Communities for Innovation as Enablers of Cyclical Ambidexterity in SMEs

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Abstract: Organizational ambidexterity still remains ambiguous in terms of the concept and vague in terms of feasible realizations, especially for SMEs. We analyze recent classifications of the concept and focus on cyclical ambidexterity as the appropriate means for SMEs to manage the tension between incremental and discontinuous innovation effectively. We argue that cyclical ambidexterity should be understood as a sequence and interplay of quality management processes and internal communities for open innovation. By applying the methodological approach of action research, we investigate an implementation of such an approach to cyclical ambidexterity at Hofmann Personal. The findings confirm our framework of social and technological design elements of internal communities for open innovation.

1 Introduction

Nowadays, companies face an increasingly dynamic environment characterized by hyper competition in a global economy, more and more unpredictable behavioral patterns of individuals and whole societies, and shorter product life cycles [SS10]. As a result, competitive conditions of companies become more turbulent, making it more difficult to sustain competitive advantages [WR05]. In such environmental settings, innovative activities are crucial for sustainable corporate success [RN01]. Extant scholars on organizational innovation have intensively discussed two facets of innovative activities of companies: organizational ambidexterity and open innovation activities.

Ambidexterity refers to organizational capabilities of both "exploiting existing competencies as well as exploring new opportunities" [CGZ09:781]. In the context of innovation, ambidexterity can be understood as the stress area of incremental and discontinuous innovation [AL09]. Some scholars argue that structural [RS08] or temporal [SL03] separation of both innovation forms as well as appropriate re-integration of exploration and exploitation activities [Ja09] are promising means for organizations to be successful. In this paper, we focus on temporal cycling between

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phases of incremental and discontinuous innovation in small and medium sized enterprises (SMEs). Due to their size and resource limitations, we consider temporal cycling especially an appropriate means for these companies [Si09].

In particular, we refer to the open innovation literature [Ch03] [FB05] to examine how open innovation communities allow companies to temporarily depart from paths of exploitation and engage in exploration activities. The arguments of open innovation proponents are closely related to studies on organizational ambidexterity that stress the importance of external knowledge and resources in innovation processes [RN01]. For example, [NBM09] emphasize the contributions and roles of core inside innovators, peripheral inside innovators and outside innovators in open innovation processes.

Following the methodological tradition of action research [Bl55] [Le47], we study how Hofmann Personal, a German medium-sized service company, engages in cyclical ambidexterity. In particular, we examine how the temporal establishment of an internal community for open innovation in combination with incorporated quality management processes enabled Hofmann Personal to cycle through phases of incremental and discontinuous innovation. We further identify important issues concerning the management of temporal communities for open innovation. The identified issues relate both to the project management itself as well as to surrounding activities pre, contemporaneous, and post to the project. We also find that the issues of managing temporal open innovation activities are characterized by an intensive interplay between socio- and technological design elements. In order to organize temporal innovation communities efficiently, companies need to facilitate social interaction and collaboration within these communities by means of appropriate information and communication technology.

This article is organized in six sections. In the next section, we review the literature on organizational ambidexterity with a specific focus on SMEs. In the third section, we conceptualize the interplay of quality management processes and internal communities for open innovation as a means for cyclical ambidexterity. The fourth section presents a framework of critical design issues for embedding internal communities for open innovation. In the fifth section, we present a case study to test the framework presented. Finally, we close with a discussion of our findings.

2 Enabling Ambidexterity in SMEs

The notion of ambidexterity is widely used in the literature to describe organizations that are capable of both pursuing exploring and exploiting activities at the same time [Si09]. Based on the seminal article of [Ma91], the concept has been interpreted in various conceptualizations, such as flexibility and efficiency [AGL99], exploitative and explorative learning [KS09], or search and stability [RS03]. Although there is considerable ambiguity in the literature regarding the construct itself [SS10], most scholars agree on the fact that the ambidexterity paradigm gains importance as organizations need to adapt to an increase in environmental dynamics throughout last decades [SS10].

Consequently, [SS10] consider the pursuit of ambidexterity as an organizational attempt to overcome the duality of stability and flexibility. In this context, stability cannot be understood in terms of cessation – stability rather means that an organization and its members possess the routines for sufficiently mastering new challenges and thereby foster incremental change [Fe00]. Thus, putting oneself into the shoes of a manager, the question of ambidexterity boils down to: When is continuous, incremental innovation sufficient and when is it necessary to trigger more radical and discontinuous innovation in order to survive and prosper? According to this observation, we argue together with others (e.g., [ST05] [AL09]) that the ambidexterity phenomenon should be considered as the stress field between incremental and discontinuous innovation.

One important theme in the recent literature on ambidexterity is the classification of a plethora of understandings of the construct as well as the identification of core paradoxes or tensions. For example, [Ra09] identify four fields of tension: the duality of differentiation and integration, the individual and organizational perspective, a static vs. a dynamic view, and internalization or externalization through establishment of alliances. Similarly, [AL09] suggest to use integration and differentiation tactics in order to balance the paradoxes in the fields of strategic intent (profit/breakthrough), customer orientation (tight-/loose coupling), and personal drivers (discipline/passion). Finally, [Si09] identify a structural (Where is ambidexterity pursued?) and a temporal dimension (How is ambidexterity pursued?) of ambidexterity in their literature review. Building on these dimensions, they identify four basic types of ambidexterity. If only one single unit is involved, they distinguish in harmonic (simultaneous) and cyclical (sequential) approaches. If ambidexterity is created across different units, they distinguish partitional (simultaneously) and reciprocal (sequential) approaches. The classification presented by [Si09] integrates the paradox of differentiation and integration [AL09] as well as the static vs. dynamic perspective [Ra09]. We will use this classification in the following as it also seems to be best suited for deriving insights from an organizational design perspective.

Typically, scholars of organizational ambidexterity report examples and case studies of big corporations like Cisco, US Today, or 3M [GP09] [OT04] [SS10]. With a few exceptions (e.g., [Lu06], [CD07] or [CGZ09]), particular situations and needs of SMEs are hardly under research. According to the Commission of the European Union, SMEs can be identified by their number of employees and their annual turnover. These attributes are connected to various characteristics of SMEs which allow for skepticism whether the same ambidexterity concepts can be applied to big corporations and to SMEs.

Generally, larger firms and SMEs face similar competitive situations and need to pursuit incremental and discontinuous innovation at the same time. However, the organizational design which supports or hinders the attainment of ambidexterity differs. SMEs have less resources and organizational slack to manage contradictory demands in separated business units focusing entirely either on explorative or exploitative activities. Moreover, SMEs have fewer hierarchical levels and are often under a strong influence of the founder or owner [Lu06]. Both aspects imply that the degree to which managers are involved in the creation of ambidexterity as well as the degree to which contradictory

behaviors are efficient or possible in SMEs differ strongly from situations in bigger corporations.

We argue that the particular characteristics of SMEs and their high importance for the economy as a whole require a closer observation of how ambidexterity can be enabled in SMEs[1]. Especially, we are interested in ways to enable ambidexterity in SMEs. With respect to organizational size, [Si09] provide some important insights for the understanding of their classification: "[…] we refer to the second dimension as structural because it captures whether or not ambidexterity is realized within an independent organizational unit (e.g., a business unit or a small to medium-sized firm (SME))" [Si09:868]. In their argument, they highlight the effect of resource limitations of SMEs that hardly allow for parallel, contradictory inner-organizational structures. Additionally, sophisticated alliance management or outsourcing practices which could be used to create ambidexterity through the organizational network are normally attributes of bigger corporations. Focusing on ambidexterity in independent units, cyclical or harmonic approaches remain for enabling ambidexterity in SMEs. Both approaches rely on the same individuals for incremental and discontinuous innovation activities [GB04]. [Si09] note that the focus on a single unit intensifies "[…] tradeoffs between exploitation and exploration [and] is generally viewed as more severe and restrictive […] thereby reinforcing the notion of bi-polarity." [Si09:868].

Harmonic approaches, i.e., simultaneous ambidexterity in one unit, are influenced by the design of systems, processes, and beliefs that are embedded in individuals' behavior [GB04]. Other authors name these influence factors organizational culture and context [GB94]. Most SMEs are optimized towards exploiting existing services and products by incrementally changing them towards market needs. The establishment of (discontinuous) innovation spaces (e.g., free time to innovate or accessibility of particular workshops/studios) as they are known from big corporations (3M, Google) can hardly be realized in SMEs due to resource restrictions. However, in some SMEs the entrepreneurial influence of the owner or founder of the business got adopted by the employees and is facilitated by organizational processes [Sc83]. In these cases harmonic ambidexterity could be asserted. Nonetheless, most SMEs appear to be rather exploitation-driven and lack the cultural and contextual antecedents for ambidexterity. Additionally, enforcing and changing culture is hardly possible and demand a longer process in organizations. As most SMEs show hierarchical structures which can be characterized by centralized decision rights on the top management level[2], the creation of cyclical ambidexterity seems to be the most fruitful approach to enable ambidexterity in SMEs. In the following, we argue that the combination of the concept of countervailing processes as well as the sequential pursuit of quality management processes and open innovation instruments perfectly suit the needs and situations of SMEs in their endeavors for creating ambidexterity.

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1 In accordance with [Lu06], we define an SME by the number of people employed (20 to 500 individuals) and the age of the organization (considerably older than start-ups). The floor number and the age restrictions are introduced as micro businesses and start-ups often operate on ad-hoc basis, thus, face different organizational challenges in the context of ambidexterity.

2 This is contradictory to the requirements for ambidexterity as stated by [GB04].

3 Open Innovation Instruments as Means for Cyclical Ambidexterity

The trade-off between "exploiting current competencies" and "developing new knowledge" [LM93:95] is addressed in the typology of [Si09] not only by structural separation but also by temporal cycles of incremental and discontinuous innovation activities. "Cycling" implies that ambidexterity is created through sequential alternation of long periods of exploitation and short bursts of exploration [GSS06] [Si09]. Ideally, the switching mechanism between the two modes of operation needs to be integrated in the systems and processes of the organization. A merely reactive approach, i.e., switching towards a discontinuous innovation mode (exploration) in case of extreme failures of products or substantial organizational threats cannot be considered as cyclical ambidexterity. Instead, a more proactive approach is needed. Proactive cycling may prevent two organizational risks. First, [Si09] highlight that one of the antecedents and reasons for pursuing cyclical ambidexterity is a strong technological orientation. With respect to the S-shaped concept of technological developments and capacity, this means that proactive cycling enables an organization to recognize and address new technology leaps early enough. Second, proactive cycling keeps organizations from succumbing to the "Icarus paradox" [Mi93] [Mi94]. The Icarus paradox describes that longer phases of success of products, services or routines in organizations lead to (over)simplifications in operations which result in resistance and blindness towards relevant feedback and signals [SS10]. Thus, temporal cycling prevents SMEs from technological as well as from organizational/social rigidities.

Although theoretically the positive aspects of cyclical ambidexterity seem to be plausible and clear, the vital question is: How can SMEs make use of this concept? Simsek and colleagues state that the implementation of this concept involves "[…] changes in formal structure and routines, practices and procedures, styles and systems of reward and control, and resource allocation. It further involves establishing mechanisms for managing conflict, maintaining effective interpersonal relations, and the development of switching rules" [Si09:883]. In their search for overcoming the contradictory challenges of stability and flexibility as well as for flexible organizational forms, [SS10] consider balancing of countervailing processes a valuable concept.[3] They highlight that the activity of organizing is a selective task and that switching to forms of full flexibility is not an option. Instead they opt for the integration of observation and reflexivity into the organization [SS10]. Furthermore, [SS10] suggest implementing a second-order function that safeguards the dynamics of the organization. In the context of sequential activities, this second-order function could be the determination of the demanded switching mechanism [Si09]. In order to balance countervailing processes, i.e., incremental and discontinuous innovation, [SS10] suggest three aspects: First, the system has to monitor its stabilization mechanisms. Second, potential failures have to be identified by opposing the developments in the systems environment as well as its operations. Lastly, they suggest to continuously check whether or not the organizational architecture still works sufficiently. Moreover, [SS10] highlight that the recognition of a problem does not

[3] We are well aware that [SS10] consider organizational ambidexterity and balancing countervailing processes alternative concepts. However, we argue that in the light of cyclical ambidexterity as suggested above, the commitment to a sequential character already addresses the problems of a "dual structure" as discussed by [SS10]. The thoughts of [EFB09] support our reasoning.

trigger actions automatically. The decision whether or not the organization needs to change, learn, and transform needs to be made explicitly as there also might be reasons to maintain discrepancies (e.g., for image reasons or in expectations of legislative changes).

The concept of balancing countervailing processes provides a good framework for realizing cyclical ambidexterity. However, it stays on the conceptual level and does not highlight explicit ways to realize processes to accomplish identified needs for discontinuous innovations. We follow the authors' suggestion and explore the workability and increase the practicality of the countervailing processes-concept [SS10] in a three-step process.

A first step to increase the workability of the concept is to identify processes and toolsets which represent relevant incremental innovation processes within SMEs. A promising set of processes and tools for monitoring the internal operations and external environment is provided by quality management approaches (e.g., ISO9000, TQM, EFQM). The International Organization for Standardization (ISO) has reported that in 2009 more than 1 Mio. organizations worldwide and more than 47,000 organizations in Germany hold ISO9001 certificates (www.iso.org). The increase of certified deployments of systems for constant improvement shows that a lot of companies constantly strengthen their capacity for incremental innovation and developments. However, it is important to note that the degree to which quality approaches are embedded into an organization differs strongly. For example, [WB97] and [Bi05] observe that especially SMEs often adopt a minimalist approach which only includes gaining the actual certificate. We argue that deploying and living processes, audits, etc. within established quality management frameworks are a valuable efforts to realize incremental innovation in SMEs.

In a second step, we need to identify 'cycling points' that allow firms to switch from a mode of incremental toward discontinuous innovation. We argue that the deployment of quality management systems also provides ideal decision points for triggering discontinuous innovation or explorative activities. Audits as well as external quality management prizes (e.g., Baldridge Prize or Ludwig-Erhard-Preis) create opportunities for "cycling". Cycling means in this context that the results of audits or prize competitions present a legitimate base to switch to discontinuous and explorative settings. An important issue is again that quality management does not degenerate to gaining a certificate and that audits do not only have the character of a conformation ceremony [Bi05]. So far, we only confirmed the importance of a well understood quality management system in SMEs to be a means of exploitative activities. The important aspect in terms of cyclical ambidexterity is added if the top management cannot only decide whether or not to learn or to trigger incremental changes [SS10] but also to switch towards an organizational mode of discontinuous innovation. This provides the third step and extents the concept of countervailing processes. According to [Si09] this mode includes resource allocation towards changes in "formal structure and routines, practices and procedures, styles and systems of reward and control" [SS10:882].

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Thus, the third step requires the identification of processes and toolsets relevant for discontinuous innovation within SMEs. We argue that one possible way to create discontinuous innovation routines are open innovation instruments [Ch03]. Due to the rise of the open innovation paradigm in recent years [CC06] [Vr09], a plethora of open innovation instruments exists. Many of these instruments seem to be suitable for supporting cyclical ambidexterity in SMEs. In order to classify these instruments, the distinction of internal and external approaches for ambidexterity [Ra09] could be conferred upon open innovation instruments.

External approaches are defined by [Ra09] as the externalization of a set of activities or the establishing of alliances (e.g., [Ho04], [LR06]). In the context of open innovation instruments, lead-user workshops, problem broadcasting, or idea contests could be classified as external. In extant literature, external open innovation instruments and innovators outside of the firm have received particular attention. Many scholars have argued that the integration of lead users [JL09], suppliers [LTY10], or universities [BSS09] is beneficial for innovative performance of companies. Contemporary, there is initial empirical evidence that external open innovation activities are beneficial for company performance. For example, [LTY10] examine the relationship between open innovation activities and product performance. They find that information sharing with suppliers and co-development with customers is beneficial. More generally, there is evidence that both breadth [LH10] and depth [LS06] of open innovation activities are beneficial for innovative performance, at least up to a certain threshold value. Nonetheless, we consider in accordance with [Si09] fully-fledged external approaches to be unlikely in smaller firms due to restrictions of size and available resources. Additionally, traditional hierarchical systems often struggle to fully adopt an open innovation philosophy as far as “open” refers to a hardly controllable crowd.

Internal open innovation instruments focus on including peripheral innovators in organizations which are traditionally not included in (discontinuous) innovation activities [NBM09]. However, these instruments received less attention in research and practice in recent years. Internal open innovation instruments need to be capable of ad-hoc problem solving and need to enable developments totally detached from current practices and routines [HB01]. [SS10] highlight that these features contribute the organizational flexibility. As flexibility-injecting structures in organizations [EFB09] list, e.g., temporary assignments [AGL99], prototyping [ET95], and redundant organizational units. For meeting these needs and for realizing discontinuous innovation internally, external open innovation instruments can be modified and applied internally (e.g., corporate idea competitions like the IBM Global Innovation Jam). Most external concepts, however, assume implicitly a big crowd/number of employees. Consequently, these concepts are only promising in bigger corporations. An instrument better suited for SMEs’ settings are internal, temporal communities for open innovation [ELK09]. We will turn towards this specific open innovation instrument in detail in the next section.

By identifying relevant processes and decision points, we detected activities for quality management and activities in the context of internal open innovation instruments as countervailing processes as well as audits/prizes as being ideal decision and switching points. In the following section we clarify the major issues occurring when internal

communities for open innovation are deployed in order to countervail quality management processes. Moreover, we will pinpoint the socio-technical issues of communities for open innovation in SMEs.

4 Embedding Communities for Open Innovation in Organizations

Research on communities for (open) innovation still remains relatively vague and addresses various aspects like social or knowledge management processes [FO02] [Be03]. Recently, some scholars have specifically discussed how companies rely on IT-support in order to integrate innovators outside the R&D department but inside the firm into open innovation processes [Hu11] [PW06]. As research implies that communities require social and technical aspects, we base our definition upon communities of practice [Be03] as well as upon virtual communities [Pr00]. On basis of [Pr00], we define communities for open innovation by four characteristics. In communities for open innovation (1) employees interact socially as they strive for fulfilling own needs as well as performing roles usually differing from their job descriptions (open community character). The (2) community is problem-centered, i.e., an organizational innovation problem provides a shared purpose and manifests the reason for the existence of the community (community for innovation character). Moreover, communities for innovation share some (3) guiding policies (e.g., tacit assumptions and rules). Due to their virtual and/or dispersed character, these communities need (4) technological support in order to trigger and facilitate social interaction.

The extended concept for balancing countervailing processes in chapter 3 demands for an integration of quality management processes and communities for open innovation. It is important to note that phases of incremental and discontinuous innovation will not be distributed evenly. The explorative, discontinuous innovation phase can be characterized rather as “burst” [GSS06], in other words a shorter period. In accordance with the wide-spread usage of quality management processes, we see these processes as the “default” setting for incremental innovation [BT03]. Due to intensive research on various aspects of quality management systems, we will focus in the following on the issues for integrating communities for open innovation as a countervailing process for discontinuous innovation. We address in the following four major integration issues (cf. [figure 1]): (1a) The definition of starting points, (1b) the creation of spill-over effects, (1c) creation of minimal invasive settings, and (1d) the design of points of re-integration.

[SS10] see the need for decision points for balancing activities and [Si09] demand the establishment of a switching mechanism. Both aspects demand (1a) the definition of starting points that trigger the installation of a community for open innovation as a means for discontinuous innovation. As addressed earlier, audits or results of prize competitions are valuable points in quality processes that could be appropriate starting points. In order to make them institutions that are capable of creating ambidexterity, these events need to receive high support, attention, and assigned strategic value from the management [Bi05]. Moreover, an institutionalized decision process needs to be in place that ensures that identified rooms for improvements can be deliberately not addressed, addressed by regular incremental change processes, or addressed by

communities for open innovation [SS10]. The last decision option should be used for settings in which discontinuous developments are expected or needed, e.g., problems that have developed due to the current culture or organizational behavior. To fulfill the countervailing characteristic, the decision to deploy communities for open innovation (the starting point) needs to activate a contrasting set of organizational routines and tools [Si09]. As communities for open innovation are separated, temporal, and virtual forms of organization, it is important to provide escorting activities that ensure that (1b) spill-over effects into the "default" processes are created and (1c) minimal invasive settings are ensured for all persons involved in the community. The first aspect can be ensured through a high communication activity/intensity by the community or responsible managers of intermediate results by means of both real (e.g., official meetings) as well as virtual (e.g., blogs) interaction channels. The latter aspect requires concise project management as well as supportive and time-saving collaboration tools. As the community constitutes around an innovation problem, solving the problem makes the community abundant. To ensure that discontinuous change really happens, the results of the community need to get to a (1d) point of re-integration. Consequently, the results of the work of the community have to be prepared in a way that can be transferred into regular quality management processes (e.g., included decision memo, suggested next steps and controlling variables). Similarly to the starting point, a decision point for re-integration has to be determined. Additionally, it is important to highlight that the voluntary character of communities [FMH08] can lead to the point that interested employees will continue working on open aspects although the organizational support for the community vanished. However, these persons are valuable change-agents and/or inner-organizational consultants for this topic. Thus, a platform for their further exchange should be provided (e.g., intranet platform).

As communities for open innovation integrate peripheral innovators of the firm (excluding R&D staff) [NBM09], the organization of this temporal and virtual group raises issues beyond the question of how such a community should be embedded. Hence, we address issues of the design of internal communities for open innovation in the following. In accordance with most authors in the context of communities for innovation, our definition included social (1-3) and technological (4) facets [WS00] [ELK09]. The problem-centered character already implies that communities for open innovation have a temporal nature and change or lose their organizational status as soon as an acceptable solution is found. Additionally, voluntary participation and efforts are implicit aspects as well because most members do not contribute to the communities due to their job descriptions [DBP04] [Fü06] [FMH08] [NBM09]. In a nutshell, communities for open innovation need to be considered as a particular socio-technological design. It is this tightly interwoven interplay of social and technological aspects which can "change the fabric of organizations" [Za07]. In order to successfully design internal communities for open innovation as a means for cyclical ambidexterity, at least three socio-technical issues need to be appropriately addressed [figure 1]: (2a) initiating activities, (2b) solution development activities, and (2c) coordination activities.

(2a) Initiating activities in the context of cyclical ambidexterity play a central role. [SS10] highlight that pursuing incremental and discontinuous innovation in the same unit might cause frictions on the cognitive level when individuals are asked to switch

modes. To reduce/break these frictions, initiating activities range from initiating (self-) selection procedures to introducing rituals that enable individuals to switch cognitive frames. (2b) Solution development activities support the actual problem solving process. It becomes a challenge to consider the diverse backgrounds of the individuals within the community on the one hand and also to use methods that allow to develop a common vocabulary and understanding at the same time [Be03] [Le08]. Due to the cyclical and dispersed nature of communities for open innovation such activities need to be enabled in online and offline formats. It is because of the same attributes that communities for creating discontinuous innovation need a different set of (2c) coordination activities. Most of these activities can be delivered best by technology mediated tools, for example, platforms with community functionalities [FMH08] [NBM09] or applications which allow for synchronous collaboration.

Although these issues are raised in the context of a certain discontinuous innovation problem, it is an organizational challenge to embed structures that allow for repeated usage of such a "flexibility-injecting structure" [EFB09:1266]. Thus, the social practices as well as the supportive technological infrastructure have to be constantly assessable and easy to activate in case a starting point for community for open innovation is set within the context of quality management process. Figure 1 provides an overview of the critical issues in the context of cyclical ambidexterity within SMEs.

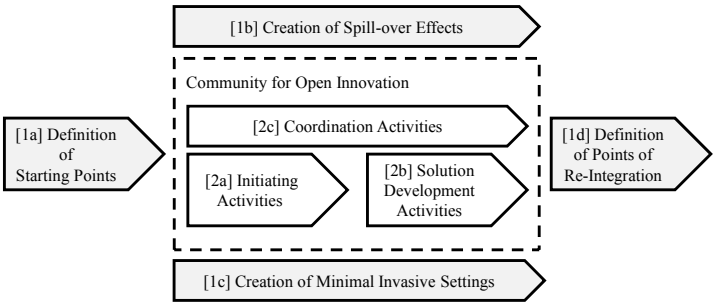

Figure 1: Issues of Communities for Open Innovation as a Means for Cyclical Ambidexterity

5 Creating Ambidexterity at Hofmann Personal – Deriving Socio-Technical Design Options for Internal Communities for Innovation

In order to validate our concept for cyclical ambidexterity in SMEs and in order to derive requirements for future socio-technological solutions for SMEs, we tested the framework at Hofmann Personal, a mid-sized German service company founded in 1985. Hofmann Personal provides staffing solutions and belongs to the ten biggest companies in the temporary employment industry in Germany with approximately 500 employees[4]. In order to constantly scrutinize and improve the organization of the firm,

[4] Note that companies in the temporal employment industry show very specific personnel structures. Hofmann Personal, for example, employs 500 internal employees, who are responsible for working processes within Hofmann as well as 20.000 external employees, who work for Hofmann's clients on a

the top management of the organization regularly draws on frameworks to assess the quality of the organization. Hofmann Personal is certified according to DIN EN ISO 9001 since 1997 and also holds a SCP certificate.

Our methodological approach followed the tradition of action research initially introduced by [Le47] as well as elements of the design science framework [He04]. We integrated interviews, group discussions and workshop transcripts into our analysis. Action research methodology allowed us both to compile ways to realize the identified potentials within the quality assessment as well as to examine the way how these potential solutions were developed [BR92]. In essence, we were able to "solve current practical problems while expanding scientific knowledge" [BM04]. According to [Bl55], action research is composed of two stages: the diagnostic stage and the therapeutic stage.

During the diagnostic stage, we interviewed 20 middle management and office assistants of Hofmann Personal in order to understand the socio-technological preconditions, causes of the underlying problems and potential improvements of the innovation and knowledge management. As a result, we identified big strength of the organization in exploitative and incremental activities. However, we also found a lack of explorative, discontinuous innovation activity – in terms of ambidexterity, we found an unbalanced situation. More specifically, as the company's processes and networks were designed to foster exploitation, we assessed that the firm was not able to solve an exploration problem within its current organization. As remedial action and countervailing process, a community for open innovation was implemented in order to develop the identified potentials.

During the therapeutic stage, we initiated the buildup of the internal, problem-centered community for open innovation within the company. To understand the socio-technological mechanisms at work, we conducted group discussions and observations of the project work in addition to the interviews mentioned above. We analyzed and coded Data with MAXQDA. In the following, we present our findings alongside the presented framework on the issues of communities for open innovation as a means for cyclical ambidexterity (cf. [figure 1]). We particularly highlight the social and the technological design elements as well as their interplay. The findings are grouped into issues for integrating communities for open innovation as a countervailing process for discontinuous innovation (cf. 5.1) and into issues of the design of communities for open innovation in SMEs (cf. 5.2).

5.1 Conditions and Design of Temporal Cycling at Hofmann Personal

The stimulus of the research project at Hofmann was an external quality-assessment (Ludwig-Erhard-Preis, EFQM), in the course of which the company identified several potentials for further improvements. While not all unrealized potentials required leaving Hofmann's traditionally exploitation oriented structures, external consultants as well as the top management of the company traced the most pressing matters to a lack of

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temporary basis. We refer to the number of internal employees when we consider whether Hofmann Personal meets the characteristics of a SME mentioned before.

exploration capabilities. The CEO of the company introduced the project to the workforce as follows:

"The Executive Committee decided to start the project in order to advance our competitive position as an innovative service company in the temporary employment industry. The initial stimuli for the project was an external EFQM assessment last year […]."

In particular, the quality assessment revealed that a focal weakness of the company concerns the synchronization of innovation and knowledge management processes. A first analysis showed that the organization lacked the social and technological preconditions for using and embedding open innovation instruments as countervailing processes. In order to establish an appropriate infrastructure, we followed the basic steps of the design science framework [He04]. Based on the framework presented above and additional information from the company, the socio-technological infrastructure was built with the intention of enabling ambidextrous activities.

Missing social and organizational components: Because of its complexity and its relevance to the whole workforce, the identified potentials could not be realized by the top management alone. Moreover, the characteristics of the task comprised elements of strategically select searching as well as reflecting and learning. [ELK09] argue that such tasks are especially suited to be solved by innovation communities. At the same time, optimization of innovation and knowledge management processes required insights in extant organizational structures and practices. Thus, the characteristics of the task to be solved called for an integration of an internal community composed of Hofmann employees. However, the methods for initiating and facilitating such a community needed to be established first.

Missing technological support: As Hofmann Personal did not have available the necessary technological open innovation instruments infrastructure, it was necessary to provide respective information technology in order to support and run the project successfully. To keep the necessary changes minimal-invasive, the project team decided to use different services that support specific needs and integrated them in or connected them to the general infrastructure of the firm.

5.2 Definition of Starting Points, Escorting Activities, and Definition of Points of Re-Integration

Before we initiated the project, it was necessary to (1a) define a starting point. At Hofmann Personal, the top management decided to start the process after participating at the Ludwig-Erhard-Preis competition. The decision was made upon the results and experiences of internal assessments, the experiences of the external assessments, the results of the jury, and recommendation of an external consultant for quality management issues. Due to their nature, the management decided to address the identified potentials not by existing processes and practices. Although the decision in favor of the establishment of an internal community for open innovation was made before, succeeding in the prize competition could create additional positive thrust for the

community. The following quote from a finance assistant shows the positive atmosphere due to the award but also a hierarchical and exploitation-oriented culture:

"Recently, Hofmann Personal has won an award for the excellent quality management in our organization. With respect to economic performance, we are doing very well at the moment. Our CEO regularly sets goals for the organization – and in most cases, we achieve these goals."

Besides the award-related positive effects, the high identification of the employees with the firm and its owner created a strong social cohesion in the whole company as well as in the initiated community for open innovation. Being a typical characteristic of SMEs, the strong cohesion facilitated knowledge exchange within the community but also supported escorting activities due to personal networks and word-of-mouth effects.

With respect to escorting activities, the (1b) creation of spill-over effects and the (1c) creation of minimal invasive settings were identified being the most important issues to support the community. First, it was valuable to inform all members of the organization about the aims and intermediate results of the project. In order to provide information to all employees, we relied on both social events (i.e., plenary assembly) as well as technical design elements (i.e., intranet, CEO blog). The reasons for creating spill-overs are manifold. On the one hand, information and signals of top management support provide creditability and appreciation for the community and, thus, prepared the organization for changes due to the community's results [AF05]. On the other hand, these activities seemed to connect the community members stronger to the project. Second, the virtual character led to the fact that the community members were not fully relieved from their actual duties. Thus, it was crucial to organize the project in a way that participants received their community contributions as a minimal invasive and highly efficient activity. The following quote from a branch manager in a group discussion demonstrates the stress field of ambidexterity in SMEs, but also highlights the importance of an efficient setting.

"We are all constantly subject to pressure as we need to handle the orders of a large amount of customers. At the moment, our company is not able to create enough freedom for activities like this project."

The creation of minimal-invasive settings also required and aligned a socio-technological approach, e.g., timely and brief information online (intranet project page) and 5-minute pitching format to inform the middle management.

We were not directly involved in the (1d) re-integration process of the project results at Hofmann Personal. However, all community results were designed, modularized planned to provide a decision memo in order to re-integrate the results. The major findings of the community were integrated by the researchers, approved by the community, and identified blank areas were covered in additional virtual sessions. It turned out that a responsible community facilitator is important in order to integrate and compile the results. Moreover, it is important that a facilitator has technical means (e.g., virtual sessions) to discuss open points with the community. By proxy of the whole community, the facilitators presented the results at a decision-making body of the firm.

5.3 Initiating Activities, Solution Development Activities, and Coordination Activities

In this section, we discuss the most important social and technological design elements within the community for open innovation. Most important activities to (2a) initiate the community were to create creditability as well as to identify suited participants for the community. First, we heavily relied on the support of the top management in order to create creditability [ELK09]. For example, the CEO of the company stressed the importance of the community at various meetings as well as on the intranet. Second, we relied on implicit (e.g., statement of concise solutions) and explicit (e.g., interest in participation) self-identifying processes by using an online-survey which allowed for identifying very active and promising community members. The survey was built seamlessly into the technical systems of the organization. Additionally, it was designed and promoted in accordance with the principle of minimal invasiveness (max. five minutes effort). The distribution curve of the influx of the online survey was in line with the data reported by [TMB09]. In total, this approach identified a core community of 16 employees which were personally invited for offline workshops by the CEO.

The actual (2b) solution development activity was pre-structured by a succession of offline workshops, online open calls, and virtual sessions. The offline workshops were held at the headquarter of Hofmann Personal. The virtual sessions were held on an online innovation platform which included functionalities such as a virtual whiteboard, chat rooms, and data management. Due to the highly geographical dispersed character of the company, the interplay of the social and technological design here was most obvious. When we asked participants in a group discussion to assess the virtual meetings, one external staff coordinator said:

"We are living in an age of information technology. We should do such things more often. Telephone or video conferences, meetings on virtual whiteboards – it is just not worth to drive 400 km by car if it is not necessary."

However, participants agreed that virtual work would not have been successful if they had not met each other before in the headquarter. As another external staff coordinator put it:

"Workshops in the headquarter are important to get to know each other. After that, you can work successfully in virtual meetings." and *"I am not sure whether the virtual meetings would have went so well if we had no clue about the other participants."*

Hence, the social design (workshops in the headquarter) was important to develop social relationships between participants and virtual design elements helped to meet the criterion of minimal invasiveness and created interactivity. In order to foster interactivity amongst the community within virtual collaboration sessions, only synchronous collaboration tools delivered acceptable results. In order to increase interactivity throughout the firm, an additional survey tool was deployed to broadcast specific questions in the course of the solution provision to all employees (open call format).

Within the community for open innovation at Hofmann Personal (2c) coordination activities needed to be organized. On the one hand, scheduling issues are of crucial importance in virtual communities. Here, we relied on traditional office solutions like official calendar functionalities but also on web-based community solutions like doodle. On the other hand, we needed to coordinate and facilitate the information exchange between the community members coming from different backgrounds. With respect to social design elements, we supported the development of a uniting language and artifacts. Important steps in this context were the branding of the project and the application of methods which supported individual members to create and modify common artifacts / boundary objects (e.g., lego serious play or a UML-adaption) [Be03].

5.4. Services Instead of Platforms

As discussed in the previous section, an appropriate IT infrastructure was crucial to embed and support an internal innovation community into the organization of Hofmann Personal. In line the design science framework, we want to highlight explicitly the learnings for the technological infrastructure in order propose and enter a next development cycle [He04].

In general, the typical SME-infrastructure situation at Hofmann Personal led us to the decision to use a set of services instead one single platform: To embed the project in the organization of Hofmann Personal, we relied upon the company's intranet as well as on the blog of the CEO. These channels allowed us to inform the whole workforce of Hofmann about the starting point and intermediate as well as final results of the project (embedding services). To support the work within the temporal open innovation community, we relied upon online surveys to identify suitable community members (identification service). Moreover, the internet-based open innovation platform was of central importance for the success of the project (collaboration service). The platform included several functionalities such as a virtual whiteboard with several working modes (e.g. brainstorming), personal profiles and relationships, chat rooms, data management or discussion forums. Finally, calendar functionalities as well as doodle polls supported the coordination activities during the work within the community (coordination services).

In the course of our action research project, we observed two main difficulties. First, the chosen infrastructure was not designed in a way that the project work could be easily integrated into the EFQM processes within Hofmann Personal. Thus, we propose that identified potentials (which mark the starting and end points) should be constantly accessible for the community members. This could be done by a service that integrates visualizations of quality management frameworks as well as realized potentials and developed solutions. Second, we observed difficulties in switching between offline and online working modes. We argue that an online platform that portrays the same graphical elements used in the offline workshops would have enabled an easier switching between online and offline phases of the project.

6 Discussion

In this research paper, we have investigated how internal communities for open innovation enable SMEs to countervail incremental and discontinuous innovation and, hence, to develop ambidextrous capabilities. The contribution of this study is threefold. First, we show how SMEs can make use of the concept of ambidexterity. Extant literature focuses on cases of large corporations while only few scholars have investigated the tensions of exploration and exploitation in smaller companies (e.g., [Lu06] [CD07]). As many of the ways to build ambidexterity are not feasible for SMEs [Si09], we propose that temporal communities for open innovation within the boundaries of organizations provide a fruitful avenue to balance incremental and discontinuous innovation. Second, we provide a more comprehensive picture of cyclical ambidexterity [Si09] by integrating the framework of countervailing processes [SS10] into extant ambidexterity theory. While other scholars remain vague concerning their arguments on the organization of cycling activities, we offer an approach that integrates existing processes (i.e., quality management activities [Bi05] [PB06]). Thus, our approach is closer linked to practical implementation. Finally, we identify crucial issues for implementing communities for open innovation, which are characterized by social design aspects, technological design aspects as well as their interplay [Za07].

Concerning theoretical implications, our study bares that research findings on ambidexterity in large corporations cannot be easily transferred to SMEs. Because of the specific characteristics of SMEs (e.g., resource bases or influence of the top management [Lu06]), we argue that scholars should not study antecedents and consequences of ambidexterity without taking company size into account. Furthermore, our study has implications for the theory on organizational innovation in general. While there are intense academic debates both on open innovation activities and ambidexterity, only a few scholars have combined those two streams of literature (an exception is [BS10]). We argue that an integrated view can enrich theory and workability of the concepts. Finally, our study highlights that theory on communities for open innovation needs an integrated perspective on social and technological aspects [Za07].

This paper also has important implications for managers of internal communities for open innovation as well as for strategists. These communities should be deployed to temporarily depart from paths of incremental innovation and to inject short bursts of discontinuous changes. There are various implications for the social system and organizational design. For example, managers need ensure to calibrate quality management activities (e.g., decision options in audits) and open innovation instruments (e.g., basic workshop design for communities). In addition, managers have to foster cultural change within the organization in order to raise the motivation for voluntary contributions to internal communities for innovation [Na02]. Other managerial implications relate to technical aspects. For engaging continuously into cycling activities between incremental and discontinuous innovation, companies need to develop an appropriate information technology (IT) infrastructure, especially for the shorter phase of discontinuous innovation. It is important that the infrastructure supporting communities for innovation can be activated and hibernated on demand and can be flexibly aligned to the innovation problem (e.g., by using a modular “app store” concept

with basic community functionalities). Furthermore, it should allow for information spill-overs between the community and other interested employees as well as transfer results easily into incremental innovation processes [NB09]. Moreover, support tools for internal communities need to substitute coordination mechanisms as typical hierarchical mechanisms do not work for communities [Na02].

This study is not without limitations. Some limitations provide avenues for future research. For example, the methodology of action research is appropriate to develop theoretical understanding [Br03] about cyclical ambidexterity by means of internal communities for open innovation. However, there is need for further empirical work that disentangles the causal motors in this context, both on a quantitative and on a qualitative basis. Furthermore, we investigated only one exploration cycle in our study. Future, longitudinal studies over several cycles promise, for example, deeper insights into organizational design aspects or will answer the question if continuous cycles trigger cultural change toward harmonic ambidexterity. We are convinced that the avenues discussed here provide interesting starting points for scientific work and hope that our study stimulates fruitful discussions among scholars on organizational innovation.

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