

MAKING NONSENSE SENSIBLE

DEVELOPING CROSS-INDUSTRIAL PRACTICE IN THE FOOD SECTOR

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ABSTRACT

We have investigated the making of new practices between established practices, arguing that our findings add to practice-based studies in three aspects: First, whereas boundaries between practices often are taken as rather stable, we illustrate how boundaries are (re-)made, situated and contingent. Second, we show how new practices may emerge through making sense of the 'space between practices', and how challenging it may reconfigure knowledge from different fields of practice. Third, we show how power come to the fore when established practices are challenged, and how the 'system' of interconnected practices configuring an 'industry' enables and constrains innovation processes.

Keywords: innovation, practice, food

1 INTRODUCTION

This paper addresses how we can understand change of practice in the intersection between two related but still fundamentally different fields of practice. We argue that the food sector is an underresearched field in organisational studies, despite the fact that it consists of a rich variety of social and sociomaterial issues challenging our senses, where sight, smell, taste, texture, and perception has to be technically stabilized and then accepted by users. We have conducted an ethnographic study over three years of how an agricultural food corporation strategically explored opportunities for innovation between agriculture and aquaculture. The idea being that their existing "knowing in practice" (Orlikowski, 2002; Nicolini et al., 2003) could provide competitive advantage when entering a less industrialized although fast growing sector, namely the fish industry. We further describe the practices of boundary crossing researchers and a fish farm, and how they took a leap into the unknown domain between fish and agrifood, in an attempt to make, or we could say *create*, sense of what for outsiders looked like nonsense. The paper describes how lack of knowing in practice, both about the other industry's practices and markets, was sought compensated for through external partnerships and numerous rounds of trial and error in relation to new materials, technologies, organisations, and customers. The following learning and innovation processes thus became relatively painful with highly uncertain outcomes, where existing

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and new relations and practices were challenged, within own organization, between different organizations, and between actors from different geographical locations. The emerging product of the process, Salma Cured, a salmon 'salami', produced via an advanced adaptation of salami technology, became boundary object (and outcome) of an innovation project. But its ambiguous status was rather problematic, and became increasingly more problematic the closer to the end-users it got. A redefinition of existing associations and relations is not always possible, but will often determine the fate of new practices.

Innovation is often understood within practice based studies simply as 'change of practice' (Tuomi, 2002), requiring reconfiguration of social and technical relations (Nicolini, 2007). Brown and Duguid (2002) use epistemic cultures (Knorr-Cetina, 1999) as a typical example of networks of practice (NoP), in which knowledge flows easily internally, while much more difficult across NoPs, thereby mainly explaining how already successful NoPs work and are reproduced. In our case we see how the new food production practice was fundamentally about establishing new practice *between* existing practices, such as R&D centres, marketing departments, distributors, and even consumers in their kitchens. This thereby extends Tuomi's definition since in cases of radical innovation it might be as much about establishing new practice as about changing the existing. This is also emphasised in Mørk et al. (forthcoming), highlighting the power dimension, learning problems of 'experts', fragility and the open-endedness of such processes. On this background the following research question is investigated in this paper: How can we understand/make sense of innovation processes attempting to establish a new practice *between* actors and networks that not traditionally have been collaborating? From our study we suggest that this, fundamentally, is about connecting practices (Håkansson, XX), hence also reconfiguring them (Nicolini, 2007).

The article is structured as follows: It begins by reviewing some recent contributions on this topic. It then outlines the methodological approach before turning to the case. The discussion relates this study to previous studies, and highlights its theoretical contributions. The paper ends with some concluding remarks on implications.

2 KNOWING IN PRACTICE AND INNOVATION

Theoretically, we position our paper within the emerging literature on practice based studies of innovation (insert references), making new practice by connecting and reconfiguring interconnected practices (Gherardi and Nicolini, 2002; Nicolini, 2007). In particular we have studied cross-domain innovation (Howard-Grenville and Carlile, 2006), and suggests that the notion of 'systems of interconnected practices' might help expand our perspective on domains/fields of practice, such as an industry. How such processes are influenced by the involved domains' knowledge regimes, as well as their social, economic and technical relations. This also pinpoints the complexity of different boundaries that has to be handled simultaneously. Moreover, while many studies of boundary organising have investigated coordinating efforts, this is a study of an attempt at establishing new/hybrid practice – a profitable business based on practices from two significantly different domains.

2.1 Knowing in practice

We understand innovation as 'change of practice' (Tuomi, 2002), and to analyse our case, we use the 'practice-based' perspective. In particular the emerging literature on interconnected practices, networks of practice, and innovation (Gherardi & Nicolini,

2002; Brown and Duguid, 2001; Swan et al, 2002; Ormrod et al, 2007). Brown and Duguid (2002) use epistemic cultures (Knorr-Cetina, 1999) as a typical example of networks of practice (NoP), with easy knowledge flow internally, while much more difficult across NoPs, thus mainly explaining how already successful NoPs work and are reproduced. However, we focus exactly on the challenging process of working across practices. Knowledge is seen as performative, as “a dynamic and ongoing social accomplishment” (Orlikowski, 2006; 460), emphasising the emergent, embodied, embedded, and material dimensions of knowing (ibid), and hence enabling a dynamic account of the practice of innovation. The material aspect of practice is emphasised, that knowing/practice is material, in line with Latour (1999, 1987), Law (1995), Pickering (2001), Akrich et al. (2001).

2.2 Boundaries and innovation

Orlikowski (2006) advocates the inclusion of materiality in studies of knowing, both of boundary objects, and of other hitherto unexplored material aspects of knowing. Barrett et al. (2007) have studied “the role of technological objects in shaping boundary relations within organizations” (2), identifying how “spatial, temporal, task and role aspects of workplace boundaries” were affected by the introduction of a new technology, and viewing boundaries as dynamic and emergent (see also Hernes, 2004). According to this study, previous research on technological objects have been occupied with “cross-boundary coordination of work between different occupational groups” (3), taking boundaries more or less as given and stable. Less emphasis has been put to non-consensual boundary relations, investigating the ongoing change and maintenance of boundaries. Although drawing on these studies, our study differs in a specific respect: Our focus is neither on how objects coordinate cross-boundary work, nor on how objects may (re-)shape intra-organizational boundaries. Rather, we have studied how boundaries are challenged and re-shaped across fields of practice (interorganisational and cross-industrial) by exploring and establishing new practice between existing fields of practice. The development and commercialization of a hybrid technological object served as the common object(-ive) for the participants, becoming the carrier of a common vision of breaking with the limitations of existing ‘systems of interconnected practices’ (ie industries).

2.3 Cross-domain practice² reconfiguring interconnected practices

Departing from much of the literature on ‘networked’ innovation, in our case we see how the new food production practice was fundamentally about establishing new practice both in/between R&D centres, in the interface between marketing departments and distributors, and even in the kitchens of consumers. Gherardi and Nicolini (2002) have done important work on the dynamics of interconnected practices; on coordination between dissonance and consonance. But there is in their study no account of the interconnecting – the relational emergence – of practices, how they came about in the ‘first place’. So, we understand radical/cross-domain innovation processes as attempts at establishing new (common) practices between actors and networks that not traditionally have been collaborating, and which are characterized by mutual learning in several sets of relationships (Hernes 2007; Pickering, 1995; Schatzki et al, 2001). Such boundary-crossing and networked practices go beyond what Knorr-Cetina (1999) has described as ‘epistemic communities’, as they force the involved actors to re-evaluate their own knowledge (Wenger, 2000). Moreover, they demand a relatively extensive ‘mixing’ of knowledge from different fields via recombination and translation (of knowledge, technology, relations, capital, etc), and often also reconfiguration of socio-

² The term ‘cross-domain practice’ is adapted from Howard-Grenville and Carlile (2006).

material relations. By the notion of 'systems of interconnected practices', we may 'stretch' the networks involved in shaping and maintaining practice, in order to understand the complex socio-material relations forming a field of practice, such as an industry, from a practice based perspective.

Howard-Grenville and Carlile (2006) emphasise the incompatibility of knowledge regimes and the consequences of the material world for cross-domain work. They criticise previous practice based research for not taking into account the costs (unintended consequences, that is) of integrating knowledge across boundaries, in particular related to incompatible knowledge stemming not only from different interests and goals, but also from differences in material properties and collective conventions across practices. They suggest the notion of knowledge regime, defined as "the nested connections between the material reality engaged by work practices, the work practices themselves, and the larger collective conventions that reflect and account for the appropriate use of such practices" (475). From this, it might also be possible to understand better the "relative power of one regime over another and identifying sources of incompatibility" (475). Boundary objects may fail to facilitate common practice due to such differences beyond the work practice level (482). Moreover, differences in "the conventions used to measure success" may lead to incompatibility of knowledge across knowledge regimes. This resembles Stark's (XY) discussion of the role of 'evaluatory principles' in framing and shaping practices. Howard-Grenville and Carlile further discuss how material properties may enable (or hinder) (re-)production of work practice and industry conventions, which again may enable accumulation of knowledge over time and hence a "continued exploitation of the material properties" (483). Drawing on this study, we analyse the development of cross-industrial practice both related to the established industries' knowledge regimes, but also to their established system of interconnected economic, political, and material practices.

3 METHODOLOGY

Case studies are well suited when real-time events and processes are not easily distinguishable from their context (Yin, 1994). Many previous studies focus on discrete episodes of the innovation process. In contrast to this we have investigated the entire process of a project. Our research material was constructed through participant observation, semistructured interviews, and document analysis. The first author has followed the organisation over 3 years (from 2004 until 2007) as a PhD student. This study is part of a larger study in which we conducted in total 33 semi-structured interviews with members of all groups (repeatedly with some 'core' participants), and studied internal documents and publications. Participant observation was mainly done over a 6 month period, partly in headquarter offices and partly in R&D facilities. In addition, there were five field trips of two days or more, to other locations such as food fairs and production facilities together with project managers. The interviews focused on innovation in specific projects, and their connections to overall discourses on business strategy, politics, and science. The quoted informants appear with a combination of professional background, number and affiliation. All interviews have been fully transcribed, and thereafter coded in two rounds on the basis of emerging topics and organised into matrixes to get a better overview and to search for 'patterns, contrasts and paradoxes' (Coffey and Atkinson, 1996). Our approach was largely inductive, nevertheless significantly shaped through the interplay between theory and the research material. As writing the case study was an iterative process, we revisited our research material several times. During the writing, discussion, review and rewriting

process the focus became clearer, and accordingly the sense we made of the research material changed.

4 A CASE STUDY OF INNOVATING FOOD

This is a study of a large dairy cooperative, DairyCo,³ redefining itself as a ‘food corporation’, opening up for strategic explorations of biomarine innovation. We report from a longitudinal study of a cross-domain project, in which a well established technology from the agro-industry, fermentation, was sought applied to fish in novel ways, resembling a kind of ‘fish salami’. The resulting technological and commercial challenges, in addition to challenges of sharing, translating, and combining knowledge in interorganizational networks are highlighted.

The case is divided into three parts. The first part emphasises the attempts at individual/intra-organizational development of practice with resources from another field of practice. Second, we emphasise how the actors sought to strengthen their competence and access to resources through seeking strategic collaboration and partnerships with researchers and an industrial actor from the ‘other’ field of practice. Finally, we emphasise the expansion of collaboration through networking with potential market actors. This is partly coherent with the chronology, and it allows us to outline three different approaches to establishing new practice within the same case: (1) Appropriation of resources from another practice, and combining it with own knowledge and resources. (2) Strategic collaboration to jointly create new practice between existing practices. And (3) a more open networked attempt at mobilizing and reconfiguring a set of interconnected practices.

4.1 Independent development of a new practice

The enthusiasm for this hybrid, leading DairyCo to buy the idea (a patent application) from a food scientist, derived for the most part from the technical and biological problems it promised to overcome:

“To bind the fatty acids in fish, right, was very exiting, to master something new in this way I think triggered a lot, but at the same time we saw that there had to be some opportunities in the market for this” (marketer 1).

The opportunity to work on a novel technology motivated the R&D team. A project team for the product development project was established, as the formal starting point for technical development, conceptualization, and market research. With the formalization of the project, it got fresh resources for working on two interlinked processes. First, continued and strengthened technological exploration and development, exploring the technological opportunities and developing the feasibility of the technology and recipe. Second, exploring and sketching a product concept by seeking knowledge of consumers and their reactions to the product. However, when taking ownership to the invention, the further innovation work was moved in-house, breaking off collaboration with expertise on micro-biological technologies, due to lack of “trust in doing these experiments at FoodInstitute” (corporate director), wanting to protect their knowledge from competitors. This had consequences, both increasing development time of the product, and uncertainty in moments of deciding on the further direction.

³ Company names have been substituted.

On the industrial side, the search for potential partners started early. Even so, their main conclusion emphasised that: “the group considers partner search as less important than the product development.(...) Without a physical product, negotiations with potential partners become shadow boxing.” (project meeting summary). But regarding product development, then, where do you start, when both the product and its market are unknown from the outset? The inventor reflected on this challenge: “this sausage came into DairyCo the wrong way. In reality it came the right way, but how do you manage to get a knowledge product into the marketing department?” (professor). It was a lot more difficult to mobilize the marketing department for shaping a product that far from their existing set of food categories. Still, there were several benefits of doing everything inhouse. Firstly, increased flexibility from being able to produce whenever one wanted, independent of available capacity in the FoodInstitute labs. Secondly, economic arguments were mobilized. Thirdly, it was argued that it was improving the protection of new knowledge from the supposedly more open environment at the academic research institution.

It was a precondition from the start to mix white and red fish in the recipe, as it would both be cheaper and technically easier to produce. But due to too low quality on available white fish, it became difficult to stabilise the product technically, and the resulting greyish colour was hard to associate with a 'gourmet product'. Finally, in the conceptualization and naming process they could not take into consideration things that hinted too much towards salmon. After 2-3 years of research, the product developer could be quite specific about the transfer of meat technologies to fish. While the bacteria culture worked in the same way with fish, and the following pH and drying processes too, the process of binding fat was a lot more complex than with meat. They had to control the fat content strictly, add proteins to encapsulate and stabilize the fatty acids, and follow strict routines on hygiene. One reason for this was that they could not produce a single batch of fish salami without getting it covered by mould in the drying facility. Those responsible for product development in that phase told about a period of six months as extremely frustrating, before eventually managing to fix the problem. Four intertwined problems had to be solved before managing to produce the fish salami with the expected nutritional quality and to avoid mould attacks. Hygiene was the main issue at play. Cleaning had to be done with extra care, and the other issues were more or less related to this. Secondly, there was a bakery laboratory next door, hence having more spores from yeast and mould in the air that created trouble for the curing of fish. Thirdly, the drying facility had to be adjusted to make work optimally regarding moisture. It was contested among the participants if this had anything to do with the mould problems, but all agreed that it nevertheless was something that needed to be done. Lastly, the supply of – especially white – fish was a big problem.

In their earliest commercial analyses, the team emphasised the inherent paradox of making a mixed and cured product of fine raw materials, potentially not being perceived as 'premium quality' by consumers. Still, it was described as a product fitting with Asian and European food trends, to be used up-market as pre-course, snacks, or sandwich filling (Strategy doc no.1). A few months later, a first sketch for a marketing plan was written. 'Curiosity and health' were mentioned as the main triggers for customers, linking the product's content of omega 3 to the growing health trends within food, and in the business plan from the same period, a success scenario was described:

“It was a real innovation... We knew that if we could manage the idea right, we would be able to launch a unique product concept. Not just in Norway, but also internationally” (from 'Business plan').

Here, a mass market was projected, imagining how the ‘salami’ would become an everyday product ‘on all breakfast tables and in all sandwich outlets’. No up-market associations to pre-courses in restaurants, or for special occasions in well educated homes, and no traces of the ambiguity of market segments, product identity, and technology evident in the earlier notes, and that still followed the project throughout its lifetime. Despite the commercial basis for the corporation, this project represented nothing but uncertainty when it came to potential customers:

”But it was a recipe for something we didn’t know what would become. It was called fish salami, but what on earth could it be used for?” (marketer 1)

Integration of development and marketing was thus depicted as both necessary – for understanding and meeting the user demands, and difficult – for the lack of methods for involving users before having produced ‘something concrete’ to represent the project. This dilemma led to a rather defensive strategy related to industrial customers (e.g. retail), as they “had not come far enough to dare contacting the retail chains” (marketer 1). Nevertheless, unlike other sites of research, an industrial organization necessitates a business focus so the project group went out travelling, to Italy, Belgium, Japan and South Korea to learn about their ‘food cultures’, and test their responses to very early versions of the product.

The intention of drawing synergies from their existing competences and technologies in the DairyCo system, proved more difficult than anticipated. The problem was a lack of ability to mobilize interest from professional groups, whether marketing, management, or technology, for helping out when needed. And in this phase the project seemed to lack direction, cooperation among those involved, and the form, taste and quality of the product were contested issues.

“It has been a big challenge, when four professional groups are to have their say.”
(project manager)

“I think we talked about the same things, but we couldn’t understand each other”
(product developer)

Cross-disciplinary work is often challenging in terms both of communication and of interests. In this chaotic period the technology and the recipe were developed into something more presentable on a number of parameters. On other parameters, they gradually realised that they needed to strengthen their internal knowledge:

“We quickly discovered that we needed more competence on fish (...) and we needed more from a marketing perspective.” (marketer 1)

Acknowledging the need for strengthening their specific knowledge of fish, they hired a university research group with expertise on processing fish. Having worked on improving processing technology for fresh salmon for many years, mainly together with a fish farm, this group had easy access to ‘prerigor’⁴ raw materials of superior quality. Followingly, two of the new researchers succeeded in their informal experiments with fresh salmon in addition to the ‘official’ experiments still using frozen materials.

⁴ Prerigor means processing the fish before it becomes ‘death stiff’, hence getting very fresh filets of extraordinary high quality.

Summing up they quested for high quality raw materials, i.e seeking to control the practice of suppliers, while simultaneously maintaining the ambiguity of meaning of the innovation. Gradually, learning what specific knowledge from the other domain they lacked, they started supplementing the team by hiring aqua-culture scientists and product developers. The choice of new partners, in turn, influenced the subsequent direction of the project. By teaming up with partners on the supply and production side, and not with any actors closer to the users – such as distributors, they managed to stabilize a number of technical issues, but had problems moving the innovation closer to commercialization.

4.2 Changing practice through collaboration

Getting surprisingly good results with the pre-rigor salmon, the problem of controlling raw materials was solved, and the fish farm was recruited as partner in the project. But the formalization of the relationship with the fish farm underscored one of the basic differences between agri- and aquaculture: micro-biological knowing in practice. In order to gain full advantages of their excellent fish in this project, dairy practices had to be transferred to and integrated with the fish farm's production practice.

The differences between aquaculture and agriculture related to 'culture', competence, and economic/market systems was frequently mentioned by the participants. However, when coming to collaboration between researchers from DairyCo R&D and the processing staff at the fish farm, communication seems to have been working without much frustration. This does not mean that differences had disappeared, but rather that some communicative features were in place between these groups from the long history of collaboration. DairyCo. However, to formalize a partnership, different interests had to be negotiated:

“The task in the beginning was to develop trust to us (...) It was a lot of arm-wrestling, on how things should be, they had many other interests to be integrated in the agreement, on both raw material prices, on growth – capital for growth, and other things, where DairyCo has the opposite point of view” (director, GH)

“They are more concerned with (...) creating jobs for many people, and running a long-term industrial business [locally]” (director, GH)

Different interests and little knowledge of each others made it necessary to build trust, and explore if their different aims would go together. Not only sectoral differences, but also organizational and historical matters had implications for the negotiations. Moreover, for DairyCo to negotiate with the 'private money' of the fish farm owners in a risky project was challenging. The interests of the local family business and the large corporation were different. Nevertheless, they succeeded in negotiating an agreement of a strategic and long term alliance, and the work of establishing production practice at the farm could start. Technologically, there were efforts to make the innovation reliable and controllable. Choices between viable alternative technologies had to be made, and the chosen technologies had to be made more robust to stand the transfer from small scale laboratory production into large scale industrial production.

The pre-rigor technology represented high-end knowledge on processing fish. Scientific knowledge, already implemented in practice, technologies and routines. So, when people in DairyCo told of the lack of knowledge in the fish industry, they really talked mostly about their own fields of expertise, such as microbiology (fermentation, hygiene,

etc) and marketing (distribution, branding, etc). But on raw materials, DairyCo here bought access to state of the art technology. Accordingly, the fish farm's interest in this joint project was the prospect of transforming their own technology into economic value – which they so far had not been able to on their own.

When the UNK project team arrived at the fish farm for the first test production of Salma in large scale, the facilities were not yet ready. Programming and adjustments still remained, and they had discovered that they lacked the right type of cleaning agents for the drying facilities. Production personnel were taught about micro-biology, how most bacteria thrive at 20-40 degrees, and surviving cooling, but dying from temperatures between 72 and 100 degrees. Bacteria were participants in the Salma project, and it was crucial for success that they acted as they were supposed, and it was challenging to succeed with recruitment, development, and good treatment of them. At the time, it seemed both chaotic and calm, with a lot of people passing through the production hall, some just checking on the progress, while others being more or less involved in the event, all with appropriate sterile white clothing, caps, and clogs. The result was a pink salmon 'salami' in opaque black sausage skin, to be hung in the drying and smoking facility to mature during the following weeks.



Picture 1: Salma Cured

The transfer and upscaling of production from the dairy lab to the large scale facilities at the fish farm was done during the summer of 2004. But then, a few weeks later, problems occurred. Suddenly the whole batch was attacked by mould and had to be discarded, and overnight the harmony was gone. A white layer of mould had invaded every salami in the drying facility. This was also challenging for the marketing people that had already started presenting the product for various international customers. Just weeks before the first 'marketing tour' the little devil of a micro-organism re-appeared. The mould was discovered by a production worker:

“It was mould, and we washed down the sausage four or five times, but in the end we had to dispose of it, everything, a whole production. (...) I really don't know how it started, but it spread incredibly fast.” (production worker)

She had a theory of it stemming from the grind, but the managing director was of another opinion. It was rather “a failure in the routines that did it”. DairyCo technologists went into several new rounds in teaching and controlling the production workers at the fish farm to secure a more stable and predictable production. Eventually, they agreed that the reason had to be lack in the maintenance routines of the machine and not being strict enough on the routines on hygiene. Even though both issues were described in the work manual, they had obviously not yet been established as stable practices by the local workers. However, through this reinforcement of the new

standards and routines, the problem disappeared and did not re-appear in later productions. This later mould accident should not have been too surprising for the DairyCo people, as their own people had spent six frustrating months fighting mould in the their own laboratory. Unfortunately, it had all been forgotten in the black-boxed history of UNK.

The next technical task was to improve the practice on some more aspects of microbiology. In contrast to the fish industry standard of maximum bacteria count of 10.000 per gramme, they managed to decrease the bacterial concentration to below 1000 bacteria per gramme after the salmon was ready processed and packaged. Hence, they could guarantee the quality of the product within a minimum shelf life of 10 days, producing economic and organizational advantages related to logistics and consumer experience. This was achieved through systematic collaboration over several months, both with the production personnel, the cleaning personnel, and the management. The commercialization manager also told how he at a couple of occasions had to rush out to the stores and withdraw products, for instance when products had started showing black spots, resulting from slaughtering too stressed fish – hence shooting blood out to the muscles – something that do not show before a few days after – when the blood had coagulated. In his view, no variation neither on quality nor on the visual presentation of the product could slip through the control.

4.3 Changing practice through networking

Three years after the initial idea the time had finally come for a market test. The newly hired commercialization manager started immediately to work on the concept, and within a couple of months he had a concept ready. This meant intensive work on naming, categorization, and designing the product, based partly on projections of ‘ideal’ users, and partly on interaction with real users.

The change in phase 2 to pre-rigor salmon and a high-quality production strategy enabled (and required) a high-end concept, and designers and chefs were assigned to helping out with shaping it. T-design suggested a minimalistic logo and design.



Picture 2 and 3: The first Salma package

‘SALMA’ in clean, white letters on black background, with ‘Fresh cured salmon’ as subtext, and with two symbols above, guaranteeing for quality and freshness of the product. The first package designed had a bright red colour, picking up the colour of the product, and containing a 250 gram whole Salma roll. While T-Design worked on

shaping the visual *representation* of Salma, elite chefs worked on its *presentation*. For an object like Salma, its audience would easily become uncertain about what this was meant to be. Thus, pictures showing Salma on display among some of the trendy ‘hipsters’ of food was produced, for example sushi (Asian cuisine), hinting at the absolute high-end quality of the product, and seafood pizza, a healthier alternative within the popular Italy-inspired menu. Later, some of these chefs would also appear at various places where Salma needed exclusive introduction to new actors; such as food fairs and business meetings.



Picture 4 and 5: use situations for Salma Cured

Now, Salma started to assemble a set of associations making it presentable as a viable concept for conscious consumers willing to pay for trying a healthy and tasty alternative to meat and poultry. In the commercialization plan, the vision was to “set a new standard for Norwegian salmon products, based on quality, uniqueness, and freshness”, with the goal of creating “the worlds leading brand for product solutions based high quality salmon”. An international marketing tour was done planned for Salma. Existing business relations, food fairs, and new contacts were visited in US, France, Singapore, Brussels, Moscow, etc. Feedback from and interaction with different actors in these locations came to have great impact, both on the salmon salami, and on the future commercial strategy of Salmon Brands, with adaptation of the sausage, both to Asian pizza restaurants, to German retailers, and in the last instance, reworking the whole innovation for the ‘home market’, Norway.

When visting HongKong with Salma, the team met representatives for a multinational restaurant company. ResCo was seen as the “ultimate customer” for Salma at this stage, representing everything they hoped for; restaurants (easy logistics), world-wide distribution, and association with acknowledged brands⁵.

“They were interesting in testing Salma on pizza. But we are uncertain if it is suitable, and in case, it would need less drying, so we are doing tests in our own lab now, on baking, smell, taste, and price” (marketer 2).

The R&D director at ResCo, suggested that it could be tested in their Japanese restaurants as their ‘monthly special’ campaign in Japan later the same year, with TV-commercials and special offers in the restaurants. This would have meant massive attention to Salma among some of the most open minded, but also demanding, consumers in a huge market. However, this customer also had some labour intensive demands, and to be able to answer the question of feasibility for warm food properly, Salma had to be taken back into its laboratory. From being (finally) stable both in shape

⁵ ResCo is a multinational company with R&D facilities in Singapore. They have 35.000 restaurants across the globe, with a portfolio of recognized brands.

and production, its identity was now questioned again, opened up. After a process of altering some of the steps of processing, such as salt, water content, smoking, testing times of storage, and finding the best solutions for slicing and distribution, the results were positive. Unfortunately, in the meantime ResCo had lost interest. When the good news were sent to ResCo R&D in Singapore nothing happened. Silence. The customer had, for unknown reasons⁶, lost interest, and the attempt to mobilize the desired customer had brought both much work, and a failure.

After DairyCo's agent for distribution of cheese in Germany, caught interest in Salma at the food fair in Paris, plans for distribution to retail chains in Germany started emerging. Very early, it was tested at the prestigious hypermarket, KaDeWe, in Berlin. Although not becoming an immediate big-selling hit, it received positive feedback from consumers, especially when it was demonstrated in the store. Secondly, it was sold at the ferry between Oslo and Kiel, where it sold steadily to German tourists wanting to bring something Norwegian back home. The agent was, however, uncertain about the suitable categorization of the product, related to the shopping practices of consumers:

“Perhaps Salma belongs to the meat shelves? It is more similar to those products, where it is common to slice the products, and so forth” (german agent).

While emphasising its similarity with meat products, he still chose to locate the product together with smoked salmon, and other cured sea-food products. Associations to meat salami was helpful for communicating use, but the nutritional value and of course the raw materials was more similar to fish products, hence trying to maintain both sides by calling it 'lax salami'. Producing arguments for why consumers would be willing to pay for such a product, he chose to launch it as “something extra for the weekend”. A number of purchasing managers were convinced and willing to give it a try, and so Salma was ready for test sales in 90 German 'hypermarkets'. Although not catastrophic, the sales of the 'Lax Salami' did not go particularly well in the second round either.

Salma had still not found its final shape, and no closure could be achieved before making some real and voluminous sales. Strategic considerations of brand development and positioning, and decades of experience with the food industry could not settle Salma's identity. Its fate was fully in the hands of the customers (industrial actors) and their customers (consumers). Hence, it was easier to go back to the laboratory and the marketing department to develop new versions of the product, and in particular products that came closer to already existing products in the market. At this point, a couple of ideas that had been considered for a while gained strength. Under pressure for economic results, the idea of marketing the fresh salmon loins instead of curing them, and the idea of working with DairyCo's established market relations in their domestic market got full legitimacy. Opposite to the salami version, the marketing of 'Salma Fresh' launched in Norway, starting in a familiar setting, where DairyCo already had relations, recognition, and a strong market position on several other brands and products (dairy and easy-meal products). Neatly cut loins without skin and bones, packaged in transparent foil and with the same minimalist design concept.

⁶ We tried to contact ResCo about their point of view, but they refused to participate in this study.



Picture 6 and 7: Salma Fresh

The strategy was to start with the best stores, and the marketing manager took a round trip to some local fish deli's in Oslo, with negative results (no relations). They did not see any value in a fish product that looked so different and was packaged in foil. But a 'gourmet supermarket' immediately caught interest, and agreed on a test campaign. The consumer response was very good, and Salma now had an excellent position for presentation to the large retail chains. And because the supermarket was associated with a large retail chain, a long time customer of DairyCo on dairy products, access to nation-wide distribution was suddenly wide open. It was first launched in 3 hypermarkets, then 20 supermarkets, before expanding to around 100 domestic supermarkets and planning for international markets.

5 DISCUSSION

In this study we have investigated an attempt at creating new practices in between established practices, partly by appropriating resources and opportunities not exploited in other fields of practice, and partly by connecting and reconfiguring existing practices. We argue that our findings add to practice-based studies in three aspects: First, whereas boundaries between practices often are taken as rather stable, we illustrate how boundaries are (re-)made, situated and contingent. Second, we show how new practices may emerge through making sense of the 'space between practices', and how challenging it may reconfigure knowledge from different fields of practice. Third, we show how power come to the fore when changing practices, and how the 'system' of interconnected practices configuring an 'industry' enables and constrains innovation processes.

5.1 Exploring and challenging material boundaries independently

Knowledge is situated, and hence difficult to transfer across settings (Orlikowski, 2002). But still it is not indifferent *who* is trying to move and translate knowledge. Some actors are more likely to succeed than others, depending on the (sometimes unexplored) compatibilities between the specific knowledge regimes represented. In our case, we observe how the actors started exploring and developing new cross-domain practice by buying a patent application and then seeking to make sense of the invention based purely on their own practice. New resources and new technologies were brought into an existing knowledge regime, and sought developed within an existing system of interconnected practices. Evaluatory principles (Beunza and Stark, 2004), or conventions (Howard-Grenville and Carlile, 2006), from their existing sociomaterial practice of processing milk, related both to micro-biology, and to categories of users, were applied to find feasible and valuable solutions. DairyCo took for granted that they could get what they lacked of knowledge by interacting with others. However they had not foreseen that they could not utilize or connect with the other field of practice without learning more about that practice themselves first. Ironically, the act of

protecting knowledge by organizing the project in-house, had the unintended consequence of losing important knowledge embedded in the relations of academic technoscience. The technical problems after moving from FoodInstitute to DairyCo, illustrates the embodied nature of knowing in practice. On the other hand, we can not be certain that the presence of someone used to working with meat would have helped the translating of the practice to fish. Anyway, this independent strategy of innovation did not work out when working on materials from another industry. For their own knowledge to become translatable, they needed more knowledge about the practice of 'the others', and therefore they started recruiting allies on the fish side.

5.2 Establishing new practice between established practices

When it turned out that they lacked specific knowledge from the other field of practice, they firstly hired a group of scientists and product developers from aquaculture. By acquiring specific competence on processing of fish, they also increased their ability to apply (translate, combine, enforce) their own knowledge to the new resource (fish). Second, these researchers also brought with them relations to an industrial actor with novel technology and high quality resources, again increasing their ability to translate, combine and enforce their knowledge and technologies in this reconfiguring innovation process – increasingly making a new field of practice *between* established practices. In this phase the work on developing cross-domain practice was mainly about negotiating common practice locally – in the production facilities, in the laboratories, and in the marketing offices.

Transfer of knowledge has been a central concern of organizational researchers, and here we have a clear example of blackboxing of knowledge. These changes led to a partly conscious and partly unconscious deletion of central parts of the project history. The aspects of technology and of meaning were from the start intertwined – what kind of quality, what colour, and what kind of users; attempts at imagining a radical innovation's *use*, and at the same time finding out what would be possible technically. The non-linearity of innovation, between technology-push and user-involvement is certainly not without tensions and paradoxes. The new researchers' knowledge of raw materials became less important than their established relationship with a fish farm with novel knowledge and technology for processing salmon. This enabled DairyCo to go from buying and evaluating fish in a 'market', to enrol one of the best suppliers into their 'innovation network', hence providing stable supply of high quality raw materials. In the last instance, "the one putting the last brick on the house wins everything". When going from frozen to pre-rigor fresh fish, and from mixed (white/red) to salmon, these changes became the explanatory factors for the technological as well as the economic success of the project. Earlier efforts of stabilizing fatty acids, of choosing and cultivating bacteria tribes, and of microbiological control (hygiene) were deleted from the story, until micro-organisms reappeared again, opening the black box, and revealing the complexity of stabilizing socio-polito-economic practice. However, even in this phase, some actors guarding crucial functions of business practice were absent, not included, namely market and distribution actors. Without aligning such a product with those controlling access to end-users, in this case retail chains and restaurant/catering corporations, without translating their interests and needs into the project, letting them take part in making sense of the product, it is difficult to imagine how successful commercialization could come about.

Knorr-Cetina's (1999) notion of epistemic cultures implies that epistemic objects not are easily moved between epistemic cultures. Moreover, Orlikowski argues that knowledge may *not* be moved due to its situatedness (2002: 271). While agreeing with this, we want to emphasise that it is possible to recombine and translate knowledge across settings, that some actors may have better preconditions to do so than others, but that what kind of knowledge that may be moved and recombined, how, and with whom, is a highly uncertain matter, rooted in material and social relations.

5.3 Challenging and reconfiguring systems of interconnected practices

The case also illustrates how the choice of partners may have unintended consequences. While this alliance with the fish-side enabled technical combination (feasibility) and improved the quality (according to 'nutritional standards'), it certainly did not bring them closer to potential *users* of the innovation, neither industrial customers nor end-consumers. Partly because the involved partners had a production focus rather than marketing, and partly because the Norwegian fish industry is made of practices not rewarding 'knowledge based innovation', privileging 'raw material trade' and price competition instead. Hence, these actors could not contribute to the commercialization of the new practice through their existing relations and practices. By not involving actors closer to the end-users in making sense of, and developing the innovation, they failed in shaping and conceptualizing it in tune with actors controlling access to markets. Boundaries were here clearly not given han snakker ikke om dette caset... (Barrett et al 2007). At the same time, to change boundaries, to reconfigure them, was not trivial. Differences between seemingly related (food production) practices may be considerable in a number of aspects, both related to technology/knowledge regimes, and the wider context of use (industry/system of interconnected practices). The ability to manage such cross-domain work depends on a minimum of knowledge about the others. The result is that it often is surprising to the involved actors what kind of knowledge that are useful in the new setting, what can not be translated, and how things are recombined.

Power relations, and the political aspects of innovation practice (see also Mørk et al, forthcoming), often come to the fore when emerging practices challenge the established. The power aspect in this case is largely about negotiation. Both when hiring fish researchers that turn out to oppose the original ideas of the project, when establishing large scale production at the Fish Farm with the following negotiations and imposing of production routines and standards, and when they eventually started involving users, leading to re-shaping of various aspects of the innovation.

It is evident in this case how the knowledge regime (Howard-Grenville and Carlile, 2006) of an industry may foster or hinder innovation. In the fish industry, the common conventions of production economy and of marketing clearly privileges competition purely on price, and hence disempowers all attempts at 'adding value' via research and product development. Therefore, the Fish Farm's new knowledge and technology could not be translated to economic value within their established system of interconnected practices, on the contrary the large actors in the industry (also handling international distribution) have economic incentives in *not* implementing this type of technology, at least in the short term. This is shaped more from economic conventions (of market expectations and distribution practices), than from the political or scientific. Thus, the Fish Farm had to find ways to oppose the existing knowledge regime, a process of 'mindful deviation' (Garud and Karnøe, 2001), that eventually might pay off in the long

run if the right configurations were achieved. Their partnership with DairyCo was clearly such an attempt at escaping (and thus changing) the economic and knowledge regime of the Norwegian fish industry.

Even though working *as if* the new product version, Salma Fresh, would be realized, the reason why it had not reached a final decision yet, had to do with involved actors that needed to be convinced of the idea, and to negotiate the allocation of resources and terms of collaboration. This turned out to be an example of advanced multi-stakeholder interaction. It is a balancing act of keeping multiple stakeholders interested and committed to the project, also during this relatively radical change of direction, first and foremost in the conceptualization of the product, which again led to plans of expanding the collaboration between DairyCo and the Fish Farm into including a part or all of the processing activities in a joint venture. No closure (Bijker and Law, 1987) was achieved during several rounds of developing and marketing. Temporary closure was made by stabilizing the product and sending it out for a market test. When it was not adopted, it was opened again, changed, and then repackaged for another market test, in several rounds before eventually achieving a more stable situation, closure of the product, and hence its practice.

Our study differs from Ormrod et al (2007), Ferlie (2005), and Barrett et al (2007) in that our study is both intra- and interorganizational, and from Orlikowski (2002) in that in this project some things actually could be moved, although not without problems and unintended consequences. While Gherardi and Nicolini (2002) studied knowing in interconnected practices, they did not study how these came about in the first place. And where Howard-Grenville and Carlile (2006) introduced the notion of knowledge regime, emphasising the relation between practice, materiality, and collective conventions, we have perhaps expanded their perspective in our study of cross-industrial development of new practice, strongly foregrounding the situatedness from materials and conventions.

6 CONCLUDING REMARKS

We have not just once again challenged the idea of boundaries and practices, explaining them as situated and in continuous process, but also contribute to the understanding about a particular issue: How attempts at coupling existing practices implicate a highly uncertain process of exploring and testing what and how the existing (situated) knowing-in-practice can be used in the new situation. New practices are shaped and stabilized by challenging and reconfiguring the technical, social, and political aspects of existing practice. Even if such projects may start out as intentional/strategic and as challenging the sense(s) of existing practices, the resulting process evolve in many different ways and take different directions. In the last instance any innovation project will be in the hands of the users, and if it is not convincing users, innovators have go back and redesign and repackage the innovation (whether procedure, product, service, or other), before bringing it back to the users for a new evaluation (Mørk et al, 2006). What knowledge that ended up in use was radically different from the original intentions and ideas. Whereas the whole basic technology of fermentation (making salami of the fish) was sidetracked, practices of hygiene, of salmon processing, and of branding became central elements in what in the end was commercialized. Not salmon salami, but, ironically, fresh high-end salmon loins making perfect sense for gourmet chefs and demanding consumers.

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