

Critical Episodes in a Long Term Relationship of a Food Manufacturer and its Packaging Technology Partner in the Early Stages of a New Product Development Project

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ABSTRACT

This paper deals with collaborative user involvement in the early stages of the new product development (NPD) process. The purpose of this paper is to describe the critical interaction episodes that occurred in a long-term relationship between a food manufacturer and its packaging technology partner in the development of a plastic film during the early stages of the NPD process. Utilizing an interpretative case study approach, the empirical evidence is based upon interviews, reflective practices, observation and documents. The paper will detail eight interaction episodes written in narrative and should provide valuable insight into the dynamics that occurs in close collaborative relationships. The findings showed that the cooperative interaction between the two companies went through alternating cycles of divergence and convergence to maintain and re-negotiate an already established belief structure of expected and accepted behaviour.

INTRODUCTION

Within the NPD literature, there has been an emerging consensus that while certain success factors pertain to the development and commercialisation stages, the majority are determined much earlier in the project's life, explicitly in the early or pre-development stages (Stevens et al. 1999; Cooper and Kleinschmidt, 1996; Cooper, 1993; Booz et al. 1982). Developing a product that delivers superior benefits presupposes an understanding of customer needs and wants, a process that should ideally be undertaken prior to the commencement of any actual development (Stevens et al. 1999; Cooper, 1988). Without this up-front customer knowledge, significant problems in later stages of the development process can be expected including development activities taking longer than expected, increased costs, delayed time to market and even product failure (Cooper and Kleinschmidt, 2000; NICB, 1964). However, customer need information can be costly, complex and often sticky (Von Hippel and Katz, 2002; von Hippel, 2001). Moreover, in business markets, conventional research tools are often of limited utility and since these markets have relatively small number of users, leading edge companies such as 3M, HILTI and Johnson & Johnson are increasingly involving their users in the early stages of new product development (Lilien et al. 2001). This is done to enhance a firm's competitive advantage through the provision of innovative and appealing new product concepts (Stevens et al. 1999; Cooper and Kleinschmidt, 1996; Madique and Zirger, 1984; Cooper, 1979a; b; NICB, 1964). Others (Von Hippel and Katz, 2002; Tidd et al. 2001; Cooper and Kleinschmidt, 2000; Voss, 1985) suggest that user involvement in front-end activities can also reduce need and market uncertainty by supplying manufacturers with a more accurate assessment of user requirements and consequently reduce the potential risks of missfitting buyer needs to a deficient or poor product idea (Johnsen and Ford, 2000).

However, despite the importance the literature assigns to user involvement in these predevelopment activities, there is also ample evidence to suggest that many firms do not bring their industrial users in to the NPD process (O' Toole and Lynch, 2004; Adams et al. 1998; Cooper, 1996) and in most instances, projects enter the development phase lacking any clear definition, often as a result of superficial user involvement in these early stages (Lynch and O' Toole, 2006; Cooper, 1999; Biemans, 1992; Mahajan and Wind, 1992; Cooper and Kleinschmidt, 1986). Moreover, other evidence suggests that while most firms consider user

involvement in predevelopment activities to be beneficial, they nevertheless felt that it complicated the development process and made it more difficult to control and manage (Lynch and O' Toole, 2004). For the authors, this apparent contradiction in the literature is an indicator that perhaps a fundamental gap exists between the scientific literature and practice or at the very least, the practice of actually involving users in the early stages of the development process continues to pose a significant challenge. For Biemans (1992) the responsibility for this distinct research gap between literature and practice is a result of the paucity of research investigating the user involvement phenomenon. He argues that the few specialist studies that do exist tend to approach the concept from a mechanistic perspective – the focal firm organises user involvement in a hierarchical rather than a collaborative way. Subsequently, there is little practice description of the '*how to do variety*', as much comment tends to focus on the pitfalls and factors conducive to success. It is this knowledge deficit that has resulted in academics being unable to provide practitioners with the solutions needed to implement the user involvement concept effectively and so the effort of actually cooperating with users in practice will be even more difficult to achieve (O' Toole and Lynch, 2004). User involvement implies a cooperative approach to new product development. The process must be described, as must the messy dynamics inherent in a complex multi-actor situation. Understanding the processes that enable manufactures to successfully interact and involve users in their pre-development process is a key part of our research agenda. In this fashion, the purpose of this paper is to describe the critical interaction episodes that occurred between a manufacturer and user during the early stages of the NPD process and in so doing, provide valuable insight into the dynamics that occur in close collaborative relationships.

The rest of the paper is organised as follows. In the next section, the methodology employed in this research is discussed and subsequently, the results of that analysis are presented. In the concluding section, implications are explored. Limitations and future directions for research are also discussed.

Research Design

The need for interpretative research to study user involvement in the early stages of new product development has often been postulated (Lynch and O' Toole, 2003).

Sample and Method

This paper reports on an in-depth case study of a long-term relationship between a food manufacturer and its packaging technology partner in the development of a plastic film during the early stages of the NPD project. Data was gathered in real time, over a six-month period, between October 2005 and April 2006. Since this research was occurring in real time, care had to be taken not to influence the ongoing interaction process between the two companies. Indeed, as observed by Doz (1996), with "real-time process studies...it is extremely difficult to be sure not to influence ongoing processes and still maintain a legitimate presence in the field insofar as managers would quickly be tempted to seek advice from the researcher and ask the researcher to intervene in the process, as a *quid pro quo* for allowing access" (58). To ensure the prevention of researcher bias on the case, from the outset, a boundary was firmly established and reasons explicitly stated to informants. In fairness to the case companies, that boundary was not breached

Data was collected from four main sources: interviews, reflective practices, documents and observation. The variety of data collection techniques allowed for greater possibility of discrepancies or anomalies to be noted in research data, and should compensate for any limitations in individual collection techniques (Eisenhardt, 1989). Multiple sources also

counteract potential validity concerns in relation to theory development, because multiple lines of enquiry converge towards a particular proposition or conclusion (Yin, 2003).

All in all, 29 interviews were conducted with the key members involved in the development project. Of these 19 were personal in-depth interviews and 10 were telephone interviews. The personal interviews ranged in length from 1 hour to 3 hours each. The telephone interviews lasted about 10 to 30 minutes, with the shortest of these aimed at corroborating existing information obtained via interviews, documents etc or at alleviating confusion over some point. The telephone interviews were mainly made after personal interviews had been carried out. An interview guide was made before each interview. Nevertheless, the interviews took an unstructured format. The individuals that were being interviewed were highly educated, competent executives and understood the cooperation process between their company and their partner. Thus, they talked freely, only to be interrupted by the researcher on some follow-up issue. The role the interviewer played was only that of a guide through the interviewees' story. For instance when it was felt that a topic was exhausted, the researcher would introduce a new topic, based on the interview guide, or some issue that may have materialised in the interview. Thus, the interviews had a very relaxed feel to them, even conversational, and rich insightful data about the interaction processes involved in their cooperation, emerged.

The reflective practice involved the researcher analysing data gathered from in-depth interviews and documents, and putting it in to a story, and then, presenting that story to the respondents. Gaps of understanding, about, what was going on, were evident in the narrative, and were subsequently filled in by the respondent. In one way, the participants became in part, the analyst of the data and in the act of writing the narrative and listening to the respondent, the researcher was able to immerse himself in their experiences and get at *what is going on* (Denzin, 2001). The routine that emerged in conducting reflective interviews, was that at the start of a scheduled in-depth interview, the researcher would present the narrative about the data collected to that point and discussion would ensue, errors would be highlighted and understanding would emerge on issues. When the discussion was exhausted, the interview would then revert back to gathering and uncovering the next episode of the story. At the next meeting, the same process would occur as just outlined, the researcher would show the updated narrative, including new data, and the respondent would be asked to fill in the blanks. Once understanding was arrived at, the next episode would be investigated.

Documentary data, printed as well as electronic, were collected from various sources such as annual reports, academic databases, commissioned company reports and product design specifications. In total 45 documents were used. In most instances, documents were studied in preparation for interviews. Finally, data in terms of government reports were assessed to understand the specific nature of the industry context during the period of the study.

Observations influenced and contributed to casework, to the extent that *a picture paints a thousand words*. It facilitated the researcher in observing the products and production process "in use", and so, provided a greater contextual understanding of the product concepts and development issues under research. For instance, the researcher was brought on to the factory floor and was able to see how the packaging was made, what a packaging sealing issue was and what slippage means. The observation allowed the researcher to gain insight in to knowledge that was hard to communicate without actually experiencing it, and in this fashion, fertilised the researcher's understanding of concepts that the participants were talking about

Data Analysis

In order to categorise and identify the processes that occur in the interactions between the manufacturer and user in the early stages of new product development, this research builds upon the analytical ideas of Pettigrew (1997), Fox-Wolfgramm (1997), Hirschman (1986), Lincoln and Cuba (1985), and Glasser and Strauss (1967), and uses comparative analysis. This analytical strategy incorporates a constantly iterating cycle of deduction and inductive category coding and pattern recognition across categorised phenomenon (Pettigrew, 1997). In this analytical model, social phenomena were continuously being compared across categories so that new dimensions could be discovered. The discovery of the dynamic processes of interaction began with the analysis of initial observations. However, these initial observations underwent continuous refinement throughout the data collection and analysis process, because data collection, analysis and interpretation are occurring simultaneously, and so continuously fed back into the process of category coding. Category codes and their content were continuously compared with previous events and so new insights were discovered (Lincoln and Cuba, 1985). From the outset, it is worth noting that the dynamic comparative method utilised in this study, is a systematic analytical procedure that integrates both data and theory to arrive at a sound interpretation of the data. Data collection and analysis techniques were relied upon, and concerns over reliability and validity were addressed with this analytical research approach to interpretative data (Fox-Wolfgramm, 1997).

Nvivo, qualitative analysis software, was utilised to manage the process of coding, retrieving, memoing and data linking. In the domain of coding, text chunks of transcribed data were unitised and categorised by giving them a code. The code that was assigned resulted from keywords or labels that were used by the research subjects to describe the phenomenon under discussion. When unitising, each unit was coded according to the source, site, date, label etc. This coding process allowed the researcher to retrieve information when needed, thus facilitating the refining and regrouping of knowledge units through the linking of ideas and sources, identifying contradictions in arguments and comparing dissimilarities (di Gregorio, 2000).

Research Site and Context

Starting in 1985 and continuing today, Packfex and Farmfresh collaborated closely in developing packaging film for Farmfresh's food products. The relationship began in 1985, when both companies co-developed an innovative and revolutionary film (Chub X1) that actually became the cooking vessel, in that the raw meat entered the packaging and is cooked. Indeed, the innovativeness of the packaging is still evident today as only a few companies have been able to produce a similar film. Presently Chub X1 is Packfex's biggest selling product and as Packfex is currently becoming more global, new applications for the plastic are emerging such as plastic covering for army artillery and sales of the film in 2006-2007 are expected to increase exponentially. Over the past twenty-one years, the relationship between Packfex and Farmfresh has become close and can be characterised as being highly integrative, with high levels of trust, commitment, and cooperation. Communication between the two companies is high with a considerable amount of information sharing. In addition, there are a number of close professional and inter-personal relationships between individuals in both companies.

However, in late October 2005, in two of Farmfresh's production facilities, Chubb X1 was uncharacteristically causing significant wastage, approximately 33 per cent. To put this in to perspective, in production terms, the golden rule is that production efficiency running in to double figures is totally unacceptable. The problem was communicated when one of the Farmfresh plant directors contacted Packfex to request that someone come down to their plant and rectify the situation, as it was costing significant amount of money. Assurances

were given that the problem would be dealt with. However this did not materialise and Farmfresh got extremely upset at the lack of response from Packfex in solving the wastage issue. Tension between the two companies was evident when the Engineering Manager (EM) contacted Packfex and very aggressively demanded that they come down to the plant at 6am the following morning to witness the wastage first hand for themselves and a meeting with Farmfresh's management board was to be scheduled after the production run to discuss how this quality issue was going to be solved.

I wasn't happy overall...there were a lot of questions being asked [about Packfex] like what's happening now. There could have been a quicker reaction time (Farmfresh: EM).

You have got to show quite a lot of commitment at that particular point to handle the situation. When Farmfresh rang up and said that we are going to run at 6 o' clock tomorrow morning and as unreasonable as it sounds and in relation to what other appointment or meeting you have got, I had to jump in and bite the bullet, because they would not be interested in talking to us if we didn't turn up. If we didn't turn up, Farmfresh would have thought that there was no commitment from us to solve the issue we were having (Packfex: TD).

When Packfex's Technical Director and Account Manager went to the site the next morning at the agreed time, the first thing that both of them noticed was that none of Farmfresh's management team were present. In fact, they did not arrive till 9am, three hours later. For Packfex, that was quite an amazing statement. They felt that Farmfresh were trying to show them that they were the dominant actor in this relationship. However, the Packfex representatives did not mind being left on the factory floor with Farmfresh's operatives because it allowed them to observe the production process in real time. It also allowed them to interact with the operatives and to get first hand illustrations and explanations of the problems that were occurring in the production process.

When Farmfresh's management came in at 9am a conflict immediately ensued between EM and TD, in that the former was blaming the film for the high wastage and the latter was blaming a catalogue of mechanical errors with the packaging machine.

We stated to them that the machine had a catalogue of mechanical problems. At this particular point EM is angry because here am I going through the issues, the problems with his machine. He had worked on this machine for the last 7 years trying to get wastage down and here am I jumping all over his toes. And the conflict at this particular point is intense. The anger and the facial expressions in his face as I was going through this is really visible... The tension at that moment was very high. We were standing on his territory, discussing his machines in such a manner that he is going to find it extremely aggressive. The only way to describe that interaction is that the guy took a pasting from me (Packfex: TD).

At the formal meeting between the two companies Packfex reiterated the technical faults that they had discovered with the machine and stated that no alterations to the film would be made without these mechanical issues been fixed. Within Farmfresh, the production and engineering departments were not happy with Packfex's assessment of their machines because it meant that production would have to be stopped and there was now an internal conflict from other departments demanding to know why these technical issues were not resolved before. However, EM was claiming that it had to be Packfex's film since other packing ran on the machine with no faults. However, despite Farmfresh's arguments that the film was to blame for the high wastage, Packfex were adamant that the mechanical issues had to be dealt with before any product alterations were contemplated. The meeting ended with an agreement that the technical faults would be rectified.

When we went in to the meeting, we stated that before any changes are to be made to the product, they had to fix the machine and we gave them 5 faults that needed to be corrected before we would get involved. EM did not agree with us and had stated that the machine manufacturer had been here last week and that the machine was in pristine condition. They were telling us that our film had faults and that when they put on our roll they got 33% wastage, however, whenever they put on other rolls they were getting none. First of all alarm bells were ringing. We knew we were not been told the truth. We knew the wastage was high on the other rolls as well. So we told them that there were 5 faults with the machine and that they needed to be corrected before we would even contemplate adjustments to the product. In fairness, to EM, he agreed and the production line was shut down until the faults were corrected (Packfex: TD).

To resolve some of the tension between the companies TD and EM worked out a methodology to fix the technical faults in the fastest time possible so as not to delay production.

TD stayed with us when we were trying to figure out how to solve the problem and gave us ideas on how to fix the machine. I found him very good... We actually had to do a full diagnostic on the machine and it meant that we had to spend a lot of money changing parts and there was the time, the labour and production had to be stopped (Farmfresh: EM).

Also at this time, Farmfresh's corporate buyer with whom Packfex had a very close relationship with for a number of years retired and the new corporate buyer began rationalising his supplier base. For the new buyer Packfex were a small packaging supplier with a small spend (number 10) and informed them that due to the significant quality issues that they were on-going with their film, that they were been de-listed. Packfex did not argue with the new buyer and told him that they understood his rationale and that their services were always available to him if he so needed.

He was showing his metal, it is all about pecking order and we knew that if he was going to upset the apple cart with us, he was probably going to do it with all the rest of the suppliers. What he was doing was very controversial and most companies would adopt a stance that I will teach him and so a conflict would ensue. We didn't see it like that at all. We saw it as an opportunity to move up the supplier list, even though we were technically de-listed. We knew that our product was very unique to Farmfresh and that they would have a hard job replacing us...we had to be patient. He couldn't de-list us, but he had not realised that yet (Packfex: TD).

The buyer found that because Chubb X1 is such a unique and complicated product that he was unable to locate an alternative supplier to Packfex. Indeed, he found that he was dependent on Packfex. Moreover, the buyer found significant resistance from other departments such as marketing within Farmfresh to the de-listing decision. Thus, while Packfex was technically de-listed they were still supplying Farmfresh with the Chubb X1. This also meant that the quality issues at Farmfresh had to be resolved. As a result of the corrections to the machine the wastage level on Packfex's film dropped from 33% to 15%. Packfex was also informed that wastage on competitor's films had also significantly been reduced and was now running at approximately 9%. Despite the ongoing wastage issue Farmfresh were ecstatic. They had a significant drop in wastage, not only on Packfex's film, but also on other suppliers. At this point, Packfex knew there was a problem with the film. The waste figure was very high at 15% and the fault was not with Farmfresh's machine.

In the beginning there was a machine issue and a film issue. When the machine issue got sorted, the film was still causing unacceptable levels of wastage. So for a while, there was a grey area there when there was not a definitive problem with the film...however when the machine was fixed we knew there was something wrong with the film (Farmfresh: EM).

Packfex travelled to Farmfresh's factory floor to witness the wastage. What they found was that the packaging film, filled, it sealed, it clipped, it cooked and it was during the chilling stage, which is at the very end of the process, the fault appeared. The film actually split. Since the film was in Farmfresh's cooking process for four days when the packaging split, it meant that besides the high wastage and the extra production time needed to compensate, it also meant serious time delays in Farmfresh's delivery of its product to customers.

So the second time we went back. EM has now fixed the machine and got less than 9% wastage with other films on the machine and we were still getting 15-20%. EM put the roll on and we saw it run. It was quite clear now, black and white that it was now a film issue. Now the situation changed the other way around and now EM was saying that there is something definitely wrong with the film and that he had accepted everything I said about his machine and so what was going to be done about the film. Now this wasn't a conflictual meeting at all, because the EM is now a hero in Farmfresh, because following the conversation with me over the issues with the machine, after 10 years of waste, he had got the waste level down on his machines to between 8-10%. If you are turning several million euros, you are talking about serious cost savings for the company. EM got an awful lot of respect from his colleagues (Packfex: TD).

Although a professional and personal relationship had existed prior to the problems with the film, the consequential effect of both individuals working together to fix the machine was that the personal bond between the EM and TD had deepened. Since both had similar engineering backgrounds, interacting with each other was relatively fluid and a relational trust had formed between the two. Both TD and EM agreed that the film had to be altered and a co-development meeting was scheduled. Also at this time the buyer having realised that it would be difficult to de-list Packfex, offered them a substantial increase in orders and Packfex moved up the supply chain to the number five supplier.

Critical Interaction Episodes

The following project narrative traces the dynamic interaction processes inherent in the product development collaboration between Packfex and Farmfresh on the development of a new packaging film. As is clearly evident from the above description, an established close relationship already exists prior to project initiation. Table 1 presents a chronological map of the interaction episodes between the interactants, detailing both actions and perceptions.

Episode 1. Convergence: Shared Expectations

Both companies entered the first development meeting with the expectation that the adjustment to Chubb X1 would be rectified within a relatively short period of time, approximately one week. The urgency to rectify the problem stemmed from two main rationales. First, Packfex faced a potential consequential loss claim for the wastage which can amount to ten times the cost of manufacturing the film and second, Farmfresh were in a situation where they had to use the faulty film until the problem could be rectified and the film up-lifted and replaced. For Farmfresh, this meant a period of high wastage, delayed production, and unsatisfied customers and they were willing to accept that while the problem was been corrected.

Part of the problem was the film had to be fixed, but we still had to produce. It meant that we had to work more to reach our quotas. We really had to have great patience. The wastage was still going on while the film was been fixed...but the ultimate goal at the end of the day is that the problem is fixed (Farmfresh: EM).

Table 1. Interaction Episodes

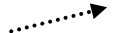






Legend	 = Divergence	 = Convergence	 = Evaluation
Packfex	Episode 1. Convergence: Expectations of Cooperative Development Assumption of a relatively easy task Short time frame expected Potential consequential loss claim for the wastage See Farmfresh as partner, close ties Level of engagement high Intensive interaction Bilateral communication of ideas	Episode 2. Divergence: Problem Ambiguity and Expectations Suffer Expectations suffer Realises that interaction is going to be more difficult than previously expected Concern over consequential loss Reassurances given that problem will be resolved	Episode 3. Convergence: Problem Identified Expectation high that the problem is resolved Engage in intensive interaction and communication Joint decision making is undertaken
Likelihood of conflict	↑ Threshold of evaluation		
	Nov 2005	Dec 2005	Jan 2006
Farmfresh	Assumption of a relatively easy task Short time frame expected Nervous over high wastage – patience See Packfex as partner, close relationship Level of engagement is high Meaningful communication Perceived up-lift as an illustration of commitment	Expectations suffer Perceive Packfex has letting them down Frustrated at lack of progress	Expectation high that the problem will be resolved Engage in intensive interaction and communication Joint decision making on all activities Kept up-to-date of all development

Table 1. Interaction Episodes (Cont.)

Legend	
	= Divergence
	= Convergence
	= Evaluation

Packfex	<p>Episode 4. Divergence: Expectations Suffer Over Problem Realises the difficulty involved Emphasises with Farmfresh's situation Concern over lack of progress Concern over the threat of consequential loss Time pressure is critical</p>	<p>Episode 5. Convergence: Solution found Interaction is extensive, brainstorming sessions Intensive communication Past history facilitates efficiency No relational ambiguity Sense of relief over threat of consequential loss being removed Sense of closeness with Farmfresh</p>
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Likelihood of conflict

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Threshold of evaluation

Farmfresh	<p>Frustrated at the lack of progress Becomes worried at the degree of difficulty Concern at the mounting cost Questioned whether Packfex appreciated the cost endured Felt that Packfex's reaction times could be quicker Is appreciative of Packfex's dilemma Discontentment communicated</p>	<p>Engaged in brainstorming sessions Intensive interaction and communication Sense of relief and euphoria Expect cost and wastage to decrease Sense of relational closeness with Packfex</p>
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Table 1. Interaction Episodes (Cont.)

Legend		= Divergence		= Convergence		= Evaluation	
Packfex	<p>Episode 6. Divergence: Expectations Suffer. Tensions reach a new high</p> <p>Expectations suffer Concerned over tensions Communication is perceived as aggressive Concerned about the future of the relationship Realised confidence must be restored in EM and PM. Reliance on inter-personal and professional relationship. Concerns over inter-personal relationships</p>	<p>Episode 7. Convergence: Solution Found</p> <p>Conflict must be resolved. Reliance on inter-personal relationship with EM Communication perceived as intense. Perceive high commitment from Farmfresh to resolve concept problem Concerns over inter-personal relationship resolved. Expected continuity of the inter-organisational relationship and individual</p>					
Farmfresh	<p>Expectations suffer Perceived that Packfex and TD let them down PM felt that Packfex should be desisted Psychological contract for cooperation decreases Production and engineering stop communication with Packfex Internal conflict emerges over de-listing</p>	<p>Shared commitment Quality of communication increases. Limited conflict at both inter-organisational and inter-personal. Resolution of conflict is seen as part of doing business. Compatibility exists Expected continuity of the inter-organisational relationship and individual</p>					

The meeting evolved into a brainstorming session in which both actors, discussed in detail the problem and potential solutions. As both parties were familiar with each other, the level of engagement from both sides to solving the issue was said to be very high and intense. Both parties openly communicate and shared ideas. As a show of commitment, Packfex agreed to take corrective action and sent a team to Farmfresh to go through their stock of Chubb X1 film and any product that was deemed not fit for process was removed.

Episode 2. Divergence: Problem Ambiguity and Expectations Suffer

Expectations suffered. The initial goal of a quick product improvement was diminished as the problem with the film was not easily identifiable.

We thought perhaps a week... What we did was that we broke down the film and did a technical analysis on it. The problem is that there are about 5 million parts to a film and locating what is specifically wrong is very difficult...but when we did the analysis on the film we knew that this was not a simple problem and we had to confirm to Farmfresh that to get a resolution would take a minimum of 4 weeks (Packfex: TD).

The tension between the two companies was very high. Farmfresh had an expectation that fault with the film would be resolved in a quick period of time and from their perspective Packfex had let them down. Farmfresh were extremely frustrated as it meant that the high wastage and the costs associated with it would continue in to the near future.

Farmfresh were saying to us that had they known that the problem could not be solved quickly; that they would have went to another supplier. If the persons expectations are not met, conflict will occur and we had to try and reduce the conflict by reassuring them that their expectations will be met to a certain degree but that they might not be what they initially thought - at that point we had to change their perception of what was feasible (Packfex: TD).

To alleviate some of the conflict Packfex did make some adjustments to the film that would reduce the wastage slightly, however the film could not be up-lifted as there was nothing to replace it with. This meant that Farmfresh had to keep using the existing film while the solution was being developed. Nevertheless, pressure was been exerted on Packfex from all departments in Farmfresh to fix the problem. At this stage, the tension and the conflict between both companies was extremely dense.

There appeared to be no progress, we were still getting the same film, the same wastage. There just wasn't any progress. Whatever way you look at it. I don't think Packfex came across this problem before and so there was a good bit of confusion. The process for figuring out what was wrong with the film was a bit all over the place. I don't think that they were following any real guidelines in identifying the problem (Farmfresh: EM).

Moreover, from Packfex's perspective the threat of consequential loss was ever present.

Episode 3. Convergence: Problem Identified

Despite the tension between the two companies, both needed the problem with the film to be rectified. The conflictual tension was reduced through continuous engagement and a joint analysis of the problem was undertaken. The dialogue between the two companies and the level of intertwining among various departments was very regular and frequent, to the point where they were jointly making decisions

in relation to the course of action been taken. The analysis uncovered that a supplier was guaranteeing that their raw material would meet particular sealing requirements, but analysis showed this not to be the case.

It worked out that one of our suppliers changed an ingredient in the formula without actually informing us. Once we got into it we identified the problem within 24 hours (Packfex: TD).

Having identified the problem, the supplier was contacted and insurance was given that requirements would be met. Both Packfex and Farmfresh felt that within a relatively short period of time, the film would be rectified and the production issues at Farmfresh eliminated.

Episode 4. Divergence: Expectations suffer Over Problem

However, it was soon realised that the problem was far greater than was anticipated. First, the supplier refused to admit that it made any alterations to the sealing layer and refused to engage in any discussion on the matter, mainly due to the possibility of consequential loss. This dramatically delayed the progress as it meant that Packfex had to analyse their supplier's product to identify which ingredient was altered.

If they had to turn around to us and say the fault was actually theirs we could have been able to work with them and Farmfresh to ensure that the film worked. But instead they opted not to inform us of any change. Which ended in the fact that we had to make a new product, when probably slight adjustments would have only been needed...and we had to de-list them (Packfex: TD).

Having identified the ingredient, it was then discovered, that new regulations prohibited the ingredient from being utilised in a sealing layer and hence, the reason why the supplier had removed the ingredient from its product in the first place. However, this finding caused a significant problem, in terms that an alternative supplier and alternative ingredient to the formula had to be located. What is more, tensions began to mount significantly between the two companies due to the ever-increasing catalogue of setbacks that were been experienced on the project. Farmfresh were getting frustrated at what appeared to be a lack of progress. They felt that the film should have been rectified by now and that perhaps Packfex, did not fully appreciate the cost to Farmfresh, which was clearly expressed to them through several communication mediums at that point. While consequential loss was not explicitly threatened, it was never the less implicitly implied. Farmfresh were increasingly becoming worried that the problem could not be solved.

At this particular point, we had to solve the problem; we had to solve it today. There just wasn't any question of that at all, we had to solve it. Time was now the constraint. Farmfresh could not stop producing and so our back was up against the wall. The clock is ticking and the sense of urgency becomes absolutely critical from the point of view that the tensions between the two companies is intensifying and about to boil in to a full conflict (Packfex: TD).

Nevertheless, it has to be stressed that Farmfresh understood and empathised with the difficulties Packfex were experiencing, nevertheless, they still needed the problem to be solved as fast as possible. For Packfex, the threat of consequential loss was real.

There could have been quicker reaction time on some issues. This was a big headache for us, especially production...but how do you put a time limit on something that has never happened before. It was new to both of us (Farmfresh: EM).

Episode 5. Convergence: Solution Found

A concept solution was developed through a series of formal and informal brainstorming sessions. At the formal sessions, all suggestions were documented, discussed, and eliminated if not appropriate. Informal sessions occurred over the phone or on Farmfresh's factory floor. Three main individuals involved in this process were TD, EM and PM and the level of interaction between these people was extensive and intensive.

To get to the point of developing a concept solution, there was a lot of brainstorming between Farmfresh and ourselves. I had so many conversations one to one and over the telephone. Most of the time it was between myself and the production manager or the engineering manager...In relation to Farmfresh, brainstorming didn't necessarily have to take place around a table...often we were on the factory floor hammering out ideas...that is brainstorming and sometimes the most valuable ideas come from that informality. These brainstorming sessions are invaluable because you are filtering out what concepts or ideas you are going to use (Packfex: TD).

Because there was an existing working relationship and personal relationships between these individuals, they understood how the other operated and so the communication of ideas, what they felt did not work, or did, was clearly expressed, and taken on board as a valid input. In essence, because of their relational history, there were no relational ambiguities surrounding the issue of trying to solve the problem. All ideas in relation to changing the sealing formula were clearly communicated and decisions were jointly made. Indeed, it was stated by both companies that their interactions were characterised by a sense of honesty and openness.

Our relationship with Packfex is good. Interacting with TD is good. There is honesty there. We know them and we work well together (Farmfresh: EM).

As a result, an innovative solution to the problem was devised and tested for requirements. It was felt by both parties that the problem had been solved. Indeed, there was a sense of euphoria amongst the people involved and the relationship, between the two companies was said to get even tighter. Moreover, there was a sense of relief for both Packfex and Farmfresh. The threat of consequential loss was removed for Packfex and for Farmfresh, the high cost and wastage would be reduced.

What we did in Farmfresh was very controversial. We changed the sealing layer completely away from traditional practice to what it is now - yy. What happened was that we created a brand new product. So what we did was that we took that old product apart and rebuilt it as if it were the ideal utopian product for Farmfresh. Rather than using xx as a sealing layer we used yy. The idea for using yy instead of xx came as a result of new product that we were developing with a European manufacturer and in the course of testing suitable ingredients we discovered that one of the properties of yy was that it was a good sealing layer (Packfex: TD).

From the outset, it would appear that since the concept was developed, the remit of the research investigating user involvement in the early stages is then satisfied, and so, the project narrative is, thus, concluded. However, in this particular instance, this is not the case. The film solution, Chubb X2, devised by both companies was

developed, however, when the film ran in Farmfresh's cooking process the wastage was higher than ever before, approximately 50%. Although Chubb X2 had resolved the sealing issue, another problem materialised as a result of the changes to the sealing formula. In essence, the new film was thicker and not as smooth as the original and as a consequence, the film moved slower through the packaging machine causing it to be misplaced.

What happened was that when we sorted out the sealing issue, because we changed the formula, we found a completely different problem materialised. What happened was we sorted out the sealing issue but now there was a problem with the slip ... they [the film] were out of place –the product was misplaced- it was not where it should have been. We did alter the feel of their product (Packfex: TD).

Thus the narrative continues of the pre-development process of ChubbX3

Episode 6. Divergence: Expectations suffered. Tensions reach a new high

When Chubb X2 failed, the tension between the two companies and the key individuals TD, EM and PM, escalated to an extreme intensity. The communication between the two companies was said to be very aggressive and threatening. As far as EM and PM were concerned, Packfex and TD had let them down, and worse, had made them look bad within Farmfresh. Indeed, both EM and PM were under fierce internal pressure for the failure of Chubb X2. The animosity between the key individuals was clearly evident when EM and PM would not even communicate to TD in relation to rectifying the new problem and as far as they was concerned Packfex should be de-listed.

It was like we had made no progress at all. There was a lot of patients on our part when the problem with the film was been sorted...because of the fault we had a lot of waste...there just wasn't any progress and that is the way we looked at it. It really wasn't what we expected (Farmfresh: EM).

However, internal conflict broke out between other departments in Farmfresh, when engineering and production tried to de-list Packfex. As was mentioned earlier, Packfex had multiple working and personal relationships in different areas of Farmfresh and now they relied upon those multiple relationships to stem the conflict from engineering. It has to be stressed that although communication broke down between production and Packfex, communication was still ongoing between Packfex and other departments within Farmfresh. However, TD knew that if he did not get EM and PM involved, the project would fail. They were key individuals.

Sometimes you have a situation where one person in their company is your provocateur, his one with the issue. So you have to surround him with people within Farmfresh that like your product and your company (Packfex: TD).

In relation to resolving the conflict, TD eventually contacted EM, whom he had a very close bond with. EM reluctantly took the call, and stated that while he would like to keep working with TD, he was under pressure from other factions in Farmfresh, not to have dealings with Packfex anymore.

EM was telling me that there was no reason for me to be phoning him, we had our chance, we would be desisted and that I was wasting his time. I told him that innovation is an iterative process and that this was an engineering situation. I was trying to relate the whole situation back to his experiences so I asked him how many times had he been

convinced that welding a bracket to a machine would fix a fault, you weld the bracket and the machine is still faulty and all the time it was only a loose screw and you didn't see it. I asked him how many times had that occurred and if it hadn't I will put down the phone but if it had, then he would understand where I was coming from (Packfex: TD).

I understood where he was coming from. I understood that it is an iterative process, that it is a step- by-step process. I understood that (Farmfresh: EM).

Having convinced EM, to provide assistance, a meeting was scheduled between the two companies. The meeting was extremely confrontational; yet, the level of communication was also high. Farmfresh were annoyed with the lack of progress and placed the majority of the blame on Packfex. Since both parties knew each other very well, frustrations and accusations were openly communicated and dealt with. In essence both companies managed to argue their way to an understanding that the project should continue.

In relation to the failure of Chubb X2, it was really hard because we had to go back to Farmfresh and pick them up of the floor and there was also a loss of faith in us. At this particular point we are trying to positively reinforce the relationship, no negativity at all (Packfex: TD).

We had to be positive the whole time in that meeting. It was not a matter of saying how are we going to come up with a solution; it is a matter of when we fix this. We were constantly reminding them of the benefits that they were going to get...All the time we are trying to give them positive reassurance that we are going to get to the goal, its just taking a little bit longer than anticipated and yet this is perfectly normal because innovation is an iterative process. Is it painful? Yes. Is it going to get an easier? No. It is probably going to get harder (Packfex: TD).

The meeting ended with both sides in agreement that the development team reconvening to solve the issue. Although at an inter-organisational level the conflict had been resolved, at an individual level there was still considerable animosity between TD and EM and PM and that tension had to be resolved to ensure project success. After the meeting, all three individuals had a private meeting. At first, there was little or no communication from either EM or PM and it really was TD who did all the talking. Relying on their long-standing inter-personal and professional relationship, TD tried to convince them that he understood their frustration but the issue will be resolved. In essence, the individuals talked themselves into a resolution and although tension between them had been abated, it had not been fully resolved at that particular time.

Episode 7. Convergence: Solution Found

Like before, the level of interaction and communication between the two companies was intense, especially between TD, PM and EM. Within a relatively short period of time, the problem with the film was located and a simple alteration to the sealing formula was devised that would rectify the current problem. Both parties were confident that the Chubb X3 film would work. In addition to solving the misplace product problem, the development team also came up with an additional innovative alteration to the film, that would not only reduce waste but speed up the rate at which the film went through Farmfresh's production process, significantly increasing efficiency. Moreover, the alteration also dramatically sped up Packfex's actual production of the film and stock turn-around, thus eliminating Farmfresh's need to hold vast quantities of stock.

Epilogue

Chubb X3 film was developed and far exceeded the expectation of both companies, running at efficiency levels between 2 and 4 per cent, far surpassing other films at industry average of approximately 8 per cent. Due to the success of the product and the strong relationship between both companies, Farmfresh's corporate buyer (with whom many inter-personal relationships have now been formed) asked Packfex to become their joint number one supplier on all packaging. For Packfex it meant that their sales would increase by at least 7-9 million euro in 2006. Both companies are currently in the planning stages of collaborating again on Farmfresh's other packaging films.

Conclusion

Providing a thick description of the critical interaction episodes that occurred between a manufacturer and a user during the early stages of NPD was the central quest of this study. Yet, the description presented as attempted to avoid leading the reader to a pre-ordained conclusion. Rather, this study encourages readers to draw their own conclusions based on the narrative provided, thus potentially stimulating discussion amongst other academics and practitioners alike. Nevertheless, looking at the extant literature, there are a number of insights that are relative to this study.

First, the research clearly illustrates the value of close inter-organisational relationships and the shared relational norms inherent within them, especially in relation to the continuity of the relationship. Perhaps in other instances, where norms of cooperation were not present, a relationship might have broken down under the stress experienced by Packfex and Farmfresh. However, because these two companies, had through a long-standing 20-year old affiliation, established a social order, a considerable amount of shared knowledge about each other and about how things are suppose to be would have been shared (Buchel, 2000). Indeed, over the last twenty years, both Packfex and Farmfresh would have developed a deep psychological understanding of the others identity (Turner, 1987), and so would have developed their own routines for interacting (that is, perceptions of the way things are done) and working together (Doz, 1996). Hence, the effectiveness of their collaboration. Indeed, the importance of their shared inter-organisational memory, their shared language, their shared understandings and their shared routines highlights the significance of close relationships in facilitating cooperative interaction between the collaborating partners, and provides additional support for the theory of social exchange, that is, close relationships are embedded in a social structure (Granovetter, 1985; Blau, 1964).

Second, the research clearly highlights both the positive and negative influence, inter-personal relationships can have on an inter-organisational relationship (Arino et al. 2002). Emanating from the case narrative is the important role inter-personal relationships played in the resolution of conflict and is consistent with a the view, that in times of stress, informal relationships can act as a strong force of resolution (Arino et al. 2002; Ensley et al. 2000). It also confirms Spekman et al's (1998) contention that inter-personal relationships act as safety nets that protect cooperative arrangements from self-destruction especially when expectations are not being realised; emphasising the crucial significance, inter-personal relationships has on the continuity of the relationship (Hutt et al. 2000; Håkansson and Snehota, 1995; Ford, 1980).

Third, this contribution also advances the existing literature on user involvement, by illustrating that user involvement is a 'evolutionary', 'messy' and 'difficult' process, in which a multitude of dynamic processes have to come in to play, to create a social order that facilitates cooperative behaviour. The complexity, intrinsic within user involvement arises because actually involving users to an intense level requires a collaborative approach. Indeed, the complexity is clearly evident in the observed cycle of alternating divergence and convergence that the manufacturer and user went through in the establishment of a shared understanding of accepted and expected behaviour. Moreover, even when an established social order was present, they still had to go through conflict emergence and conflict reduction, indicating that stability in a relationship may never be fully achieved. While not all conflict leads to potential dissolution, the extent to which conflict is handled depends on the extent to which relational norms are present in the relationship. Indeed, this is the next research step the authors are undertaking by looking at the handling of conflict and change in close collaborative relationships.

Another research implication of this study concerns the question, of whether these findings apply beyond this research project. Further research could be utilised to refine, modify or confirm findings by replicating the study in a larger case population. Moreover, a quantitative approach to these case findings could also be performed. Future quantitative research could address the impact of different variables identified in this work, on the development of a social order in emergent and close relationships. By studying larger populations, reassurance is given that the findings developed in one case are not wholly idiosyncratic. Finally, by focusing on industrial markets, the present study is limited to studying the involvement of industrial users in the early stages of new product development. However, industrial users are just one group of many possible external partners in predevelopment activities, such as, end-consumers, suppliers, research institutes, competitors and governments.

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