

Mixing Methods in Innovation Research: Studying the Process-Culture-Link in Innovation Management

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Abstract: Two trends in innovation management have influenced the basic idea of this paper. The first trend shows increased attempts by managers to utilize linear innovation processes derived from literature and from practice. The second trend is an increasing acceptance of the dynamics created in an "innovation culture," as being one of the key drivers of innovation. Both approaches partially contrast each other. Researching the literature in more detail, we found that studies explaining the link between innovation culture and innovation project management are rare. Indeed there is a study by Shona BROWN and Kathleen EISENHARDT (1995) which gives an excellent overview of innovation management research, but again the issue of "culture" was lacking. This missing link between innovation process design and innovation culture at the firm-level provides the theoretical framework of this paper. Behind the scenes of innovation management studies, we realized a methodological gap existed between the research of innovation cultures and their impact upon an organization's innovation processes. Thus, we applied a methodological mix of problem-centered interviews, structural analyses, and context analyses to study the phenomenon. We conducted an interview-based single case study in a Swiss telecommunications company. From these methodologies we created a themed landscape comprising relational topics of the innovation dynamics within an innovation project in the company (one year duration) and briefly described each topic. The main finding in our study is the dynamic role-model that innovation managers in large service firms have to apply to succeed in their innovation management work. Thus, our methodological mix proved to be helpful, although some weaknesses remain to be solved in the future.

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1. Introduction

Two trends in innovation management influenced the basic idea of this paper. First, the increasing attempts by managers to design linear innovation management processes that can be derived from literature and practice. Second, the increasing acceptance of the dynamics of the innovation culture, as key drivers of innovation influenced this paper. Both approaches partially contrast each other. In the following section, these two trends are presented. [1]

The first approach supposes that innovation processes can be structured in a more or less rigid manner. Exponents of this stream are for example the Cooper Stage-Gate-Model (see COOPER, 1998), the Funnel Model (e.g. TERWIESCH & ULRICH, 2009), or the Open Innovation Process Model (CHESBROUGH, 2003). We consider that these concepts are barely sufficient for dealing with innovation dynamics (and sources) that cannot be regulated by a process model. This is not unusual within irregular business circumstances, or when explaining unpredictable social dynamics. However, in organizational innovation, irregularity is a typical variable. [2]

The second approach is based on cultural concepts. Exponents of this stream are for example the Schein Culture Model (see SCHEIN, 1992), the Sackmann Iceberg Model (SACKMANN, 1991), the Cultural Core Model (SACKMANN, 2002), or the Want Corporate Culture Hierarchy (see WANT, 2003). These models explain the relevance of implicit, more or less hidden, or invisible dynamics of innovation within social structures and organizations. It has been widely confirmed in theory and practice that companies can hardly access the tacit dimension of an innovation culture (e.g. NONAKA & TAKEUCHI, 1995). Neither can it be systematically assessed and completely explained by management initiatives alone. Even so, the hidden beliefs and attitudes about innovation and innovativeness massively influence the social processing of innovation projects. [3]

The topic of product development has been examined by Shona BROWN and Kathleen EISENHARDT (1995). According to them, the empirical literature about product development can be organized into three categories. The first of these categories is product development as *a rational plan*. According to this perspective, a product that is well-planned, implemented, and appropriately supported will be a success, on condition that the product has market place advantages, is placed in an attractive market, and is well executed through excellent internal organization. Selected studies from this category are e.g. Robert G. COOPER and Elko J. KLEINSCHMIDT (1987), or Billie J. ZIRGER and Modesto A. MAIDIQUE (1990). The second category of research is *product development as a communication web*. According to this category, external communications (with suppliers and customers) is critical to successful product development. Successful product development teams include gatekeepers, who encourage team communication outside of their groups, and powerful project managers who communicate externally to ensure resources for the group. Internal communication improves the development-team's performance. Cross-

functional teams that structure their internal communication around concrete tasks, new routines, and well articulated job descriptions, have for example, been associated with improved internal communication and successful products. Selected studies of this category are e.g. Debora Gladstein ANCONA and David CALDWELL (1990) or Deborah DOUGHERTY (1992). The third category is called the *disciplined problem solving perspective*. According to this perspective, successful product development involves relatively autonomous problem solving performed by cross-functional teams with a high degree of communication, and the organization of work according to the demands of the development task. An extensive supplier network coupled with overlapping product development phases, communication, and cross-functional groups improve the performance of development teams. This perspective also highlights the role of project leaders and senior management. There is an emphasis on both project and senior management; on the one hand, to provide a vision or discipline to the development efforts and, on the other hand, to provide autonomy to the teams. Examples of studies of this category are James P. WOMACK, Daniel T. JONES and Daniel ROOS (1990), or Kim B. CLARK and Takahiro FUJIMOTO (1991). [4]

Figure 1 developed an integrative model which summarizes the key findings within the literature Shona BROWN and Kathleen EISENHARDT (1995). The key to developing such an integrative model was the observation that the categories have complementary theoretical approaches. The organizing idea behind the model was that there are multiple players, whose actions influence product performance. Specifically, BROWN and EISENHARDT argue that the project team, the leader, senior management, and suppliers, all affect process performance (e.g. speed and productivity of product development); the project leader, customers, and senior management affect product effectiveness (i.e., the fit of the product with firm competencies and market needs), and the combination of an efficient process, effective product, and a munificent market enhanced the financial success of the product (i.e. revenue, profitability, and market share).

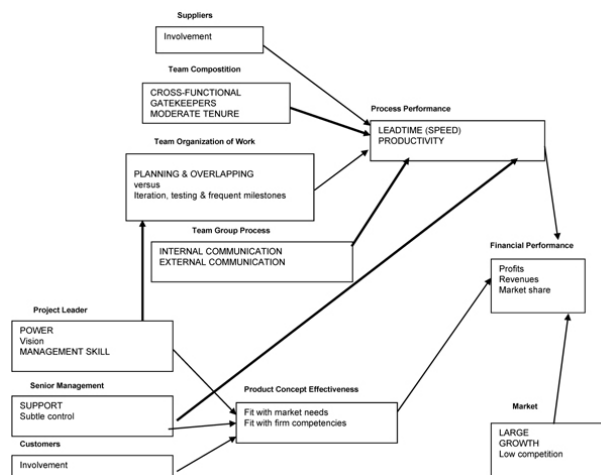


Figure 1: Factors affecting the success of product-development projects (BROWN & EISENHARDT, 1995)¹. Please click [here](#) for an increased version of Figure 1. [5]

1 Capital letters and thickened lines indicate robust findings .

In addition to the literature covering product development, our case was derived from a number of studies that focus on *entrepreneurship*, which helped us understand the challenges of start-ups during the development of innovation management capabilities. This branch of research assumes that entrepreneurs act as "opportunity takers" (SARASVATHY, DEW, VELAMURI & VENKATARAMAN, 2003). Sources of opportunities are structured along the locus of change, such as supply sources, ways and techniques of organization, and characteristics of products and markets (SHANE & ECKARDT, 2006, p.170). Other studies in the literature link the ability to take opportunity to personality traits. They suggest that people with a high tolerance for ambiguity, willingness to take risks, and a need for achievement become entrepreneurs (e.g. KHILSTROM & LAFFONT, 1979; WIKLUND, PATZELT & SHEPHERD, 2009) The strongest critique against this stream of literature focusing on the start-up processes only of young firms up to ten years in age. In these companies, the picture of the innovator as an opportunity taker might be adequate for conceptualizing a very important source of innovation. But for larger companies, there will definitely be other drivers which are missing from this literature stream. Additionally, large parts of this stream rely on quantitative data, which is not adequate for the study of cultural phenomena. [6]

The issue that seems to be generally missing in the literature is the description of the link between innovation culture and the innovation process. Classical innovation management tends to assume that ideas can be more or less easily generated (e.g. with idea management), or that they can be handled like a production process (e.g. by stage gate processing). This is, in large part, a positivistic and somehow dehumanized view of innovation management. Important questions regarding a company's corporate culture remain unanswered. For example, how and where did the idea originate, what role do individuals or groups of people play, and how will the power structure of the enterprise be decided? [7]

Our primary research question focuses on how basic assumptions of team members occur in consciously managed organizational innovation activities, and how they influence the effectiveness of the innovation process. Our early investigations failed to find any appropriate mixture of methodologies for conducting innovation management research involving the complex interplay between the innovation culture and the innovation process. This missing link is the starting point for our investigations in this paper. [8]

In order to answer the research question described above, we specified a multi-method research design and analyzed the development process of a new product of the telecommunications enterprise "TELE" in a single case study. In the case, we investigated the individual innovation dynamics as well as their impact on group dynamics and the resulting impact on the new product. Of special interest to our study were the interaction of innovation behavior and the corporate culture of the firm. In the literature review, we identified several studies where scholars accepted the invitation "to step outside the hegemony of [the] 'normal paradigm' and to consider alternative paradigmatic positions" (GRANT & PERREN, 2002, p.202). We contribute to this by taking the paradigms of general systems theory

(LUHMANN, 2000) and systemic social constructionism (GERGEN, 1985) into account. Thus, this case study basically interprets innovation from a constructivist perspective (BERGER & LUCKMANN, 1967; BAECKER, 2003; ADERHOLD & JOHN, 2005; MEISSNER, WOLF & WIMMER, 2009), which focuses on the social dynamics in innovation processes, and their impact. [9]

2. Methodology

We have chosen a qualitative approach which focuses on "building a complex, holistic picture reporting detailed views of informants, and conducted in a natural setting" (CRESWELL, 1994, p.2). Qualitative study focuses on meanings as they relate in context. Yvonne LINCOLN and Egon GUBA (1985) referred to the qualitative approach as a post-positivist naturalistic inquiry method of inquiry (ANTONAKIS et al., 2004). [10]

The present study was applied as a single case study. Robert K. YIN (2003) maintains that a case study is a research design "that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p.40). YIN also emphasizes the importance of having "multiple source[s] of evidence" to get a broad comprehension of the observed phenomenon. Thus, in this in-depth case study, the researchers have chosen different methodological approaches for the different phases of the project. Figure 2 shows the research framework in detail, comprising elements of contextual and cultural analysis.

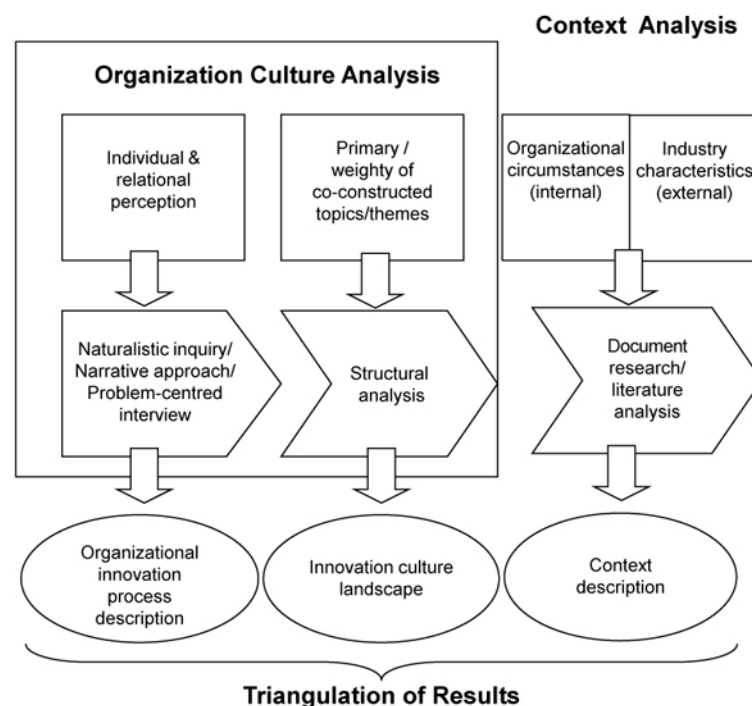


Figure 2: Research framework [11]

Due to our epistemological perspective we decided to use a multi-method research design that would cover contextual, procedural and cultural aspects within the case study. By this design, we should be able to identify critical interdependencies and communication patterns that give relevant insights into the relationship between innovation dynamics and the corporate culture. [12]

At the beginning of the project a context analysis was done. This was achieved by means of secondary research (document and literature studies) focusing on industrial characteristics. Additionally, the context analysis was extended to the company's internal context i.e. the situational circumstances. For this, we studied annual reports and several internal documents provided by the innovation project manager who served as gate keeper for the study. As a result, we got a detailed description about the characteristics of the industry, a detailed impression of the organization, as well as an idea of where and how environment and organization are bound together. [13]

The empirical data was collected in two waves. In the first wave we chose the technique of the "problem-centered interview" (WITZEL, 1982, 2000) as a method to access the narrated experiences of the participants. The problem-centered interview is largely a narrative interview, depending upon the strictness of the methodology. Whereas the problem-centered interview focuses on generating meaningful sequences, the narrative interview demands that the researcher reduces his own influence to a minimum. To this end, the interviewer can use a variety of interventions during the interview by, for example, asking reflective questions. Nevertheless, the problem-centered interview is basically concerned with generating narrative parts, as well as exact descriptions or ideological stances towards the problem. The researchers began by asking the interviewees to tell them how they personally experienced the project: in other words, they asked them for their own personal story. This established a comfortable atmosphere for the interviewees to tell the researchers their side of the story; one without any adverse consequences for them professionally. The aim was to gain verbalized experiences, which provide valuable clues on how the interviewee sees and constructs his world, thus revealing his or her "theories-in-use." Afterwards, the interview was fully transcribed so that the researcher could focus on the meaning of the spoken words. [14]

Throughout the analysis of the first wave, the researcher was guided by the following questions: What are the key issues in the innovation process and how is the process scheduled? Of course, during the course of the interview, one will discover aspects arising with which one is very familiar. The effect of this discovery on the research has to be acknowledged in order that he or she can move beyond looking *at* the other, towards looking *at* the situation through interviewee's eyes, i.e. from their perspective. One of the characteristics of this method is that there are no pre-formulated categories which can be used by the analyzer in order to process the interview. As a result, we got a list of extracted theoretical content through quotes from the interview material, as well as a process description. The analysis was conducted between August 2008 and April 2009. [15]

In the second phase, a "structuring technique" method was applied (GEISE, 2006). This method specifies a means of knowledge acquisition, where terms are grouped together, according to the relationship of these terms to others that have already been collected from the researched individuals (HACKEL & KLEBL, 2008). With this approach, subjective theories were clarified visually, enabling the (subjective) structure of the theory to be rearranged. As a result we were able to obtain the relevant content (terms, statements, etc.) and to deduce the relationships between them. The guidelines for using this technique suggest the following stages be followed. To assist researchers wishing to use this technique, a brief resume of the guidelines now provided. To depict the structure, cards are used on which the contents (terms, statements, etc.) of the theory should be represented. The guideline also defines how the cards are related together in a formal relationship. To indicate the character of a relationship, corresponding symbols are used (e.g. "=" means "equivalent to another concept"). Arrows could make dependencies and cause-effect relationships much clearer. This procedure makes it possible to create visible relationships between unique terms. The number of terms is limited to avoid being overloaded with categorizations. For our research the terms were selected by the research group, based on the interview results from the first wave. Limitating the number of terms is also potentially disadvantageous and to compensate for this circumstance we used a "carte blanche," which could be used to complete important details. [16]

The interviewee groups were presented with eleven terms written down on cards, which had been identified in the problem-centered interviews as central topics. The respondents reassembled the terms relationally. [17]

The relationships were clarified with the help of symbols. As a second task, we presented the interviewees with eleven statements, which they had to accept or to reject. The statements were based on the eleven terms. For example, we confronted the interviewees in a first step with the term "competition." This was followed by the statement, "the competition forces us to be innovative." As a final task, the interviewees had to place the statement into an ordinal scale. Afterwards, the conversation was also fully transcribed and the structure was recorded photographically.

Trigger Terms	Statements
External partners	External partners are important for ...
Cross-functional participation	For an optimal product development we should integrate as many business sections as possible.
Internal knowledge management	Often we do not use our internal knowledge in the company in an optimal way.
The company's autonomy	We are innovative because we want to increase our autonomy from the mother company.

Trigger Terms	Statements
Internal resistance	I use the customer need as argument when I am confronted with internal resistance against the new product.
Working in small teams	We unfold innovations in small teams in which we are very productive.
Product vision	It is important to believe in ideas with future potential, although not anyone in the company would agree to this.
Internal rules and structures	We have many rules and structures which tend to disturb our innovation process.
Support of (top) management	Without support of (top) management, innovations do not have a chance in our company.
Competition of providers	The competition forces us to be innovative.
Identification with the new product	Someone from us has to see a new product as his own baby.
Carte blanche	Carte blanche

Table 1: Trigger terms and statements used within the structuring technique [18]

For the analysis of the second wave we were guided by the questions: "what are the key issues within the structure," and "which aspects are more/less important"? As a result, we extracted more detailed theoretical content. Based on the list, we developed a process landscape which shows key issues and relationships between them. This occurred between July and August 2009. Thus, the whole process of data gathering and analysis took over a year to complete. The goal of the analysis was to find out the relevant statements, which could then give advice on the innovation process of the TELE. [19]

The conduct of the study was conducted on the classic quality criteria of validity, reliability, and objectivity (PETRUCCI & WIRTZ, 2007). Objectivity—in this research understood as the convergence of intersubjectivity—was ensured by the fact that results were always discussed within the research team. During the whole analysis process, a group of researchers regularly met to discuss and reflect on the results so far, to achieve a maximum degree of interpretive validity (MEISSNER, 2007). Finally, the criterion of reliability was maintained by use of the aforementioned structuring technique, which was completed in two stages. In the first stage, the concepts were supplemented by the statements made by the interviewees. Through ordinal classification, the research team could then check whether or not the concepts in themselves were conclusive, based on the network of relationships established in the first phase. [20]

In the following section, we will describe our findings from the case study as an illustration of the research framework. Later, we will reflect on the strengths and weaknesses of the methodological mix. [21]

3. The TELE Case: An Enterprise from the Swiss Telecommunications Industry

It is clear that innovation practices can be described and analyzed from multiple perspectives. For this illustrative case description, we apply the research framework and distinguish three basic views: context analysis, process description, and culture description. The analysis ends with the drawing of some conclusions. [22]

3.1 Context analysis

The case study was completed in conjunction with a major enterprise within the telecommunications industry in Switzerland. For decades the telecommunications industry in Switzerland has been a controlled monopoly market. With the revision of the Communications Law in 1998, the market in Switzerland—and in the EU—was liberalized. One of the reasons for this governmental change was the hope of various economic advantages to be realized. The legislature estimated that as a result telecommunication costs would be lowered and an additional wave of innovation would be spawned (ABEGG, 2005, p.76). Evidence shows that these goals were not too audacious and have indeed been met. With this liberalization, a number of telecommunications firms have entered the market. Since then, a number of better-priced, high quality products and services have become available (VATERLAUS, BÜHLER, TELSER & ZENHÄUSERN, 2004, p.10). [23]

The worldwide telecommunications market is characterized by very fast-paced technological growth. The dynamics of this market is further characterized by the technological convergence of the technologies of telecommunication, data communication and television. Today's telecommunications companies are offering a new mix of services to their customers which are increasingly being tailored to specific customer needs, usually in the form of a bundle of services. So it is not surprising that according to a study conducted by the University of Zurich in 2004, there still prevails a lot of above-average innovation activity still prevails (VATERLAUS et al., 2004, p.10). [24]

TELE is a subsidiary of a large foreign telecommunications company, but which operates more or less autonomously with respect to its daily business operations/decisions. For innovation projects in particular, TELE has its own allocated budget to develop new products and services. TELE has approximately 1,000 employees within Switzerland, distributed between several locations around the country. [25]

Until now, TELE has worked more or less in only one business segment fulfilling the needs of both business and private customers. The percentage share of the company's entire business volume for business customers amounts to a mere ten percent. This has a significant impact on the budget allocation for these two business units. Our study, therefore, observes innovation in a business unit which receives only a small portion of the entire corporate budget compared with the private customer unit. [26]

Based on the data collected, the innovation process could be reconstructed in detail and typical dynamics could be identified, which are shown in Figure 3.

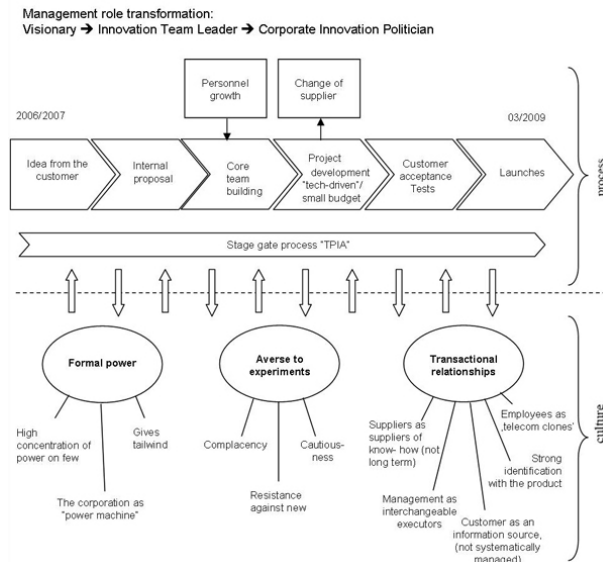


Figure 3: Reconstruction of the TELE innovation process. Please click [here](#) for an increased version of Figure 2. [27]

3.2 Process description

The upper half of the diagram in Figure 3 shows the different steps of the observed innovation process. The impetus for the development of the new product in this case came from an external source as the project arose from a conversation with an important customer. The customer told a segment manager at TELE that he would be interested in a new telecommunications solution, because the old one was too expensive. Based on the criteria set by the customer, an internal proposal was created. [28]

After they overcame the first stage gate, a core team was assigned to handle the development of the product. Two important criteria inform the utilization of innovative teams. The first criterion is that team members be drawn from a range of different and functionally important departments from across the organization. And secondly that, like the innovation project manager stated it:

“For an optimal use of know-how, it is also important, that the people from the different departments are part of the team from the beginning.” [...] (innovation project manager)

"If you don't have people that understand the business, and know how to use internal knowledge you don't succeed." (marketing manager) [29]

However, in the project team we observed, both these criteria were not met. For example, the marketing communication department should have become involved in the project much earlier than they were. As a result, the influence of this

department was minor, and the know-how was not used in an optimal way. The reason for this late involvement lies in the internal process schema. During the whole development process there were several stage gates to overcome. According to this internal process scheme, the marketing communication department does not get involved from the beginning. Possible influences and improvements from this department's perspective were therefore not possible. One member of the marketing communication department states:

"To some extent there are certain process cycles and milestones, and the marketing communication department becomes involved at a much later point in time. [Also] we are not involved from the beginning of the project, and therefore, our input is rather limited. [Additionally], the project has been protracted over many years now, and yes, well, the influence that I have had on the project itself, is almost nonexistent. This is because this is the way the project was designed from the beginning." (marketing communication manager) [30]

Also noteworthy is the fact that TELE experienced several staff changes during the life of the project. These changes were made both to the development team, and at the management level. This lack of staff continuity was assessed by various stakeholders of the project as being problematic.

"Change is another problem if you spend two hours explaining [how things work] to a guy, and then six months later he's gone, and there's a new guy." (marketing manager) [31]

In a broader sense, the customers are also a part of the development team. Before the launch of the product, there was a phase of customer acceptance tests. This step can be regarded as a trial-run, where the products were tested and improved. [32]

During the development phase, TELE worked together with an external partner (a supplier of technology) thereby, saving much time and money by obviating the need to develop these skills/competencies internally.

"External partners are really important when considering the time-to-market aspect of things, as we don't have to build up all the knowledge and technology, which the partner already has. Instead, we merely have to integrate it, which first of all gives us a major head start on the project. Alongside the time saved, we also receive the external partner's services, which bundled together result in an interesting package." (partner manager) [33]

Collaboration with an external partner brings with it not just advantages, but also inherent dangers. One example is when the external partner becomes so crucial that he is indispensable in the future. Problems can occur due to technical barriers, or if the levels of skills promised are not made available, as described in principal-agent theory (JENSENS & MECKLING, 1976). This is precisely what happened to TELE with the result that the original partner had to be changed because they did not have the desired know-how to finish the job. This change

cost TELE much time and money although the new partner was quick and competent. [34]

3.3 Culture description

Based on the data, three prominent cultural influence factors could be identified: formal power, aversion to experiments, and transactional relationships. These will now be described in detail [35]

3.3.1 Formal power

The analysis of the process has shown that formal power is the most important factor during the whole process. Without the top management acceptance, innovations are doomed to fail from the beginning, as it is the board of directors that holds the responsibility for the allocation of resources.

"Without the support of top-management, innovations don't have any chance in our company, which is true, we have, we need to, we have to tell them this is something that we really need, and we have to convince them what is the benefit of this, because when they are not convinced, your project will just be put on the side."
(telecommunication engineer) [36]

Formal power in TELE is devolved, with only one authority, organizationally linked to top management, deciding which innovation projects will be carried out. This situation, whereby power is highly concentrated with a few individuals, is a decisive influence on innovation processes in TELE. According to the people involved the most difficult part was not the product development process itself, but the difficult task of persuading and assuring senior management that the innovation was of strategically "fit" for the company.

"Because the technical part is not the difficult part, it is the, I guess the process part which has taken us the longest." (telecommunication engineer) [37]

However, once senior management pledged its commitment it provided significant momentum to the entire success of the project. [38]

3.3.2 Aversion to experiments

The innovation project also included the development of a new business segment, or strategic business unit (SBU). Although senior management were totally supportive of this development, it was received with a good deal of resistance by the employees who would be most affected by any changes. As a first step, it was essential to gain the acceptance from these employees that the creation of this SBU represented the dawn of a new era in the company. Three members of the project team were given the task of pushing the product development process to a successful completion. According to the people interviewed, this is another prerequisite for the successful completion of innovation projects.

"[...] that two flag bearers were needed to bring the project forward." (department manager) [39]

As previously mentioned, the customer is also a part of the wider development team. He is also very influential in winning over management support. If there is internal opposition against the new product idea, the customer, or rather the customer need, is a very strong argument to push it through the stage gates. This strategy is often used by the employees of TELE. One project member states:

"The customer was for me the steamroller/inspiration for me to go ahead in these times. The customer wanted this [product] and was really interested, and wanted to buy thousands of units as soon as the solution became operational. This appeal for the product was immediately internalized and transferred to the marketing segment." (department manager) [40]

Reservations about the new product were not only limited to the senior management with the sales department also expressing resistance. An important factor in gaining the support of the sales team was the running of regular product training sessions to increase their understanding of the product's features. Without this knowledge the sales team would simply not attempt to sell the product—a form of passive resistance.

"We have regular sales training, and we also have an internal sales training department. In conjunction with the marketing manager, the sales training is setup and the sales team is instructed to focus on the benefits and the key factors, so that they are communicated in the best possible way to the customer." (pre sales manager) [41]

For the salespeople, selling the new product must also be worthwhile in a financial sense. Therefore, giving them the proper incentive to sell the product is also a consideration.

"On the one hand, you can have a really great product, but if you don't properly motivate your sales staff by giving them the proper incentives to sell the product, then they simply won't sell it! They will only sell something that will pay off for them. In the implementation phase, these kinds of things are crucial. You have to think these things through before-hand, otherwise they just won't work. If there is some sort of a hindrance then it won't work." (department manager) [42]

Unsurprisingly, the people in the development circle were not resistant to the development of the new product. They were very motivated to get away from only the one-segment business model which the company had been focusing on. The certainty of entering new terrain seemed to be a positive thing.

"And the employees, here at TELE are actually really motivated, and also wanted to, so to say, get away from only working in business segment X." (solutions consultant) [43]

3.3.3 Transactional relationships

As mentioned earlier, the idea for the innovation was not an internal one, but rather an idea from a customer. During the whole process, the customer had an important role as a supplier of ideas, by providing arguments for the implementation of the project.

"I am also even talking to customers, so I am actually also implementing part of the functionality, and then they give me input, and I am also discussing with different vendors to get ideas on innovation." (product manager) [44]

Even though the customer is an important part, they are not systematically managed. The relationships are more informal, and dealt with by personal contact of the various sales people involved. [45]

For the development, TELE worked together with an external partner. The relationship with this partner is not considered to be very strong, so there is no interest in building a long-term relationship. The relationship is more results-oriented, in the sense that they are merely a supplier of know-how, which TELE lacked, and which thereby helped them reduce their time-to-market for the product.

"External partners are important. If we don't have the capability to [complete the job] ... the external partners are important for the technologies we don't [yet] have.

I: Ok this is the only reason?

B: If it was for me, I'm not going to be using an external partner because this is something that you don't control, I am a control freak, I would want to know what happens, and you are always, external partners, unfortunately are there if you don't have the capability to do it, and then but there is also the problem, that depending on the partners, product might be ok, product might not be ok." (telecommunication engineer) [46]

Within the core team, a very strong identification with the new product takes place. According to the interviewed people, this was a significant factor within the undertaking, which allowed the development process to be concluded successfully.

"But then, for us, we are quite happy that we finally have this product, so that we will have something to offer, [that is] new to our clients, we really believe strongly in the product, and we hope that it will fly sooner or later." (telecommunication engineer) [47]

3.3.4 Conclusions from the TELE case

In summary, it is striking that a development process in TELE was characterized by skepticism and formal power. Innovative people need to have not only creative abilities, but also diplomacy and sales skills. As a first step, an innovator needs to persuade the management board of his idea. This is the most important step in the whole process because the management board has the authority to approve

or deny any undertaking the firm is involved in and, thereby, also sets the budget for it. Thereafter an innovator must provide the sales team with a thorough understanding of the product's benefits, so that they may in turn sell the product in the most effective way to the customer. While carrying out the project, it is important that the innovator push the development in the right direction. A manager has to be a visionary, a team leader, and a politician, all at the same time. [48]

4. Discussion

The findings from the TELE case confirm many of those discussed earlier (see Shona BROWN and Kathleen EISENHARDT (1995). Most of the factors mentioned in their model were found in the innovation process at TELE (e.g. management support and the power of the project leader). The element missing from their model was the incorporation of "corporate culture." As we have shown, the "aversion to experiments"—a cultural issue—had a strong influence on the whole process which can be observed from the resistance against the new product. Further important issues were the "power culture," which made the whole process unnecessarily prolonged and more complicated, and the transactional relationship nature of the partnership with the technology supplier. This demonstrated that throughout the whole process, there was little interest in building long-term relationships as the culture in TELE was very goal oriented. [49]

While there appears to be an emerging realization in the management theory literature regarding hybrid forms of inter-firm innovation (e.g. ALMIRALL & CASADESUS-MASANELL, 2010), management education seems to be severely lagging behind. An internet search for the term "dynamic innovation management role models" (and others similar to this) offered no helpful information for research and practice. This discovery provides the empirical finding of our research. Thus we recommend that future studies concentrate on applying the academic theories outlined in this paper with the aim of transforming management practice. Obviously, this is an ambitious aim, but we see no other possibility to adequately appreciate the skilful practice of innovation management which we observed at TELE. These practices brought together artful and mindful combinations of interdisciplinary management skills which enabled innovation to proceed in spite of the powerful internal barriers that the company tried to set up. [50]

In reference to the methodology, we consider the multi-method mix to have been an appropriate tool to identify and uncover the diverse interrelations and dynamics within the case study. Significant value was gained by the problem-centered interviews due to their multifaceted function. They served as a lens for examining the innovation practices/dynamics, as well as an instrument to gather a process description through the eyes of the real-life participants. By combining the findings from the different methods it was possible to reconstruct the TELE innovation process with the cultural themes as shown in Figure 3. However, some basic problems remain, the main ones being as follows: [51]

Firstly, mixing methods meant producing increasing amounts of data. During the ongoing research process, a main challenge was to maintain a specific order and logic to our data. On the one hand, specific findings (for example from the contextual analysis) had to be compared with other findings (for example from the problem-centered interviews) for triangulation purposes. On the other hand, there was a need to maintain a natural interpretive flexibility to advance in the research. [52]

A second problem was encountered when trying to weight the different methods equally. In our case, the problem-centered interview was considered to be the primary tool. However, whilst the structural analysis helped us get a better impression of the problem, it mainly served to validate the interview findings. We consider that the research design meant that the structural analysis remained regrettably under-used, as it could have served a better and more influential purpose overall. However, the question of arranging and prioritizing the different methods has been in discussion in multi-method research for a long time. And academic discussions further show that this problem cannot be solved without taking the respective research context into account. In the TELE case, it made sense to stick to the problem-centered interviews and to validate and enrich the findings with the results of both of the other analyses. [53]

Thirdly, the mixed method approach took a lot of time. The research team spent over a year, from the beginning of the context analysis to the final interpretive steps of the dissemination of results. By the time the researchers were ready to present their feedback and central results to the participants, the whole company context had changed. Due to a strategic calculation, two competitors announced a merger, mixing up the market conditions of the relatively small Swiss market. Thus all current management activities were put under scrutiny. Furthermore by that time, a key stakeholder was no longer around, thus limiting the application of our research at TELE and the potential for continuous improvement of practices. Therefore, through the combination of changing industry-specific factors together with the cumbersome nature of our research design, the hoped-for effects from our research were much reduced. This was the first time that the research team had experienced such an unsynchronized pattern of events. The challenge now is to identify an adequate context for validating the entire research process. [54]

In summary, our research comprised an effective mix of methods that remain open for improvement in future projects. The basic problems of multi-method research, like the immense growth of processable data and empirical information, remain, as does the question of how to weigh and prioritize the methods used. As an applied social science project this research into innovation management is intrinsically limited by its subjective perspective and interpretive angle. A further validation of the whole research process by practitioners is necessary therefore to ensure the validity of our findings, but not the value of the research framework itself. [55]

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