

An Ambidextrous Approach to Practice-Based Innovation for Social Product Development: Lessons From A Dutch Company

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Abstract—In the face of increasing competition, an organization’s capacity to acquire knowledge from the outside has become fundamental for new product development. Pertinent extant literature has stressed how an organization should practice social product development, allowing for the inclusion of all types of stakeholders in idea generation, selection, validation, and commercialization. This article investigates how organizations can acquire, maintain, and use different sources of knowledge via ambidextrous habits of exploitation and exploration to sustain social product development. A case study based on 27 semistructured interviews and field observations at a leading, large-size, Dutch food-service company has been carried out. The findings illustrate the organizational processes and mechanisms that the company has adopted to address and combine practice- and research-based knowledge, as well as the main barriers limiting the accumulation and usage of this knowledge inside organizational boundaries.

Index Terms—Customer relationship management, decision making, entrepreneurship, knowledge management, new product development (NPD), organizational aspects, research and development management.

I. INTRODUCTION

AN ORGANIZATION’S propensity to acquire and use different types of knowledge is a relevant factor in the face of increasing competition and rapid changes in customers’ needs and preferences [1]. An organization should be capable of simultaneously managing knowledge acquired through everyday work (practice-based) and knowledge that is kept up to date by advances in research (research-based) through interactions with relevant and external stakeholders and final users [2], [3]. Indeed, the simultaneous use of research-based and practice-based knowledge is crucial to a company’s adaptation to the market in an ambidextrous approach aimed at maintaining a continuous alignment with the market and users’ needs [4], [5].

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Social product development (SPD) recently has been receiving increasing attention from scholars and practitioners as a new and effective approach through which to develop new products by optimizing the acquisition of knowledge from final users [6]. SPD encompasses, in its broader framework, several socially based stages, such as crowdsourcing, mass collaboration, and crowdfunding [7]. Also, SPD does not develop social products, but rather develops products socially [8], [9].

However, despite the growing body of literature concerning alternative new product development (NPD) models, the importance of the synergy between the use of practice-based and research-based knowledge in developing new products and services socially remains a little-explored research area [2], [7]. In fact, previous studies (e.g., [2], [4]) have neglected to emphasize several social practices, striving instead to analyze dominant logics and action patterns.

Moving from these premises, Dougherty [3] remarks on the importance of integrating research-based and practice-based knowledge to enable an effective socially based NPD process. This approach allows for the delivery of innovative offerings to customers using knowledge gathered through interactions with final users at all stages of the NPD process [10]. Therefore, ambidextrous knowledge-management processes are, indeed, instrumental in identifying opportunities, exploiting them, and extracting the right insights from practice-based knowledge while integrating them with research-based knowledge [11]. Therefore, the SPD process, using both knowledge sources, has been adopted into the broader framework of the company’s ambidexterity [12].

Building on these assumptions, our study analyzes the interplay between practice-based and research-based dimensions of knowledge by investigating how the phenomenon occurs in social working practices by using ambidexterity as a guiding framework. Through our analysis, we traced the entire circle, from the capture of knowledge to its application, starting with the enactment of specific social work procedures [7] that, though limited by several emerging issues and problems, simultaneously lead to the development of new ways of understanding and ideas on how to handle the task or problem at hand [13], [14].

To analyze the mechanisms of integration between the two knowledge types in SPD, we conducted a qualitative study based on 27 interviews, field observations, and documental analysis. We discovered that the activities allowing for the collection and

application of practice-based knowledge often are connected strongly to the SPD process. In fact, the company examined in the present study combined practice-based knowledge with research-based knowledge to perform an effective SPD activity.

This article is structured as follows. In the next section, we present a literature review that highlights the connection between ambidexterity, knowledge, and SPD. Section III is devoted to the presentation of the case study and methods, while Sections IV and V focus on the emergent findings. Finally, Section VI concludes this article.

II. THEORETICAL BACKGROUND

A. Rise of SPD

Extant literature on innovation traditionally has focused its attention on “where” to search for new business opportunities and sources of knowledge, rather than on “how” to search for new opportunities, ideas, and knowledge [15]. In this vein, Appio *et al.* [15] showed that several acquisition mechanisms could be developed by companies, from ambidexterity to crowdsourcing and open innovation (OI), through a nonexclusive and mutually reinforcing approach.

Scholars have begun to stress the need to conceptualize properly innovative practices that organizations use to develop new products socially, namely SPD [6], [16]. Forbes and Schaefer [7] have observed that SPD is based on involvement by every socially engaged stakeholder in the ideation, development, testing/validation, and commercialization of new products. Thus, the SPD approach requires a total opening of the innovation stage to the masses and demands that organizations rely on so-called “mass collaboration,” which is a form of collective action used to harness and obtain ideas from many sources to find innovative solutions to complex problems [6]. The primary difference between OI and SPD is that the former requires that organizations share a specific problem with a structured network of stakeholders to gather possible solutions, while with the latter, unorganized stakeholders autonomously provide the organization with suggestions concerning both problems and solutions [10]. As SPD networks are unorganized, governance is shared between the organization seeking ideas and stakeholders autonomously deciding to participate [16]. Therefore, interactions in SPD networks are fluid and flexible, rather than systematic, structured, or hierarchical. The SPD approach differs from using only crowdsourcing platforms as well. In fact, stakeholders joining an SPD network are not hired to perform a specific task; they simply decide to provide suggestions to the organization on a personal basis [17]. SPD then could occur frequently, either on organization-owned platforms (i.e., organizations’ websites or social media pages) or during a physical encounter between the organization and its stakeholders (i.e., during the purchase of a product) [7]. As a result, the SPD practice can be viewed as an informal and unstructured approach in which all actors involved in the NPD network contribute to the product’s development, from ideation to commercialization, by producing a constant flow of knowledge converging from the outside to inside the organization [6], [16].

Martini *et al.* [1] suggest that organizations should develop adequate knowledge-integration mechanisms to combine and recombine different knowledge sources effectively. In this connection, internal and structured routines and procedures play a critical role in the effective integration of different knowledge flows. Also, Wu *et al.* [6] identified two common enablers of any successful SPD initiative: 1) the existence of touchpoints between the organization and stakeholders, and 2) the presence of proper knowledge-management processes within the organization. Therefore, the knowledge exchange between the actors involved in the SPD process is essential, together with a series of digital and physical points of contact (e.g., online communities, stores, points of sale) to gather intelligence from users about existing or possible new products [6].

Also, managing interplay within explicit and implicit/tacit knowledge flows is essential to SPD success [18]. Therefore, organizations wishing to capitalize on SPD opportunities should develop knowledge-management capabilities to support the simultaneous intertwining of explicit and implicit knowledge [18].

The interplay between implicit and tacit knowledge [19] allows the organization to create new knowledge, which can be externalized successively and combined, enabling the actors involved to collect and codify new knowledge [20]. This process is coherent with the scope of SPD, which is to make stakeholders express their ideas, self-validate them, and create new knowledge that is useful to the development of innovative products.

B. Ambidextrous Knowledge Management Perspective on SPD: The Importance of the Interplay Between Practice-Based and Research-Based Knowledge

To pursue innovation, organizations should be able to carry out knowledge exploration and exploitation simultaneously [21]. Exploration activities are fundamental in identifying the right pieces of knowledge, while exploitation activities are needed to capitalize on all valuable ideas and insights promptly. To leverage SPD’s innovation potential fully, knowledge-management processes should be characterized by both exploration and exploitation capabilities [21]. The exploration capabilities—which usually are based on discovery, improvisation, and experimentation—allow the organization to detect new opportunities and be ready to change established thought and action patterns by identifying and extracting relevant insights from this knowledge [22]. On the other hand, exploitation capabilities—such as knowledge refinement, alignment, control, standardization, and implementation capacities—are needed to establish efficient ways of acting across the organization [5], [12]. Employees in an organization characterized by diffused exploration capabilities generally can seize new opportunities promptly [23]. Even though these capabilities serve a different purpose, if they are developed and used in a complementary, balanced, and coordinated manner across the organization, the interplay between explicit and implicit knowledge may generate new knowledge that can be used for SPD. Indeed, the balance between knowledge exploration and exploitation activities within the organization serves to conciliate the paradox of flexibility and efficiency that is ingrained innately in continuous product-development

processes [5]. Such balance is referred to in existing literature as *ambidexterity*, and it represents an organization’s capacity to identify and exploit opportunities that originate across its boundaries to obtain a “best-fit” configuration that allows the organization to innovate and generate value continually [24].

However, scholars have paid only limited attention to the analysis of how tacit knowledge existing in stakeholder networks could become explicit and be turned into new products [3]. From this perspective, the nascent practice-based innovation theory could represent a valuable conceptual tool for unpacking the relationship between SPD, gathered knowledge, new knowledge-creation processes, and ambidextrous knowledge management.

Practice-based innovation allows organizations to benefit from the knowledge that employees gather during their interactions with stakeholders and during daily work practice [25]. Dougherty [3] observed that knowledge that an organization uses to develop new products exists in the daily operations, routines, and practices that employees perform daily. In fact, knowledge may be collected implicitly by everyone involved in an organization due to recurrent personal interactions, which usually are part of work-related routines and practices [14]. Within this perspective, three activities that facilitate collective capturing of tacit knowledge stemming from practice were identified: 1) *interweaving, designing, and using*; 2) *participation in action*; and 3) *reflection in action* [26]. The first refers to the ways in which a specific activity’s principles are interwoven into a particular setting, such as the environment in which the interaction between stakeholders and employees occurs. Employees cannot fully understand an activity or the way customers use a product merely by examining the technical principles behind them [27]. To enrich their knowledge, they should fully engage in the physical and social contexts in which the activity takes place or where customers use the product [28]. *Participation in action* allows employees to better gather and share knowledge [14], as well as better understand how activities are enacted [29]. *Participation in action* allows knowledge to be elevated from a tacit status to an explicit status through the socialization process [19]. Finally, *reflection in action* allows employees who share social networking activities with stakeholders to frame and refine knowledge according to the specific situations continuously. It stimulates continuous learning and improvement, making it possible to develop new insights, as well as articulate new explicit knowledge by combining old and new codified knowledge.

These three activities trigger knowledge conversion, as well as the exploitation and exploration processes that are necessary to support SPD [10]. A key element in this process is the fact that every individual involved in the practice of an activity, or involved in the context of a relationship, is stimulated to act purposefully and uncover new meanings that, after being tested and shared, can become collective meanings. Therefore, the circular process—including *interweaving, designing and using*; *participation in action*; and *reflection in action*—can be viewed as an ambidextrous knowledge-management process that extracts new practice-based knowledge and transforms it into usable knowledge [3], [14], thereby enabling SPD processes. The collection of knowledge that may derive from mass collaboration (which is tacit and stems from employees’ practices and their

relationship with stakeholders) should be embedded into an ambidextrous process through which an organization’s employees should be active participants. Active participation in practice could allow an employee to develop a deeper understanding of the decision processes that underlie an activity, as well as stakeholders’ suggestions and critical issues related to the use of a product. Considering that explicit knowledge only can generate new knowledge when intertwined with tacit knowledge [11], [22], this process also would allow organizations to better exploit the results of research-based knowledge obtained through traditional research activities.

Extant literature on SPD and related approaches is still in its infancy [6], [7], [10]. Scholars primarily have focused on its conceptualization aspects, enablers, and, marginally, on which kind of knowledge is necessary for its success. What is missing an investigation into how such knowledge-creation processes, based on practice-based innovation, are articulated and developed within an organization. It is also necessary to better investigate potential factors limiting SPD efficacy results and SPD best practices. How an organization can deploy different sources of knowledge, via ambidextrous habits and practice-based innovation to sustain SPD, is this study’s research question.

III. CASE BACKGROUND AND RESEARCH METHOD

We adopted the qualitative case study method [30], [31] to allow for a comprehensive analysis of the multiple ways through which practice-based knowledge is extracted from social practices and integrated with relevant research-based knowledge provided by organizational and nonorganizational actors involved in formal and informal company processes. A single case study methodology is especially suitable for analyzing microlevel processes. We were interested in the entire cycle of knowledge management, starting with the enactment of specific social work procedures and continuing with the observation of interruptions, emerging issues, and problems. The case methodology allowed us to examine phenomena unraveling over time [32]. Additionally, it creates conditions for a deep understanding of the contextual setting [30], which is essential, as the observed phenomenon is embedded strongly in its context.

A. Sample

The case study focuses on service innovation because unlike products, services are tangible, perishable, and require stronger customer interaction upon their delivery [3], [5]. Both due to the less-tangible character of a service offering and to the huge amount of interactions with customers, this context offers a larger intangible knowledge component that needs to be exploited when developing new services compared with new products [3], [14], [20]. This knowledge component considers customers’ use of the service and the firm’s production and delivery of the service.

The specific setting for this research¹ was a large Dutch food service company (referred to henceforth as “Alpha”) that

¹Please note that we have used fictional names to preserve the privacy of the company under analysis.

began operations 25 years ago and has since been dedicated to catering at educational institutions, as well as maintaining vending machines. A few years ago, Alpha acquired a small Dutch catering company (referred to henceforth as “Beta”) to strengthen its competitive position in seeking contracts for events, catering, and festivals across the Netherlands. Beta has been integrated into Alpha’s business, but it is considered a strategic business unit within Alpha. In early 2017, a large Italian catering company (henceforth “parent company,” or “PC”) that operates in many European countries decided to acquire Alpha in an effort to access the Dutch market and expand its business portfolio. PC started its operations in 1992 in the restaurant and food industries, offering its services to corporate businesses, educational institutions, hospitals, and healthcare centers. Alpha has approximately 160 selling points, an average turnover of €43 million per year, 700 employees in the Netherlands, and a leadership position in the Dutch market. In our analysis, we distinguish between Alpha and Beta because, although they are the same company, Beta is managed as an SBU, with its managers and employees working in a different sector (catering) with slightly different practices. Alpha was selected because it recently developed a new food-catering concept in the Dutch market, given the recent acquisition of Beta. The development of a new catering service showed a radical deviation from the usual approach to service innovation—one that traditionally is dominant in the industry—involving an extensive network of customers, suppliers, and intermediaries. The new managerial team favored and strongly supported the new catering concept and brand development.

This organization is strongly influenced by a blunt amount of knowledge exchange occurring through front-line employees dealing directly with customers. Therefore, it represents a suitable case for exploring how knowledge stemming from interactions with the masses leads to new products.

B. Data Collection and Analysis

We collected empirical material for this study between June and October 2018. To obtain multiple perspectives on the knowledge flows crossing the organization, we relied on field observations and 27 semistructured interviews with managers and employees across a diverse range of functional levels. Empirical data were gathered at regular time intervals over a six-month period. Alpha was conceived as a lead firm in the sector, with a centralized decision-making process relying on different managerial layers. Therefore, we focused particularly on understanding how managers, operating at the center of organizational networks, maintain and develop the idea of a new service system in the context of their networks. Together with senior directors at the lead company, the network of other managers who were relevant in influencing and participating in the service innovation process was determined, resulting in three different groups (senior managers, middle managers, and managers’ assistants/front-line employees). Senior directors indicated possible respondents in each business unit (operations, facility unit, formula unit, daily catering, service office), covering specific roles within NPD or innovation processes and

with different functions, such as general manager, director of operations, operational manager, sales director, cluster manager, location manager, formula manager, head of formula, head of facility, facility manager, and head of events and banqueting. Thus, we purposefully sampled 27 participants to cover all key transaction types and seniority levels. Specifically, senior directors gave us access to the identified respondents, helped us obtain clearance for fieldwork and audio recordings of interviews, and introduced us to possible respondents. Data were collected across the identified network and included individual interviews at various sites, organizational documentation, and website design. We also relied on observation. Through site visits and facilities tours, we were in a position to see employees at work and communicate with others within the identified networks. A field note was also developed. However, as our goal was to develop a detailed understanding of the interplay between practice-based and research-based knowledge, particular importance was placed on the individual semistructured interviews with key respondents. The sample we investigated comprised of 5 senior managers, 18 middle managers, and 4 managers’ assistants/front-line employees. Therefore, the total sample comprised of 27 interviews. For a detailed breakdown of the sample, please see Section 1 in the supplementary material.

The interview protocol was designed in line with those of similar studies [33], using the best practices for semistructured interviews [34]. The protocol comprised a series of open-ended questions about the company’s history, the challenges faced, and the strategies implemented (see Section 2 of the supplementary material). In conducting interviews with informants at various hierarchical levels, we obtained a variety of views and triangulated the empirical material. Throughout the interviews, informants were encouraged to discuss additional perceptions or company characteristics that might affect both exploration and exploitation tasks, knowledge acquisition, or knowledge management, or that might offer any other relevant remark for this study.

The interviews, lasted 60–90 min each, were tape-recorded and transcribed, and accumulated, for qualitative data analysis, a total of 2011 min (33.52 h) [34]. Additionally, during the on-site visits, observations and insights were recorded and used to complement the transcribed interviews to obtain a more thorough understanding of the emerging findings [31]. Once the transcribed versions of the interviews were ready, the individual analysis was carried out with the assistance of MAXQDA 2018 software. Data were analyzed by adopting iterative grounded theory coding processes and examining the literature and data to develop grounded categories [35]. We began by analyzing publicly available material (e.g., company website, newspapers, and articles in the business press) related to the company. Simultaneously, we scanned existing academic literature to identify a relevant theoretical framework that could guide our study and represent effective investigative support [30]. We began by carefully rebuilding the order of actions and interactions carried out by the organizational and nonorganizational actors in the network and associated each with incremental innovation development. The relevance of actions and interactions was established by evaluating the ways in which they impacted the final

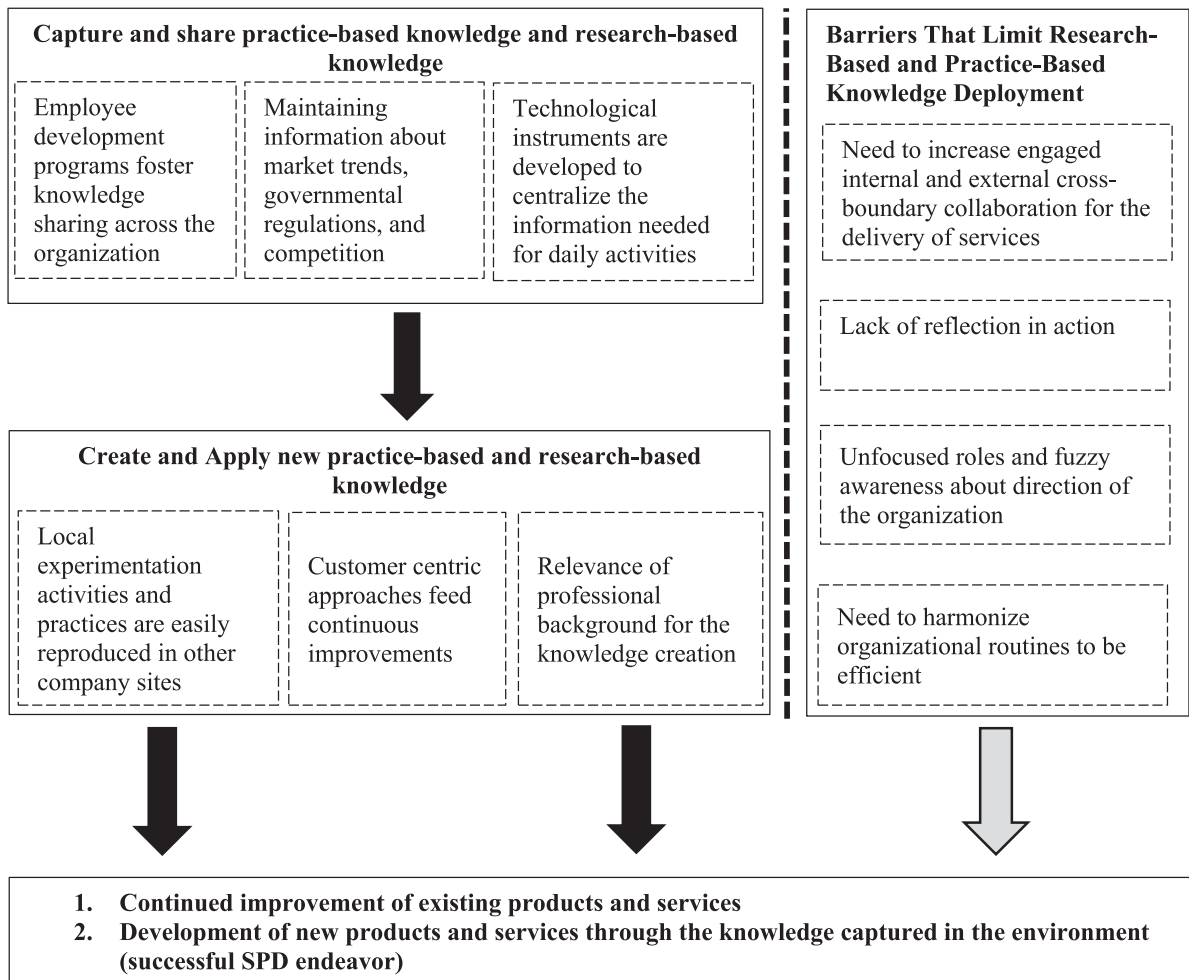


Fig. 1. Outcome of the data.

incremental service development results that we had monitored. Two researchers executed and cross-checked the interpretation. In line with Gioia *et al.* [36], Table I describes the data structure derived from a three-stage coding process conducted by the first and second authors. We began first by producing open coding, a descriptive process that adopts *in vivo* codes emerging from interviewees' terminology. By clustering convergent categories at a higher level of abstraction, we determined theoretical categories or second-order themes. Our last step was to build a ground model by analyzing relationships between second-order themes and aggregate analytical dimensions (i.e., capturing and sharing research-based knowledge and its connections to practice-based knowledge), as well as a more abstract general model. Patterns were identified, and the first-order indicators were developed [31], [34], as shown in the following table (see Table I). For additional details, please see Section 3 in the supplementary material.

As some of the evidence was unexpected and interesting, further reiteration between these findings and a new literature review allowed for the development of the second-order concept, which was later classified in overarching dimensions. Afterward, a model was developed to demonstrate the dynamics of the

first-order indicators, second-order concepts, and theoretical themes.

IV. FINDINGS

The emergent findings have been summarized in Fig. 1. They describe the emerging micromechanisms and processes connected to Heisig's [37] life cycle stages, including "create, store, share, and apply" knowledge-management activities, both for practice-based and research-based knowledge and the perceived barriers that limit acquisition and usage of practice-based and research-based knowledge. Each secondary order concept also has been described in detail with supporting quotes.

In the following paragraphs, we analyze how the company captured and applied the knowledge produced and the barriers encountered during the process.

A. Capture and Share Practice-Based and Research-Based Knowledge

Numerous patterns have been identified concerning the company's efforts to capture knowledge. In doing so, the company

TABLE I
INDICATORS, CONCEPTS, AND THEORETICAL THEMES

First-Order Indicators	Second-Order Concepts	Theoretical Themes
Software helps to organize, store, and accumulate internal knowledge.	<i>Technological instruments are developed to centralize the information needed for daily activities.</i>	Store and share practice-based knowledge and research-based knowledge.
Brand-book is developed to standardize and organize products across locations.		
Ticket system enhances standardized way to deal with and fix emergent problems from the locations.		
Keeping track of market trends, governmental regulations, and competition.	<i>Maintaining information about market trends, governmental regulations, and competition.</i>	
Training in the form of workshops allows for collective reflection on the goals and direction of each department.	<i>Employee development programs foster knowledge sharing across the organization</i>	
Continuous employees' development via HORECA courses.		
Informal coaching that surfaces embedded knowledge within locations.		
Informal coaching that surfaces embedded knowledge within locations.		
Organizations aiming to base the selection of employees for a specific role according to skills		
Experiments in one location have the potential to be extrapolated to other locations.	<i>Local Experimentation activities and practices are easily reproduced in other company sites</i>	
Existing freedom of entrepreneurship to act logically and dare to be creative.		
Professional background of employees is determinant to connect experience with outside knowledge sources and purposefully create.	<i>Relevance of professional background for the knowledge creation</i>	
Initiatives to improve the products offered to the customers.	<i>Customer centric approaches feed continuous improvements</i>	
Being receptive to both consumer's feedback and input enhances continuous improvement.		
Departments are being built to have a more structured delegation of tasks.	<i>Need to increase engaged internal and external cross-boundary collaboration for the delivery of services.</i>	Barriers that limit Research-Based and Practice-Based Knowledge Deployment
Formula department demands internal engagement to surface and organize practice-based knowledge.		
Alignment in between operations and sales departments is needed.		
Flexibility is required from employees to support and fill in other different positions.		
Little connection with Beta, limited just to cover certain events from Alpha.		
Externally teaming up with external parties allows for extension of the service portfolio to some extent.		
Improvisation and compliance with daily delivery of services.	<i>Lack of reflection in action.</i>	
Events are more prone to be monitored than the catering within the locations (before, during, and after).		
Need to share and promote successful stories from different locations and seek implementation.		
Employees are uncertain about the mission of the organization.	<i>Unfocused roles and fuzzy awareness about direction of the organization.</i>	
Managers share their expectations and promote learning by doing.		
No routines in bottom hierarchical levels, there is more clarity in top hierarchical levels.		
Each department has their own goals and low alignment with others.	<i>Need to harmonize organizational routines in order to be efficient.</i>	
Meetings where decisions are barely consensual.		
Too broad a scope of services that derives in chaos and sometimes low quality.		

built a common knowledge base whose purpose was to accumulate all practice-based and research-based knowledge that had been embedded across the organization until then.

1) *Technological Instruments are Developed to Centralize the Information Needed for Daily Activities:* One thing that the company did was implement the software “Easy disc,” which contains detailed information about the costs, processes, prices, allergen lists, and further details on the products available at the locations. This new software helped proliferate the practice-based knowledge necessary to produce and reproduce services in a standardized way across all locations. The development of the “Easy disc” software was in the hands of one employee, who ensured that all the knowledge on formula management, finance, and quality assurance was made available.

In addition to the “Easy disc” software, the Formula Department focused on developing a complementary capturing tool named “Brand Book”:

[...] With Brand-Book, we can change and update the corporate assortment four times a year and three times a year for education. – Formula Department Head

The Brand-book contained the specifications concerning the most ideal way to present and manage the location, how long it should take to produce something, how many items should be sold to comply with the overall budget, and how to manage the time necessary to comply with the organization’s sustainability values. The company also developed a ticket system to report, track, solve, and provide feedback on all the problems and issues emerging within each location, along with an ERP system called “CASA” to track the selling point of Alpha.

2) *Maintaining Information About Market Trends, Governmental Regulations, and Competition:* We found that many different organizational actors were focused strongly on the collection of external knowledge. The acquisition of relevant knowledge was facilitated by the existence of established organizational practices able to address customer and market issues when they emerged. A location manager told us:

Due to recurrent meetings with our customers, we get the signal about if they like the coffee. If they don’t like it, we have to plan an improvement plan because I am not happy when my customers are not happy.

We discovered the existence of proper routines to address customer feedback and consequently activated the necessary improvements. For example, local manager 1 described the process for addressing customer complaints about the taste of the coffee as follows:

We had to find out first if the machines were working properly and if everything was calibrated and working in the right way, so then I asked again if they still didn’t like the coffee, and the customers were still not satisfied, so then I had to make the questionnaires to see what was going on and check the preferences. So, that is the phase we are (in) now and now [...] I shared this with the supplier and checked which coffee bean is appropriate for this machine, then they will give me some ideas, and that is the next phase. [...].

Besides the reactive and preventive actions toward customer feedback, many of our informants described how they explored

global and local markets to gather intelligence, even from external sources. For example, a cluster manager described his own initiative to explore the local market directly as follows:

I like going to Amsterdam or to Rotterdam, or to several other places...other stores and check what (is) there that is new. New stores, new things in the shops, I go there and take a look, and if it’s possible to bring it to our stores, I do it. There is no one who tells me to do this. This quote highlights the lack of structure for exploring market trends and the strong individual motivation to understand and detect market signals.

Within the formula unit, the relevance of using trends to inform about assortment was clear as well:

In the formula team, we need to give advice about the assortment; we have to know about the trends, we have to give advice about the presentation [...]. – Formula Manager

Senior managers similarly reported that some employees had the opportunity to attend different events, most of which are within the realm of hotels, restaurants, and catering (HORECA).

3) *Employee Development Fosters Learning Across the Organization:* PC also was taking action to provide specific training to employees. One coach recently was hired to provide training sessions and workshops to build a collective reflection on the organization’s goals and direction. Each employee participating in these workshops could offer insights and feedback received from customers, debate them, and reach a consensus concerning how to use emerging consumer needs to develop better products. Furthermore, through the workshops, the sales director could train employees with the required skills on how to better interpret the preferences and insights coming from new or existing customers:

You guys are part of the formula team, and this is the best part of the job – What is our responsibility? What do we have to do? We have to give advice about the assortment. We have to know about the trends. We have to give advice about the presentation. –Sales Director

As the sales director explained to us, these workshops represented a simple instrument through which the company could elicit more focus from the staff within various locations and departments. Furthermore, according to what we collected from the formula manager, the best way to enhance relevant flows of knowledge creation and diffusion was to start sharing and teaching employees how to approach customers and consider the knowledge collected from them as vital for the company.

B. Create and Apply New Practice-Based and Research-Based Knowledge

The interviews also revealed that certain activities induce the exploration and exploitation of different knowledge sources, resulting in an application of the knowledge captured during the previous stage.

1) *Local Experimentation Activities and Practices are Easily Reproduced in Other Company Sites:* The organization incentivized experimentation with customers, which belonged to exploration activities, allowing for the development of new products. In the recent past, through these activities, the company

created new and sustainable soups and recyclable coffee cups. These previous instances had proved to local management that such experiments, which later became real products, would not have been achieved if the organization did not have the freedom to experiment and try different options. In addition, managers had the feeling that their employees' skills/abilities/expertise were aligned to customers' needs and helped facilitate these developments and implementations:

I show to my collaborators the ways to perform, but with the freedom to act because if I tell them exactly how I want things, I risk limiting their creative ability. I want young people in my team because they now have the connection with the market. – Sales Director

Managers were quite convinced that continuous experimentation and knowledge acquisition, both from the market and from customers, were effective in developing products and services.

2) *Customer-Centric Approaches Feed Continuous Improvements*: Satisfying customers' desires was the company's top priority. Customer requests could range from very high-end dishes to simple french fries. Despite variances in customers' requests, employees were asked to rely on their experience concerning logistics, together with their abilities to improvise and use the resources available to satisfy customers' needs:

It can happen by us that a client calls about 12:00, says that he has five guests and asks us to do something, and that is no problem at all, then we go shopping if necessary, and we make it happen. – Operational Manager, SDCO

With the reorganization prompted by the takeover of PC, more attention and awareness were placed on customers' needs:

There are customers who come inside the restaurant and say, "We want to eat something fatty; go away with your healthy stuff!" – and we have it. [...]. We have recently updated our (offerings) following the requests received by customers in our selling points. – Location Manager 1

The increased attention placed on customers' needs led to investing more effort in having products and offerings continuously renewed:

Because of the meetings with customers every three or four weeks, I got the sign that people didn't like the coffee. I had to make the questionnaires to see what was going on and check the preferences. I shared the results with the supplier and checked which coffee bean was appropriate for the machine. We also have a tasting session where I suggest only two beans...one week for one bean and another week for the other bean. Then we checked which one they like the most following the feedback. – Location Manager 1

Furthermore, additional effort was made to acquire more research-based knowledge by acting on social interactions. The company's existing-research-based knowledge constantly increased due to the interactive and peculiar environment of each individual location favoring the collection of new practice-based knowledge from customers and work practices. Therefore, exploration of different options became smoother, as the organization relied on day-to-day activities to make internal and external practice-based knowledge complement research-based knowledge. The knowledge produced through feedback by customers was used continuously to enhance the offer.

3) *Relevance of Professional Background for Knowledge Creation*: Employees with more seniority and a solid professional background seemed better at relying on their abilities/skills to become creative. For them, the process of exploration of an alternative also occurred in the absence of managerial direction and organizational standards:

[...] When I am on holidays, I am always looking in markets and restaurants, for the local things, for example. [...] I was in Malaysia, and it is so inspiring what you can find there in the food markets, so I tried to bring things here – for example, the chai latte, which was my idea to have because the girls especially like to have something sweet, with milk and with few spices, and it was a big success. – Location Manager 1

As aforementioned, employees conducted the exploration of knowledge informally just to keep their knowledge fresh and connected to what was happening in the outside world. Through individuals' spontaneous efforts, valuable and interesting knowledge sources could become available to be exploited through the prospect of new improvements to the organization's current offerings.

C. Barriers Limiting Research-Based and Practice-Based Knowledge Deployment

While the company showed a good capacity to acquire and use available knowledge, several issues emerged and acted as barriers to limit knowledge acquisition and usage. In the following subsections, we present our four second-order constructs.

1) *Need to Increase Engaged Internal and External Cross-Boundary Collaboration for the Delivery of New Products*: Several issues, such as sickness and overcrowded locations, often created conditions for the employees to be flexible and ready to cover different roles to comply with emergencies within the daily delivery of services. Even though this represented a very supportive environment, with a reduced level of pressure on a single employee, it prevented individuals from having enough time to think about how to improve and reflect on the event happening:

At most companies, you have three people to cover activities, but here, [...] during these periods, we do not have the time to perform the usual reflection and development activities. – Operational Manager Beta

To cope with the risk of having a reduced level of new ideas and improvements due to emerging issues, PC intended to create a more intense collaboration between Alpha and Beta to employ better use of their internal resources. In addition, some additional collaboration activities with external parties were attempted. They foresaw other parties' involvement in the ideation of new products, with cocreation events that also were supposed to secure easier access to external knowledge for the involved employees:

I do some development in Leeuwarden, together with a school, and we developed our own pesto, the recycling of plastic when we make our own packaging, our labels. That is the future of our company. – Head of Formula

In this environment, Alpha organized meetings with a school to become more aware of current trends and students' needs.

As stated by the Head of the Formula, the organization's future depended not only on engaged collaboration within departments, but also on cocreation activities established with external parties (such as innovation centers, suppliers, and schools).

2) *Lack of Reflection in Action*: As described in the theoretical framework, reflection in action takes place when articulated knowledge is combined with old and new insights, which are derived in continuous learning and improvement [2], [3]. However, the employees were used to prioritize the delivery of daily activities. Due to a lack of time, reflection in action often did not take place properly, creating a barrier to knowledge acquisition and usage.

In this connection, Alpha's operations director tried to develop a template to be filled by each cluster manager to gather some evidence on the amount of time employees devoted to collective internal reflection and about how each department and location positioned itself in relation to the customers they served, the operations they conducted, etc.:

I introduced a format that has a couple of things that I can measure. The format includes: How is the trust with the clients? Is it a good relationship or bad relationship? What is the position of purchase? [...] This is also something my department shortly measures, but I know that my department is unique because other departments are not in this same line. – Director of Operations

Through this information, practice-based information could be collected, and differences could be observed among locations and departments. This also comprised a good basis for managers to intervene to standardize the procedures and steps to follow.

3) *Unfocused Roles and Fuzzy Awareness About the Organization's Direction*: We collected pieces of evidence about the third category of barriers limiting the acquisition and usage of knowledge: lack of clarity about the strategic goals that the organization had to pursue and its impact on employees' conduct and performance. During the transition phase, before the procedures and processes operating across the locations surfaced and elicited analysis on possible improvements and standardization, employees with a solid professional background who have been in the company longer had to rely on their skills to explore various options during their everyday tasks:

We have in Hengelo an espresso bar, and it was making 200 euros a day, and now it's making 800 euros a day. And I achieved that with a good styling of the location and also helping people to believe in themselves [...]. – Cluster Manager 2

Without a solid information foundation and background, the cluster manager had to observe and act by himself through the learning-by-doing approach. In similar cases, employees with a trustworthy professional background had to count on their abilities/skills to find solutions to problems, regardless of any lack of direction. Thus, the accumulation of their practice-based knowledge could help employees make more informed action selections. However, while the organization gives employees the freedom to act, they found it difficult to connect their efforts with the broad company strategy as stated below:

Every day is different, and there are a lot of small things that I don't know what I must do. The director of operations doesn't tell me which direction to follow, (so) it's difficult to focus my effort in a clear direction. – Cluster Manager 2

Thus, while the inclusion of skillful employees could help deal more effectively with the challenges that arise from the nonroutine nature of daily delivery of services, having more structured, routine activities at top hierarchical levels (e.g., visiting locations, monitoring the agenda and action points coming from the meetings, and dealing with strategic decisions to comply with the overall budget) was expected to benefit the organization.

4) *Need to Harmonize Organizational Routines to be Efficient*: Several employees have remarked on the inefficiencies generated from the development processes conducted by PC. For example, the Formula Department's goal is to carry out research and development activities, but this goal has yet to be connected to activities in the rest of the departments and other locations:

As cluster managers, we try to pick up trends; we try to implement different things. It is a bit of a thing that several departments need to be involved to make the new products. – Cluster Manager 1

To align the departments, communication through various channels is needed. It is necessary to communicate and align not only the goals to be achieved but also the decisions made in the daily delivery of services. As several employees have mentioned, whenever a cross-boundary interaction like this takes place, embedded practice-based and research-based knowledge can surface, allowing for a debate to reach a consensus. This kind of approach sometimes proves to be useful, but other times, it proves to be inefficient due to ineffective organizational structures and decision-making processes:

When I make a wrong decision, I am always very clear that we have to stop because I didn't have a good overview of things or enough information. So, I bring people together and then I let them talk about it [...]. – Director of Operations

These situations make a significant impact on how both practice-based and research-based knowledge can surface and be shared and discussed within the organization.

V. DISCUSSION

We analyzed the case of an organization that uses both practice-based and research-based knowledge to support SPD [3], [7], [9]. Data show that several patterns wherein specific actions and routines are adopted to foster the social development of new products and the continuous improvement of existing products in an ambidextrous approach [10]. However, while several actions foster knowledge acquisition and usage, several other issues limit them, as shown in Fig. 1. Following the framework proposed by Heisig [37], it has emerged that technological instruments allow for the capture and sharing of practice-based knowledge from work practice and customers, thereby enabling the organization to transform knowledge in a reusable fashion [10]. This allows the organization to keep research-based knowledge updated continuously, thanks to insights derived from practice-based knowledge. Such a phenomenon emerges from organizational exploration activities that aim to identify new opportunities, which then may be exploited appropriately [3], [14]. Therefore, success is intertwined deeply with the

organization's capacity to create new knowledge through the transformation of tacit knowledge into explicit knowledge, as stressed by Nonaka and Takeuchi [19]. Practice-based innovation approaches that incorporate ambidextrous elements allow for interplay between practice-based knowledge (which often is tacit) and research-based, explicit knowledge to create new knowledge to be exploited in the development of new products in collaboration with customers, as required for a fruitful SPD [7], [10]. Therefore, the authors developed the following proposition:

P1: Social product development processes are intertwined deeply with practice-based innovation activities aimed at capturing knowledge from external sources.

In Section IV, we highlighted several activities emerging from PC that were viewed as having more structured action patterns. Before PC, employees were accustomed to having much flexibility to cover different positions whenever necessary and improvise accordingly to ensure the delivery of daily services. On one hand, such flexibility enhances an exploratory mindset that can involve different practices and enrich practice-based knowledge [5]. Therefore, the authors presented the following proposition:

P2: Knowledge from practice-based innovation activities, combined with research-based explicit knowledge, stimulates the emergence of new valuable knowledge.

However, the short-term focus in delivering daily services results in scarce resources, favoring exploitative efficiency, but limiting explorative activities. In this sense, the company's activities are focused more on the short-term exploitative side, rather than the explorative side, as limited time and resources are invested. Thus, the authors developed the following proposition:

P3: Companies' abilities to reduce barriers that hamper exploration, exploitation, and knowledge flow influence SPD strategies' success.

Also, PC aims to narrow the extent of flexibility, striving for more efficiency in ensuring that departments have their own allocated tasks and teams, and giving each employee respective job descriptions. It is through collective reflections and action activities, such as workshops, that employees can share and transfer produced knowledge, which is a crucial activity for an ambidextrous organization [12].

As Dougherty [3] mentions, being engaged and collectively participating in the organization's activities help employees act purposefully and learn in conventional ways. Along these lines, collaborating and being engaged on a cross-boundary level through workshops, or even between departments (as is happening between sales and operations), enhance alignment and foster informal learning. Thus, the knowledge that has been embedded within the organization can be identified, codified, applied [37], and consequently reflected upon by employees. Therefore, the authors propose:

P4: The new knowledge stemming from the interplay between practice-based and research-based activities allows the company to implement successful SPD strategies.

Fig. 2 summarizes the process of integrating both sources of knowledge to reach an effective SPD outcome.

The company took into account all activities identified in extant SPD literature [10]. Alpha employees were encouraged to collect insights and ideas from customers during their front-end daily activities to produce knowledge devoted to the development of new products and services that will be offered at selling locations. Furthermore, a continuous effort was made to validate and ideate new products and services offered both by front-end employees and managers, who encouraged final users to provide feedback on new ideas for products [10]. These actions were made possible through the cultivation of an environment that fosters the interweaving of activities and continuous implementation of new products. Therefore, Alpha's interactions with final customers give it the potential to acquire and apply knowledge to develop its products and services portfolio.

The company's effective acquisition of knowledge has been made possible using several instruments that allow for the capture of research-based (e.g., focus groups with customers) and practice-based knowledge [6]. To collect, organize, and store knowledge for future retrieval, both research-based and practice-based knowledge may be captured through tools developed internally, such as electronic knowledge repositories and document-management systems. As described in the findings, several attempts to integrate both research-based and practice-based knowledge have produced positive outcomes.

Regarding internal organizational autonomy, employees with broad knowledge, either from their professional backgrounds or their expertise within the organization, have proved to be able to seek both purposeful and useful alternatives that have the potential to be implemented through a strong attitude toward reflection in action [26]. Being more prepared to face SPD challenges, these employees have some responsibility to spread their accumulated knowledge via diverse communication channels (meetings, gatherings, workshops, etc.) to knowledge seekers within the organization [29]. In doing this, the accumulated practice-based knowledge, in combination with research-based knowledge "that is kept updated," can be both further increased and developed.

On the other hand, training and informal coaching are crucial in aligning newcomers, as well as less-experienced employees, with the rest of the organization. As part of the training, certain employees could take extra courses to develop the skills needed to use both sources of knowledge effectively. In this way, a purposeful selection of employees is crucial to the organization's efficacy in increasing the number of skilled staff to pursue a sustained balance between creativity (exploration) and cohesiveness (exploitation) [12].

Overall, the structural changes that PC currently is working on are aimed toward improved capturing, diffusion, use, and creation of new knowledge (channeled toward the improvement of services). Along these lines, the focus relies most on the bricolage of material, mental, and social resources that already are intertwined in work processes. It then is possible to assert that organizations that want to exploit SPD's potential benefits should focus first on practice-based innovation, particularly on improving ambidextrous habits within the organization [12]. Managers also need to focus on developing integrated routines

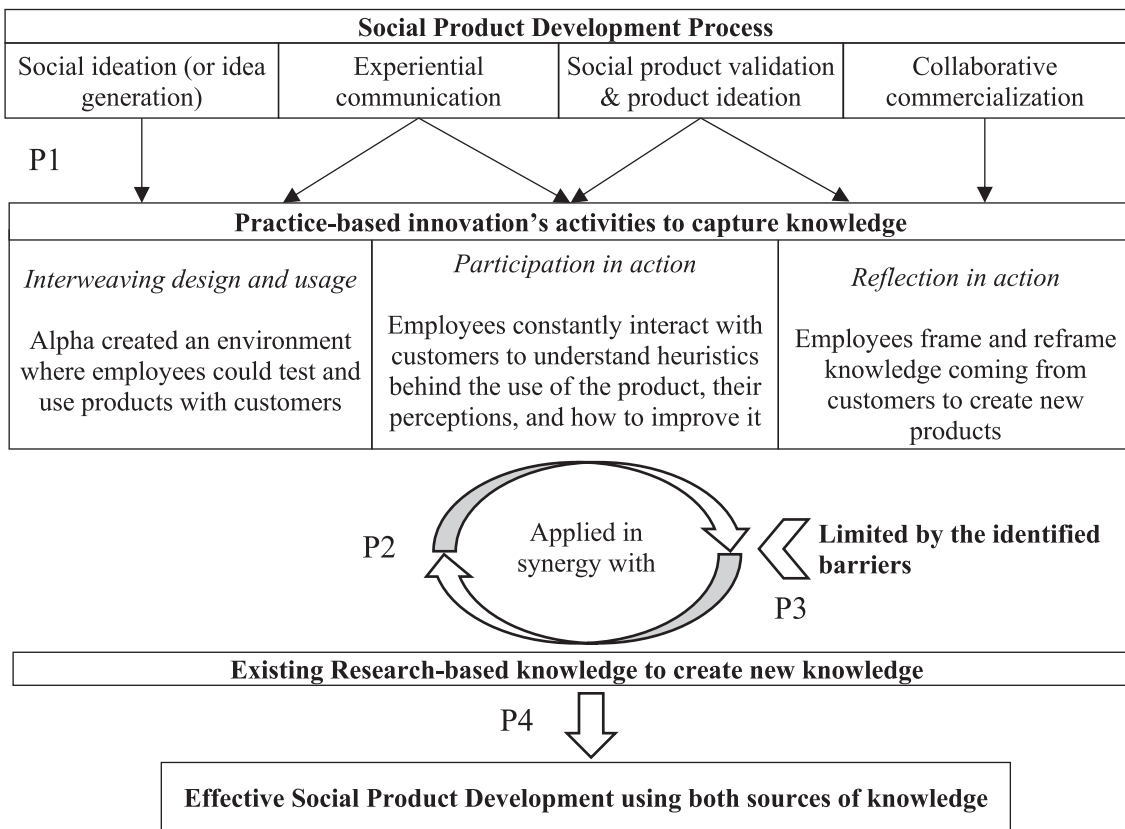


Fig. 2. Interpretative framework.

to increase knowledge collection, integration, and sharing [7]. Such routines should be supported by activities that aim to make the organization's employees more engaging when establishing relationships with customers. Finally, exercises to increase employees' reflection on their actions should be implemented [3], [14].

This article contributes to nascent SPD literature in several ways [7], [10], [13]. First, we observed how SPD could be supported by ambidextrous practices embedded within practice-based innovation literature. Second, we provided suggestions on how to implement SPD by following best practices. Third, we shed light on the barriers that may prevent SPD success.

VI. CONCLUSION

This article aimed to explore the synergy between practice-based and research-based knowledge. The active use of practice-based knowledge permitted the company object of our study to develop products together with customers, resulting in effective SPD activity.

However, practice-based theory and social-product development theories need a complete and holistic framework to elaborate not only on internal resources but also on how these resources enable collective exploration and exploitation habits to take place by deploying various knowledge sources.

While this article tried to explore thoroughly the organizational routines behind the effective flow of knowledge across

the organization using a single case study, different approaches to SPD are possible in different contexts. Therefore, this study's main limitations were linked to its potentially limited generalizability to different sectors and business contexts.

Further research could be done to understand more deeply the specific practices and activities that enhance and foster knowledge deployment for practice-based innovation and SPD. Different contexts also should be analyzed to understand different approaches to SPD. Finally, a need exists to expand understanding of the knowledge creation and acquisition mechanisms behind the SPD approach by applying already-available theories [1], [15] that propose holistic frameworks for SPD process knowledge management.

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