

# A SMALL BUSINESS AS INVESTOR A SINGLE CASE STUDY OF A TECHNOLOGY ADOPTION

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In a fast changing environment a continual improvement in terms of identification, evaluation and implementation of new technological innovations is a critical factor for organizational productivity, competition and survival. The purpose of this paper is to scrutinize a technology adoption process of a small family business applying innovation adoption and diffusion frameworks. The empirical part of the study investigates an adoption process in which a small food processing company adopted a new aseptic packing machine. The internationalization of food processing industry combined with growing amount of global raw material sourcing is posing increasing challenges for companies, authorities and governments in terms of guaranteeing food safety. These circumstances offer an interesting and fruitful context in which to study a technology adoption process in a small business setting.

## 1. Introduction

According to Rogers (1995) adoption refers to a decision of any individual or organization to take an innovation in use whereas diffusion is the accumulated level of users of an innovation on a market. Innovation adoption is a micro-level phenomenon in which potential adopter goes through decision-making process and ends up adopting or rejecting an innovation. Cumulative adoption decisions lead to innovation diffusion that refers to a process on macro-level in which an innovation becomes more common in the social system it diffuses. From this viewpoint adoption is a cause that leads to diffusion. In the earlier research this link between adoption and diffusion is however implicit or missing and the term "adoption" may refer to both intra-firm adoption process and market level diffusion process. The second fault, related to the first one presented, in the current body of organizational innovation adoption

and diffusion research is that it falls short in shedding bright light on the episodes and actions taking place during the adoption process of the focal adopter firm and in connecting these episodes and actions to the market level diffusion phenomenon (see e.g. Frambach, Schillewaert, 2002).

There are research papers considering innovations within a small business setting (see e.g. Keizer, et al 2002; Hoffman, et al Parejo, Bessant, Perren, 1998) but the phenomenon of innovation adoption has been mostly ignored in this context as far as we know. Due to the fact that innovation adoption and diffusion have been mostly studied from big businesses' point of view this paper adopts a view of a small family business. Derived from the presented shortages in the previous literature the purpose of this paper is to scrutinize a technology adoption process of a small family business applying innovation adoption and diffusion frameworks. The technology adoption process forms our unit of analysis throughout the paper. This paper attempts to draw a clear conceptual distinction between innovation adoption and innovation diffusion with an empirical illustration, and to further understanding of a focal adoption phenomenon in relation to a macro-level diffusion process. Both innovation adoption and innovation diffusion approaches are applied separately to empirical case in order to understand the actions and episodes taking place during the intra-firm adoption process with reference to a market level diffusion process. The conceptual distinction with an empirical application is an essence in order to illustrate the distinction but also the connections between the two separate levels of analysis on the adoption phenomenon as this has not been efficiently established in the previous research.

The empirical part of the paper investigates an adoption process in which a European small family owned food processing company adopted a new packing machine for aseptic packing. To respect the wish for anonymity we call the adopter company as FoodCo and the supplier company as TechnologyCo. The research strategy is to study the technology adoption process from the adopter company's point of view and support that view by interviewing all the other outsider actors who took part into this process. The case is chosen because the investment was relatively big for FoodCo as the investment was worth over 15% of the annual turnover of the company. The food processing sector is also in an interesting phase at the moment as the internationalization of food processing industry combined with a growing amount of global raw material sourcing, is posing increasing challenges in guaranteeing food safety. These circumstances offer an interesting and fruitful context in which to study a technology adoption process in a small business setting. Finally the work is put together in findings and discussion section and ideas for further research are fed under conclusions.

The adopted packing machine includes a disinfection function that was radically new and beneficial for the adopter and hence can be considered

as an innovation from the adopter's point of view (e.g. Damanpour, Evans, 1984; Cumming, 1998). In the empirical context instead of the term innovation the informants used terms, investment, product, or packing machine, to refer to the adopted technological innovation and therefore we use these terms synonymously in this study. For the same reason, investment project, or simply, project, refers here to the innovation adoption process. The term organizational here means that a unit of adoption is an organization not an individual in this study.

## **2. Innovation adoption and diffusion research**

Adoption and diffusion of innovations has been studied within various disciplines for example economics (Stoneman, Ireland, 1983; Mansfield, 1961), sociology (Rogers, 1962), geography (Brown, 1981), medical sociology (Coleman, Katz, Menzel, 1957), cultural anthropology (Barnett, 1953) and marketing (Bass, 1969; Gatignon, Robertson, 1985; Robertson, Gatignon, 1986; Gatignon, Robertson, 1989). According to Grønhaug and Kauffmann (1988, p. 4) "researchers preoccupied with innovation are partly unaware of the research done and conceptualizations used by colleagues from other disciplines". However Rogers' (1962) seminal work brought closer together diffusion traditions from many fields and is still the most cited piece of work within this research area.

The idea of Rogers' theory is twofold. Single adoption decisions are meaningful in a sense that they can be aggregated on a macro level as a cumulative pattern of adoption. On the other hand a macro level is meaningful to facilitate understanding of single adoption decisions. Innovation adoption and diffusion is a theory of communication and sees these two perspectives as information spread on a market level and information processing within a single adopter firm. Despite its popularity the diffusion theory by Rogers is a difficult one for this reason. The theory adopts a focal adopter's point of view but also tries to capture a system view at the same time or vice versa. Conceptually this leads to confusion. Especially the term adoption is a very difficult one within this theory in an organizational context. Next we make a conceptual distinction between adoption and diffusion as they are used separately in this study to structure the empirical part.

### *2.1 Innovation diffusion as a context for adoption*

Diffusion as a social process of formal and informal information exchange among members of a social system is a core idea of Rogers' (1962) diffusion theory. He (1962, p. 5) defines diffusion as a process in which an

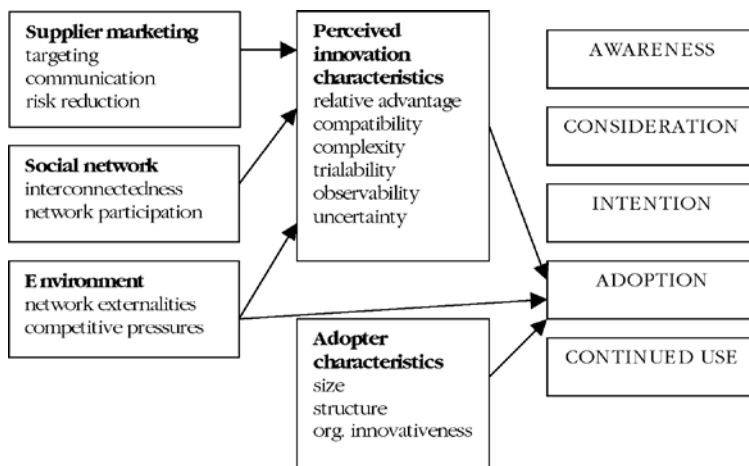
innovation “is communicated through certain channels over time among the members of a social system”. His diffusion theory consists of four major interrelated constructs influencing a diffusion process: an innovation, relevant social systems, time and communication about an innovation. This approach accentuates importance of interpersonal networks within a social system during a diffusion process. Mahajan, Muller and Bass (1990) extend further this idea of communication. They propose that as being a theory of communication the main focus of the diffusion theory lies in communication channels and their use to transmit information about innovation within and into a certain social system.

Communication channels, both personal and impersonal, are crucial for innovation diffusion and adoption. Communication channels spread information that makes a potential adopter aware of an innovation and influence on a potential adopter’s innovation adoption. Basically two concepts have a key position in this communication; opinion leaders and change agents. Opinion leaders are members of a social community in which an innovation diffuses and change agents are actors outside this community promoting change in terms of innovation adoption (Rogers 1962).

## 2.2 A model of organizational innovation adoption

Frambach and Schillewaert (2002) reviewed organizational innovation adoption studies and integrated the main findings within a framework (Fig. 1). They mention that the classical organizational buying behavior models (Choffray, Lilien, 1980; Sheth, 1973; Webster, Wind, 1972) are “largely reflected” in their framework (Frambach, Schillewaert, 2002, p. 164). The model consists of phases of awareness, consideration, intention, adoption and continued use.

Fig. 1 Organizational innovation adoption model (based on Frambach, Schillewaert, 2002)



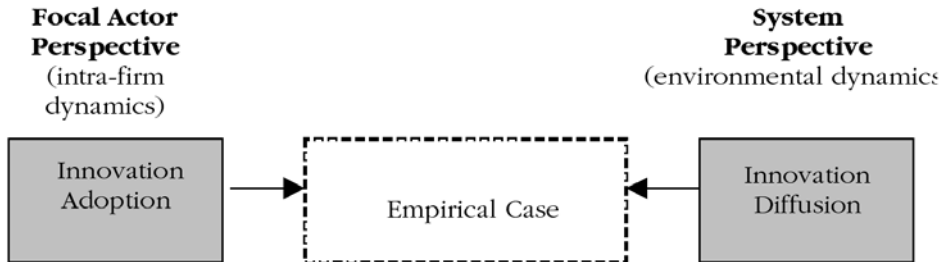
Basing on a literature review Frambach and Schillewaert (2002) propose a set of relations between the presented variable categories and their relations to the adoption decision process that has been put at the heart of the model. However the authors do not clearly argument all their propositions or the influence mechanisms. Adopter characteristics have been attached to affect the adoption decision directly. Size affects positively on adoption as larger companies feel a greater need to improve and support their performance by adopting an innovation. Organization structure may inhibit or advance adoption. More formalized and centralized organizations (usually large firms) are less likely to initiate adoption but are more capable in implementing innovations properly (Damanpour, 1991). More or less self-evident is the organizational innovativeness affecting positively on adoption (Hurley, Hult, 1998). The more important and lucrative the perceived positive innovation characteristics (Rogers, 1995); relative advantage, compatibility, trialability, observability and the less important and pernicious the perceived negative innovation characteristics; complexity (Rogers, 1995) and uncertainty (Venkatraman, 1991) the more likely the innovation will be adopted. Supplier marketing is proposed to affect these perceived innovation characteristics but the mechanism is not reported. Targeting, communication and risk reduction is presented to have a positive impact on adoption via perceived innovation characteristics (e.g. Robertson, Gatignon, 1986). Participation in social networks and their interconnectedness (Zaltman et al., 1973) facilitate innovation adoption via perceived innovation characteristics as well. Environment may influence either positively or negatively on adoption both directly and via perceived innovation characteristics. The existence of external contingencies called network externalities, meaning that benefits of adoption for an adopter increases as a cumulative number of adopters increases, facilitates adoption (Katz, Shapiro, 1994). Another variable in an environment category, competitive pressures, have been reported to have both a positive and a negative affect on adoption. In the marketing literature Gatignon and Robertson (1989) have reported competition to stimulate innovation adoption.

### *2.3 The analytical framework of the study*

The discussed approaches, innovation adoption and innovation diffusion, fall into two categories in Figure 2. Innovation adoption represents a focal actor perspective and innovation diffusion approach forms a system perspective. The classification is based on the connection between innovation adoption and innovation diffusion that was discussed above and defined that innovation diffusion forms a wider context for innovation adoption as innovation diffusion focuses on innovation spread on a market level

and innovation adoption focuses on information processing and adoption decision-making on an innovation within a single adopter firm.

Fig. 2 The analytical framework of the study



The study focuses on the innovation adopter's point of view. By applying innovation diffusion approach the studied adoption process is brought in to the market level and attached to a market level diffusion process of the innovation. The following will represent the case and methodology and then discuss the theoretical approaches in the context of the conducted empirical case.

### 3. Empirical case study

#### 3.1 The research methodology and the studied case

The studied adoption process took place in 2003 at one European small family firm. The adoption decision was made in February 2003 and the packing machine was installed in November 2003. To respect a wish for anonymity of the supplier and the adopter in this case we call the adopter firm as FoodCo and the supplier firm as TechnologyCo. To be more specific, TechnologyCo represents here an agent firm of a foreign ManufacturerCo, but as the project and all the interactions related to it were between FoodCo and TechnologyCo we consider TechnologyCo as a supplier here. From FoodCo's point of view the adopted packing machine was new in a sense that it disinfects the packages before filling them. This feature brought in such benefits that it was an innovation to the adopter.

Due to a lack of knowledge of the organizational innovation adoption phenomenon in the previous literature we chose a historical case study approach (Yin, 1994). Data gathering was conducted by applying a thematic interview method. The strategy of the data gathering was to interview all the actors who took part into this process within the adopter company, the supplier company and within possible third parties. The snowballing

technique was used to identify the individuals who had a role in the process. It became clear in the beginning of the first interview with the owners of FoodCo, who are a married couple, that there were no other individuals at FoodCo in addition to them who would have had any role in the adoption process. Only the supplier TechnologyCo was involved in addition to FoodCo as there were not any third parties engaged. TechnologyCo is also a small business run by few people and hence there were only one person who engaged in this adoption process. In addition to these three persons, the two owners of FoodCo and the CEO of TechnologyCo, there were not any other organizational actors or individuals involved in the adoption process. By interviewing these three we got an extensive idea about the adoption process. The data has been collected between 1st March 2006 and 12th April 2007. The owners were interviewed twice together (the first interview lasted 3 hours and the latter 4 hours) and the supplier once (1 hour). In addition to that some brief questions has been posed by phone calling in order to specify some issues more deeply during the analysis phase.

Themes of the interviews have arisen from the reviewed theoretical field but their role has been more supportive rather than compulsive or restrictive in order to structure the interviews but also to leave room for new topics to be arisen. Minzberg, Raisinghani and Theoret (1976, p. 250) wrote that "tapping the memory of decision-makers could introduce two forms of error, distortion and memory failure." They reported that the use of multiple interviewing was used to reduce the possibility of random distortion in their study. What comes to memory errors, they believed that there is no doubt that some features or bypaths left unreported. Similarly in our study we used multiple interviewing and due to that the distortion is less likely compared to trusting on a single time interviewing or a single interviewee. During the interviews the researcher felt the atmosphere in the situation and believes that the minor controversies concerning some little details between the first and the second interview at FoodCo and between the interviews at FoodCo and at TechnologyCo were memory errors not distortion. The memory error was tried to be diminished in our study by choosing an adoption process that took place quite recently (2003).

### *3.2 The adoption story in a nutshell*

The studied adoption process deals with improving a production line that produces a product that differs from the other products of FoodCo and is the most profitable. FoodCo itself has already a well established position and a fairly long history but this product was fairly new at that time of adoption. Two packing machines were used to pack the product before this adoption. During the first two years after launching the product to markets the production was packed by one machine. After these two first years an-

other machine was acquired to run in parallel with the first one. The third machine, scrutinized here, replaced the very first one. The capacity was not sufficient anymore as the sale of the product had risen heavily and the rise was expected to continue. In this situation FoodCo needed to assure that it can meet the needs of the retailers and supply them with sufficient quantities. The packing function was an evident bottleneck in the production and therefore a new packing machine and improvements on the packing line was an essence. Although FoodCo could have adopted a packing machine without the disinfection function, they thought that a rising trend of purity and avoidance of preservatives in food may lead to a situation that in the future aseptic packing is more important and as a small company they cannot afford to make a replace investment in a near future. The idea of purity and organic production is also a key theme in FoodCo's business vision.

The second machine, which is now run in parallel with the third one scrutinized here, was also supplied by TechnologyCo. Both of these machines are automatic but the previous one does not include a disinfection function. The maintenance, spare parts, communication with the supplier, and the ease of use as the both machines are basically very similar were such evident benefits that FoodCo decided not to be in contact seriously with other technology suppliers during the adoption process. The only other option they consider in addition to this adopted one was a supplier whom was suggested them by another food processing firm. The price of the suggested machine was around half of the price of the invested one.

#### **4. Assessing the case through the theoretical approaches**

##### *4.1 The revised adoption model*

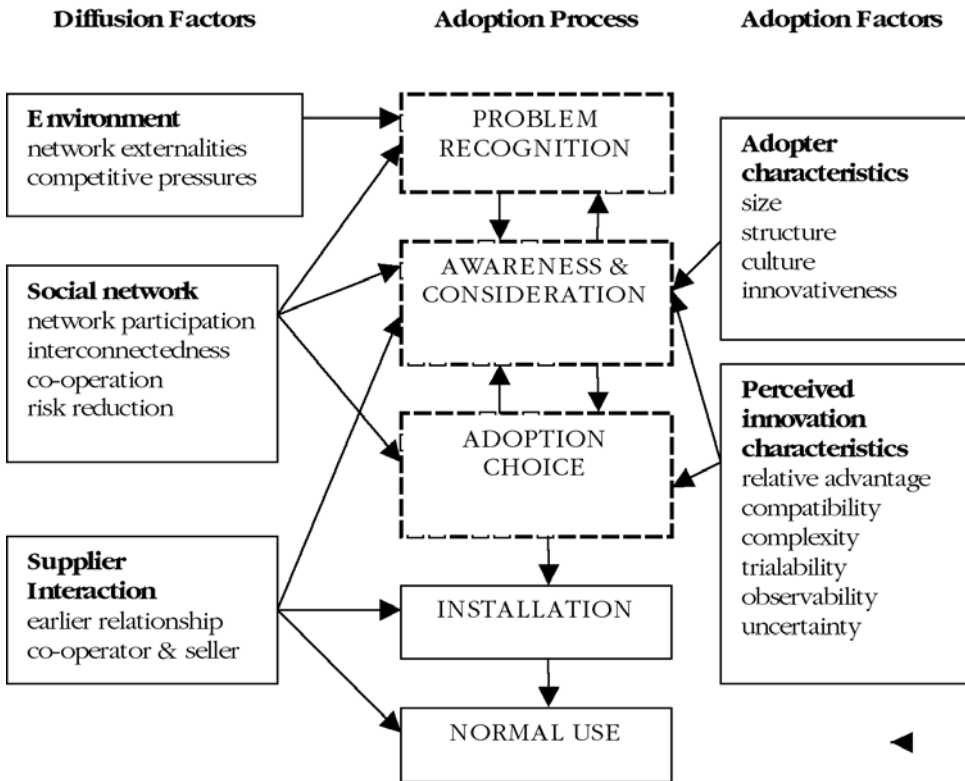
The following model (Fig. 3) has been revised from the framework model of the study (Frambach and Schillewaert 2002, p. 165) that was presented in Figure 1. We included into the same framework both the reviewed literature of innovation diffusion and innovation adoption as the information gathering activities attach the focal intra-firm adoption process to a market level diffusion. This inclusion does not mean consolidation of these two approaches under no circumstances as opposite to the earlier research we make a clear difference between these two levels of analysis in our discussion. On the left hand side in the model are presented the diffusion related factor groups; environment, social network and supplier interaction. In the middle of the model is placed the phases of the adoption process and on the right hand side the adoption related factors groups; adopter characteristics and perceived innovation characteristics.

We renamed the adoption phases as problem recognition, awareness & consideration, adoption choice, installation and normal use to better meet



the reality in this case. The dashed frames of the first three phases illustrate their overlapping as these phases were mostly cognitive actions of the two owners, not well structured processes neither clearly defined. Different from Frambach and Schillewaert model we do not propose links between the factor categories in a form of arrows but rather discuss in the text below how different factors are interlinked in this case.

*Fig. 3 The revised model of the studied adoption process*



#### *4.2 Diffusion related factors and the adoption process*

We considered and defined diffusion as a context for adoption in the theoretical framework. Innovation diffusion approach understands single adoption decisions and information gathering with reference to other adoption units' adoption decisions within the social system (opinion leaders) and change agents' influence on these adoption decisions from outside the community. The idea is that the intra-firm level adoption process of FoodCo is embedded into a macro level diffusion process. This connection

is shown throughout the data.

Competitive pressures stimulate FoodCo to secure the production by acquiring a new machine. The sales had risen strongly and there were clear pressures to make sure that the capacity is sufficient to meet the retailers' needs. If there would have been serious problems to deliver, the retailers may have dropped off the product from their product ranges as the firm is little and do not have much power to affect the retailers.

The social network affected the adoption process during the first three phases when FoodCo was considering adoption. The adopted machine was the first one in this country and hence there was not any earlier adopter (network externalities) whom to ask about experiences on functionality and information about practical issues. In the other European countries this machine has been adopted by some food processing companies (according to FoodCo this was 36th machine sold totally) but the owners did not feel it necessary to visit any reference place or consult any user when the supplier offered that kind of option. The supplier thought that this was because of the very scarce time of the owners as the business is small. Although the already occurred diffusion has left other traces and was exploited in a form of reference list and reputation for example. The owners said that most important for them was to know how many of these machines had been sold in Europe: *"that kind of machines that have been sold only marginally are not needed here neither, it is too uncertain"*. Even though the sales of this type of packing machine with a disinfection function has just lately started the company that manufactures these packing machines has operated already a long time on this field of industrial packing and is a well known player with good reputation.

As the adoption decision was done quite independently there were not clear opinion-leaders affecting FoodCo's decision-making. As opposite to the group of potential adopters or already adopted ones FoodCo had some unofficial discussions with the couple food processing companies that FoodCo has good relationships and often informal discussions with. These companies criticized the decision to invest in an aseptic packing machine. However the entrepreneurs ignored this criticism and thought that it was because of lack of knowledge of the solution and jealousy.

*"Encouragements we did not get in this case, mostly the others didn't understand this choice."*

*" We think that these people do not understand our vision of this purity and therefore cannot understand this investment. They think that it is a too little market share, but it's growing... In general we have used to find our own paths what comes to this product and its' production."*

FoodCo did not really scan for the other options in markets due to the earlier relationship with TechnologyCo and certain benefits of having two similar packing machines.

*"We were not able to assess the technical performance and details but we trusted on TechnologyCo."*

*"But it was not an emotional decision this latter one, not only because of the same supplier, but we considered that the benefits of the same supplier are so evident. And the first one has functioned well and the repairer who comes once a year is perfect."*

The adoption process can be seen as a complex episode within the relationship between FoodCo and TechnologyCo as the companies had already a well established relationship. This ongoing relationship between FoodCo and TechnologyCo structured the interaction and its atmosphere during the adoption process. The interaction between the companies was fairly continuous during the adoption process. FoodCo approached TechnologyCo as the need for a new packing machine was recognized. The characterizing feature of the interaction between TechnologyCo and FoodCo was co-operation to define and specify the solution to meet the current need. Although in addition to this co-operator role TechnologyCo had a role of seller and therefore was not fully aware of all the things concerning adoption choice and the factors affecting it. This unawareness came up clearly in the interviews. The interaction between the companies continued and still continues after the adoption process as TechnologyCo installed the machine and overhauls it, and also the previously acquired one, once a year.

Risk reduction in this case is attached more with the social network than with the supplier interaction. The machine supplied by TechnologyCo was not attached with a functional risk, only financial risk in a sense that if the same benefits could be offered by someone else at a cheaper price. TechnologyCo was a change-agent promoting the packing machine it supplied and hence was biased in this sense. Therefore FoodCo was interested to hear others' opinions in order to be informed of other options available if these were known. With this respect FoodCo got a hint from another food processing firm in the social network. The hint regarding a Danish technology manufacturer supplying cheaper aseptic packing machine led to consideration that lengthened the process. Finally this machine proved to be very different without disinfection function at all. However FoodCo was never in touch with this Danish company. Describing is that during the interviews the owners said that they were and usually are interested to discuss these issues with the colleague companies due to get confirmation to own ideas and to perhaps get hints. On the other hand also came up that they do not pay so much attention to these opinions of others but want to do exactly how they themselves feel about. This is because they think that the others cannot have as a good vision of their business as they themselves have and at the end of the day these decisions must be done in respect of this vision not of others' ideas or hints.

*"As a backbone of our business is a strong vision of purity and all the decisions are subordinate to this. Hence we are not so worried about the others' opinions."*

In this sense the information acquisition related to social system is very incoherent in this case. This can be interpreted that decision-making in this firm is not a separate and clearly recognized function but rather even the big decisions like this was are done more or less intuitively. Some information are gathered and analyzed but not systematically. This feature is related to the firm size that will be discussed in the next section.

#### *4.3 Adoption related factors and the adoption process*

FoodCo being a small firm the firm structure affected the shape of the adoption process as the owners are able to do the decisions quite freely. This shortened the process as the adoption process from problem recognition to adoption choice lasted only four months. Due to the small size the personal characters of the owners were strongly reflected on the process because there were not any official standard or routine how to accomplish the task. During this four months period the adoption referred to need specification with the supplier (what kind of packages will be used, what will be the volume etc.) and in addition to that to a kind of self convincing. By self convincing we mean a process and time that is needed in order to become brave enough to make the final decision. This aspect of behavior was mostly related to the informal discussions with the colleague firms, owners' emotions, intuition and business hunch than hard economic facts available. This tendency has been present at the earlier investments at FoodCo as well and it can be said that they have a certain culture that indirectly affects the process. This culture of the courage derives from the earlier and more risky investments that FoodCo had successfully had in the near history. The owners had a very positive attitude towards risk taking and risks in their business:

*"The risks are necessity for business, without risks it is quite difficult to proceed, but we are quite well aware of how deep the boat is sailing."*

This culture can be also called innovativeness in this context. Even though they mostly got criticism instead of support by other firms they trusted on their own vision and forerunneship.

Innovation characteristics were evaluated throughout the process. Due to the disinfection function the machine has a clear relative advantage over the former ones FoodCo had and other options in markets that FoodCo was aware of. Compatibility here refers to compatibility with the earlier packing machine from the same supplier. Same spare parts, maintenance and communication with the supplier were factors raising compatibility. Compatibility means also mental compatibility here as the earlier machine and the supplier had already a certain privileged position in the owners' minds and hence they were less likely to consider any other option equally seriously. The perceived relative advantage partially derived from this

compatibility. There could have been other more sophisticated solutions available but in this context they may have not been so lucrative due to incompatibility with the earlier acquired packing machine and an idea of it and of the supplier. The ease of use (low complexity) was due to this similarity with the earlier machine. FoodCo could not trial the machine as the manufacturer started to build it up after the adoption decision. The machines of this company, also other types as the one scrutinized here, were widely used in Europe and that way the benefits of the use were indirectly observable. Uncertainty was related to financial uncertainty, is the machine really worth that and can the same benefits be got at cheaper price from somewhere else. The other positively perceived innovation attributes reduced this uncertainty.

## **5. Findings and discussion**

The purpose of this paper was to scrutinize a technology adoption process of a small family business applying innovation adoption and diffusion frameworks. The conceptual distinction with an empirical application was an essence in order to illustrate explicitly the distinction but also the connections between the two separate levels of analysis, innovation adoption and innovation diffusion, on the adoption phenomenon. This interplay between innovation adoption and innovation diffusion has not been efficiently established in the previous research. Secondly the earlier literature has only scarcely considered the actions and episodes taking place during adoption. Having these shortages in the previous literature back in mind we decided to conduct an empirical case study. Below we briefly underline the most interesting interconnections and features of the already discussed results of the previous section.

In the theoretical section we defined innovation diffusion as a context for intra-firm innovation adoption and presented the key areas of these two theoretical fields. Innovation adoption research considers an innovation, which initiates a certain pattern of behavior finally leading to adoption as a point of departure for the theory. The idea that underlies this approach is that the adopter as rational decision-maker recognizes the potential gains and replaces the old product by the new innovation. Then it is just a matter of time when the new innovation has spread out the markets. This favor towards innovation has been called “pro-innovation bias” in the previous literature (Rogers 1995). However the original stimulus-reaction pattern of behavior underlying the innovation adoption that it is more or less a matter of time when a new innovation become adopted (or rejected) by a certain unit of adoption and a linear path to this adoption decision cannot be so straightforwardly confirmed here. In the studied case it was mostly the

need that drove the process, not the innovation. Thus the process was more about to find a solution to a production related problem of insufficient capacity not to decide on this specific and finally chosen packing machine. Instead of this innovation centricity, in which a particular innovation and the path to its adoption is in focus, an *organizational need or a problem* to be solved could be a more relevant starting point because we may easily imagine a situation in which a firm considers different options and ends up adopting only one of them. Thus in addition to one adoption process, there can be found one or more rejection processes.

The process of adoption was connected to innovation diffusion process through *information gathering activities* by FoodCo. FoodCo was interested in solving its problem related to insufficient capacity. As a solution to this problem FoodCo considered packing machine supplied by TechnologyCo. To support the evaluation of this packing machine FoodCo related the adoption process to elements that somehow facilitated the evaluation process. The *already occurred diffusion* of the packing machine, *the opinions of others'* and the *reputation* and the *earlier experiences* of the supplier were elements used in evaluation. The occurred diffusion told the company that how many other companies had made an adoption decision until this far. FoodCo was not interested to see any reference place or to discuss with the earlier adopters but was satisfied to know that there were already some others who had adopted. Instead of discussing with the earlier or potential adopters FoodCo considered the issue briefly with two companies it used to have informal relationships but who were not even very potential adopters at all. This was surprising result and atypical in the earlier literature that emphasizes interactions within the group of adopters and potential adopters. The earlier experiences FoodCo had on the supplier and the good reputation of it were in favor for adoption. The first three phases (problem recognition, awareness & consideration, adoption choice) of the adoption process occurred mostly in the minds of the two owners and therefore it is very difficult to make a clear distinction between the organization or organizational factors and owners as individuals and individual related factors. There were not much physical traces left from these phases of the process. The installation phase was conducted by the supplier and after that this packing machine replaced the very first acquired one and has been used normally in parallel with the second acquired one.

## 6. Conclusions

We have to admit that there is a huge gap in our understanding of what happens within a firm when it adopts an innovation. The organizational innovation adoption literature has not shed a bright light on this issue until

this far. The underlying stimulus-reaction idea of current adoption models seems to capture some features of the process but the models are still too mechanistic and general to explain how different factors evolve and interact with each other during the process due to the facts discussed in this paper. Therefore we believe that the future research attempts should still holistically focus on actions and episodes during adoption. That kind of work would contribute the field of innovation adoption and diffusion on the both identified levels. Also further research attempts in a small business context would open up our eyes to see something that has been ignored in the studies concentrating on big businesses only. At least the interplay between the *individual characteristics* of the entrepreneurs and the *organizational characteristics* presented in the model would need a closer look in the context of small business adoption research.

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## **Abstract**

In a fast changing environment a continual improvement in terms of identification, evaluation and implementation of new technological innovations is a critical factor for organizational productivity, competition and survival. The purpose of this paper is to scrutinize a technology adoption process of a small family business applying innovation adoption and diffusion frameworks. The empirical part of the study investigates an adoption process in which a small food processing company adopted a new aseptic packing machine.

The internationalization of food processing industry combined with growing amount of global raw material sourcing is posing increasing challenges for companies, authorities and governments in terms of guaranteeing food safety. These circumstances offer an interesting and fruitful context in which to study a technology adoption process in a small business setting.

## **Riassunto**

In un ambiente in rapido cambiamento, un miglioramento continuo in termini di individuazione, valutazione e attuazione delle nuove innovazioni tecnologiche rappresenta un fattore critico per la produttività, la concorrenza e la sopravvivenza di un'organizzazione. Il presente articolo si propone di analizzare un processo di adozione della tecnologia in una piccola azienda a conduzione familiare che introduce schemi di innovazione e di diffusione. La parte empirica dello studio analizza un processo di adozione in cui una piccola azienda alimentare ha introdotto una nuova macchina per il confezionamento sterile dei suoi prodotti. L'internazionalizzazione del settore della lavorazione alimentare, associata ad un sempre maggiore approvvigionamento di materie prime a livello globale, sta ponendo sfide crescenti alle aziende, alle autorità e ai governi in termini di garanzia della sicurezza alimentare. Tali circostanze offrono un contesto interessante e fertile per analizzare un processo di adozione della tecnologia all'interno di una piccola azienda.

**Classificazione Jel:** L 20.

**Parole chiave (Key Words):** Adozione di tecnologie; diffusione tecnologie; piccola impresa familiare (Technology adoption; Technology diffusion; Small family business).