trist, 1981), its lack of widespread diffusion, and the resultant lack of opportunities for are often attributed to its vocabulary that is not particularly attuned to the general managerial discourse (Van Eijnatten and Van der Zwaan, 1998; Benders et al., 2000).

Drawing from our own framework, we would argue that the design approach of Circular Organizing would never have been developed without the receptive context that allowed 'experimenting', and the substantial efforts of its champion, Gerard Endenburg, who put a lot of effort into constructing a coherent set of design rules and legitimizing its development (Romme and Endenburg, 2006). In line with this, discussing the achievements of seven major design approaches, Van de Ven and Joyce (1981: 4) noted that each of these "represents a significant commitment of time and resources by groups of researchers toward the development and evaluation of a basic set of ideas." As a

notable example of the role of entrepreneurship, historical studies indicate that the efforts of engineering professionals were crucial in the construction and legitimation of the ideas associated with Systematic Management and Scientific Management (Litterer, 1961, 1963). Having their origin in mechanical engineering, these design ideas were translated to organizations and propagated as a solution for contemporary organizational and societal problems, particularly by the substantial efforts of members of this professional group (Nelson, 1975; Shenhav, 1999). Our framework also provides some clues for reflection on the prevalence of contemporary design approaches such as Quality Management or Lean Production. Both approaches have been, arguably, gradually institutionalized in praxis (Cole, 1999, Benders and Van Bijsterveld, 2000). But what can we say about the extent to which, and the way in which, these design approaches have become entrenched? These issues constitute fruitful areas for further research into DKD.

The institutional framework presented in this paper not only provides an enhanced viewpoint to reflect on other cases of DKD but also signifies the importance of more systematic research on organizing the development of design knowledge. Studying DKD remains a complex and difficult endeavor, and our study can be considered only a first step into this area. Future research should not solely focus on 'success stories.' The danger of such 'reified' views is that they unavoidably tend to conceptualize knowledge development and accumulation as a harmonious process, which does not reveal the struggles that are inherent in the development of design knowledge. This offers only a limited understanding of how a venture becomes a success in terms of opportunities for DKD. We believe that a fuller understanding of the DKD process can be realized by drawing on systematic historical analyses such as, for instance, the studies of Shenhav (1995; 1999) or Benders and Stjernberg (2002). But also cross-comparative case study approaches such as Cole (1985) or Guillén (1994), indicating how different constellations of institutional factors can generate different outcomes in terms of DKD, can generate new insights for the organizational design literature. In addition, putting more emphasis on the role of relevant actors and the different ways in which they seek to gain legitimacy for their knowledge development efforts is, in our view, a valuable albeit largely unexplored field in understanding and enhancing the knowledge development and

enactment processes in theoretical treatments of the reflective cycle and the interface of science and design.

Practical implications

Our discussion emphasizes that the presence of validated technological rules does not guarantee that design knowledge will be used and further enhanced. Rather, many design approaches may be initiated but, due to a lack of legitimacy, they are limited in further development possibilities (see, for example, Benders and Stjernberg, 2000). This is a situation which is not only significantly at odds with the academic dictum of knowledge accumulation but has important implications for organizational praxis (Lammers, 1988; Benders and Vermeulen, 2002). A lack of knowledge development possibilities creates a constant discontinuity which increases the likelihood that organizations and practitioners continue making the same elementary design mistakes. For this reason, the science of design goes well beyond the task of constructing a coherent constellation of technological rules. A more fundamental challenge lies in providing robust guidelines for acquiring legitimacy in DKD to increase the possibilities for a viable cumulative design knowledge base in praxis.

Organizational design can only make a difference (Romme, 2003) and play a role in addressing the persistent barriers between academia and management praxis (Duncan, 1974; Kieser, 2002) when it acknowledges the significant barriers in knowledge development and when it also seeks to address these. This means that generating legitimacy should play an important role in current practices of DKD. A new iteration of the reflective cycle of organizational design towards N=2, should involve not only a *technical reflection* on the contents and technical performance of the design knowledge, but also an *institutional reflection*. Such an institutional reflection entails that designers devote time and energy in understanding the institutional context within which development ventures are situated, and then use this knowledge as a basis for legitimizing their new development ventures. This requires a proper analysis of the present situation in which designers seek to embed their development activities. In addition, next to a technical validation of design rules, designers should put a significant amount of effort into propagating them as part of established practices or seek to modify existing

institutionalized discourse and practices to include their design approaches (see for example Munir and Phillips, 2005).

As been argued in the above, these are important ingredients for a DKD venture to gain and maintain 'good currency.' In this way, the wheel is not constantly reinvented in praxis and offers a basis for professional schools to teach a science of design. These insights can be included in their curricula as part of a long-term awareness effort. The population of students that is able to recognize the legitimacy problems may then constitute an *ideological force* (Lammers & Széll, 1989) and play a role in ensuring that the insights on gaining 'good currency' or DKD ventures becomes generally accepted in praxis. These guidelines derived from our research provide some useful clues to the question of whether the reflective cycle's output 'will work,' and may contribute to creating a viable knowledge development process in design praxis.

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