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THE ADOPTION OF ICT IN SMALL AND MEDIUM-SIZED FAMILY BUSINESS. THE ROLE OF YOUNGER GENERATION

Francesca Maria CESARONI *
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The aim of this paper is to understand if the involvement of younger generation in small and medium-sized family firms can encourage a process of technological innovation, realized through the introduction and use of Information and Communication Technology. Younger entrepreneurs, that we call digital successors, compared to their predecessors, has a higher level of education and, living in an era dominated by electronics and digital information, should be able to exploit the new technologies in business organization and management. The new generation has skills, energy and innovative spirit necessary to start the process of technological innovation. From the methodological point of view, this work is based on a qualitative research involving two case studies. In both the family firms analyzed the involvement of the younger generation promoted the adoption of ICTs. This study is proposed as an initial moment of reflection to better identify some hypothesis to be tested with further investigations and a quantitative analysis.

Key Words:

ICT, digital entrepreneur, family business, small and medium enterprises, technological innovation, generational change.

JEL Classification: M15, O32.

1. Introduction

The importance of Information and Communication Technologies (ICT) as tools that can deeply affect the competitiveness of the firms (Hitt, 2000; Eisenhardt & Martin, 2000; Sirmon et al., 2007) it is widely recognized. In studies focusing on ICT, however little attention has been devoted to family businesses (FB), despite the significant presence of such firms in most national contexts (Montemerlo, 2000).

In fact, few studies (Ogbonna & Harris, 2005) have investigated the adoption of ICT by family businesses, especially of small and medium-sized family businesses. And few studies have analyzed the ways in which the new technologies are used in these companies. So we currently have a limited knowledge on the following topics: the factors that can stimulate or, conversely, hinder the adoption of ICT by FBs; the way in which these technologies are used, the effects arising from their use and the impact of ICT on the organization and management of the company and on its relationship with the competitive environment and the external stakeholders.

In some studies, the attention has been focused on the factors that can affect the adoption of ICT by FBs.

From this point of view, the importance of the entrepreneur's profile has been particularly emphasized, specifically with regard to age, level of education, past experiences and skills. The age of the entrepreneur seems to be an important factor that can have a deep effect on the innovative propensity of FBs: it is argued, in fact, that the higher the age the greater the risk aversion of the entrepreneur and the lower his willingness to make new investments, to initiate new projects and, also, to invest in new technologies (Ward, 1997; Davis & Harveston, 2000).

Organizational culture is another factor that can affect the opening of FBs to technological innovation and adoption of ICT, as it can contribute to the creation of an environment open to change. It is argued, in fact, that, in certain circumstances, family businesses tend to be averse to risk, less inclined to explore new fields (Sanchez-Peindao et al., 2007) and more oriented to pursue defensive strategies oriented to the conservation and protection of family traditions (Chrisman et al., 2005) rather than open to change and innovation.

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Moreover, especially in small family businesses, the openness to new technologies and the willingness to innovate may be hindered by limited financial resources and poor managerial skills. And this condition may be exacerbated by the frequent reluctance of these firms to engage external managers.

In this context, an important role could be played by generational change, which could represent an important opportunity to spread an innovative spirit within the firm and to promote the introduction of ICT. It is believed that the successor may act as a catalyst of the change by introducing new ideas, specific skills and expertise, which are necessary to successfully manage the use of new technologies. The younger generations can also introduce a new way of doing business, through the exploitation of the potentiality of ICT.

In fact, especially the last generation of entrepreneurs has a high average level of technical expertise, certainly much higher than their predecessors. They are living in an era dominated by technology and are highly familiar with ICT. This is the reason why we can call this new class of entrepreneurs "digital entrepreneurs", as they are more aware of the benefits associated with the use of new technologies and they have a higher propensity to invest in ICTs and use them within the company, in order to exploit all the opportunities that they offer, both for the internal management of the organization and for the development relationships with external stakeholders.

With this background, this paper is organized as follows. The next section is devoted to the analysis of the literature on FBs and ICTs, with particular attention to the identification of factors that can promote/hinder the adoption and use of ICT by family businesses. In the third section we examine the role of family business organizational culture and managerial skills in order to discuss the impact of these factors on the propensity of FB towards new technologies and the use of ICTs. In the fourth section, the attention is devoted to succession and to the opportunities associated with the involvement of the younger new generations. Results of some research, which confirmed the possibility that successors can promote a process of technological renewal of the family business, are shown. In the fifth section we finally present two cases of family business, in which the involvement of the younger generation has allowed the firms to obtain the skills, energy and innovative spirit necessary to start a process of technological innovation. In the sixth section a transversal comment of the cases examined is presented and, in the last section, we report the main conclusions of the work and the implications for possibilities of a future research.

2. ICT and Family Business: a Literature Review

As mentioned, few studies have focused on ICTs with regard to small and medium-sized FBs. Despite the

scarcity of existing works, however, we can find some important information in the literature on this topic. An important contribution also comes from papers dealing with small and medium-sized enterprises (SMEs), as these companies share several characteristics with FBs, even if without they aren't familiar.

A review of the literature on this subject leads to identify two main groups of investigation (Ogbonna & Harris, 2005). On one hand, in fact, we can find the contributions that focus on the impact that the introduction and use of ICTs can lead to companies, in terms of organization, management, relationships with external stakeholders and, more in general, with economic and competitive environment. On the other hand, we can consider contributions that seek to investigate on the factors inducing medium and small-sized FBs to introduce and adopt ICTs.

Regarding to the first group, particular emphasis has been placed on the ability of new technologies to promote the internationalization of family firms, mainly due to their ability to reduce the disadvantages traditionally associated with the small size.

In fact, research on this field have shown that the higher the level of use of ICT by FBs, the higher is probability that the firm involves itself in a process of international expansion (Gallo & Pont, 1996) and organizational growth (Davis & Harveston, 2000).

The second group of investigation is fed by those contributions that focus on the factors that can facilitate or, conversely, hinder the implementation and use of ICT by small and medium-sized FBs. From this point of view, a particular emphasis, even in studies on small and medium-sized firms, has been given to the importance of the characteristics of the entrepreneur, especially with regard to age, education, experience and personal skills (Ward, 1997; Harveston & Davis, 2000). In particular, the entrepreneur's age seems to play a crucial role, since the younger generations are generally more willing to invest in long term periods, because they have a longer horizon in front of them, and therefore a number of years sufficient to benefit of the results coming from the investment.

Conversely, with the advancing of age, the incentive to start new projects decreases and also their willingness to realize initiatives whose benefits can be gather only over the time. Regarding education, it's easy to understand that a higher education level, typical of younger entrepreneurs, positively affects the propensity to innovation, increases the familiarity with new ICTs and increases the willingness to implement technological projects.

Ogbonna & Harris (2005), through the longitudinal analysis of a mature FB, have identified several factors that influence the adoption of information technology: the history of the company, the culture of the company, the

nature of the sector, the relationships with customers and the tenure and age profile of employees.

A common characteristic of surveys on the adoption of ICT by FBs is the use of qualitative methods of research, often conducted on the basis of case studies. In fact it is believed (Hayne & Pollard, 2000; Southern & Tilley, 2000; Hallier, 2004; Harris, 2001) that qualitative methods promote the understanding of decision making processes that lead the firm to adopt and to implement new technologies. Qualitative analysis, therefore, facilitates the understanding of factors that can influence, positively or negatively, the implementation of ICTs.

This methodology has also been used by Bruque and Moyano (2007), who have investigated the determinants of information technology adoption and implementation in small and medium-sized family firms. According to them, the principal factors that can stimulate the decision to adopt information technology are the followings:

- the implementation of quality management systems;
- the process of professionalization of the firm, for example through the involvement of new managers;
- the role of information technology managers, who can act as facilitators of the change;
- the adoption of formal procedures for benchmarking;
- the tension caused by the start of a process of growth.

Opposite effect is rather caused by a shortage of qualified personnel, which can act as an inhibiting factor to adopt ICT.

Among the factors that can facilitate the implementation of information technology, we can consider:

- the parallel introduction of a quality management system;
- the establishment of programs for the training of the staff and improve the level of socialization;
- the adoption of job rotation programs;
- the involvement of providers of information technology.

It is also underlined the important role that the family can have in facilitating the implementation of information technology, especially if the behavior and attitudes of family members helps to increase the motivation and the involvement of other employees. Among the factors that, conversely, may contribute to hamper the implementation of information technology we can consider the importance of the age of employees, the fear of managers to lose power and responsibilities as a consequence of the implementation of new technologies and, finally, the ten-

dency of family members to see information technology as a threat and thus to delay the innovation process.

3. Culture of the Family Business, Professional Skills and Technological Innovation

In studies on adoption and use of ICT, the attention has often been often focused on the role of organizational culture, which may affect the firm's propensity to innovation and therefore may act as a facilitator or, on the contrary, as an obstacle to the implementation and use of information and communication technologies (Fink, 1998, Powell & Dent-Micallef, 1997).

Organizational culture is defined as the coherent pattern of beliefs and values developed and adopted by an organization to address its problems of external adaptation and internal integration (Schein, 1985; Zahra et al., 2004). It constitutes a frame of interpretation and action for the organization as it "tells its members what is right and what is wrong, good and bad, normal and non normal, and so forth" (Hall; Nordqvist, 2008). As such, organizational culture plays a central role in influencing the way companies define and pursue their own strategies, including those involving technological innovation.

With particular reference to FBs, especially small and medium-sized ones, studies on this topic often show conflicting conclusions. Sometimes, in fact, it is affirmed that some characteristics of the family promote the ability to innovate and the propensity to risks (Zahra, 2003). In other studies, on the contrary, it is argued that the typical culture of the family business may hinder the implementation of change processes, including those involving technological innovation.

According to this last statement, it is argued that (Dyer, 1988) especially in the first generation of FB, the prevailing culture is a paternalistic one, characterized by hierarchy, by the dominant role of the founder and by the privileged role of family members, who are responsible for all decision making.

As such, this type of culture acts as a filter (Hall et al., 2001) that influences the ways in which FBs respond to external challenges and can make them resistant to change and not able to exploit new opportunities, such as those associated to adoption of new technologies.

Moreover, many empirical findings have widely documented risk aversion that characterizes family firms and that leads them to conservation rather than to innovation (Sharma et al., 1997). And this is the reason why they are less inclined to innovation compared to non-family firms (Ward, 1987; Donckels, Frohlick, 1991; Kets de Vries, 1993; Gallo, 1995; Gomez-Mejia et al., 2003; Kellermanns et al., 2006).

Although these firms are the result of the innovative idea of their founder, who permeates every aspect of the

business (Davis, Harverston, 1998), the family business seems to develop over time a particular risk aversion. According to some scholars, this attitude stems from the desire to preserve the business and the family wealth to pass them on to succeeding generations (Donckels & Fröhlich, 1991). Other authors believe that this attitude may increase with the involvement of younger generations, if the heirs become responsible for the management of the company without having the necessary entrepreneurial skills. This condition causes the successors to seek conditions which stabilize and enhance the economic rent, to prefer conservation rather than innovation and to any change (Morck, Yeung, 2003).

According to this first point of view, the prevailing idea is that family firms are more averse to risk and less inclined to explore new fields (Sanchez-Peinado et al., 2007), and these characteristics represent an obstacle (Chrisman et al., 2005) to the implementation of strategies of technological innovation, especially in FBs with a long history and a strong cultural tradition (Ogbonna & Harris, 2005).

The problems of FBs in small and medium-scale on the adoption and deployment of new technologies may be aggravated by the situation of weakness that often these companies have in terms of provision of professional and managerial skills. The ability to successfully adopt new technologies and use them to develop new ways of doing business, to acquire new sources of competitive advantage and to adopt new ways to interact with the market, is in fact positively related to the ownership of adequate professional skills, often not available in small and medium FBs (Heck, 1998; Kuan & Chua, 2001). The reason is that in these kind of firms family members usually have the full control of the company and the presence of external managers is often very limited.

On the contrary, the introduction and effective use of ICT requires in the company a high level of professionalization about information systems and technologies, often not available within the owner family and obtainable only through the involvement of external experts. Just the cultural characteristic of the family business, in fact, may act as a barrier and hinder the enrichment of skills, given the difficulty of these firms, especially those small and of first-generation, to change in the organizational structure, delegate decision-making power and to allow space to external mediators with qualified expertise for the management of the processes of technological renewal and for the adoption of ICT.

In fact, in FBs, the goals of the continuity and the conservation of independence and control, which increase the reluctance towards the entrance of external subjects, also for the fear to modify models of established behaviors (Gallo & Sveen, 1991) are often prevalent. It is precisely this attitude that may explain why the family firms often encounter problems in adopting new technologies, since the role of managers is often crucial in

deciding on the adoption of ICT and on modalities and effectiveness of their use (Ogbonna & Harris, 2005).

Other studies have reached different conclusions. In fact they have shown that family businesses aren't less likely to change and innovation than non-family ones (Gudmundson et al., 2003; Nieto et al., 2009), but simply they adopt different ways to develop their innovative capabilities, which are not based on professional staff and formal R&D structures, but are powered by the family-business interaction (Nieto et al., 2009).

The mutual influence between these two systems creates a unique mix of features and resources, that Habbershon et al. (1999; 2003) define "familiness". These resources, if properly managed, can lead to develop innovative processes and help to improve business performance (Nieto et al., 2009).

Other studies confirm that the involvement of family members in the property and/or management has a positive effect on innovation (Sharma et al., 1997; Gudmundson et al., 2003; Zahra et al., 2004; Zahra, 2005; Craig, Moores, 2006). In fact family members are physically and emotionally tied to the company and therefore more motivated to acquire tacit knowledge about the company and to establish strong relationship with customers, thus developing a better chance to identify unmet needs in the market and internal areas of potential improvement (Nieto et al., 2009).

Litz and Kleysen (2001) stress the importance of interactions between different generations of entrepreneurs and between family and other stakeholders in order to develop the innovative capabilities of the firm.

In conclusion, generational transfer is a crucial step in the life cycle of the family business. Thanks to the involvement of the new generation and the identification of a new leader, with entrepreneurial spirit and talent, succession can lead the family business to develop a "state of permanent alertness" (Nieto et al., 2009) toward innovation, and so be able to respond effectively and efficiently to market evolution and to technological innovation.

4. The Opportunities of Generational Change and the Role of the Younger Generation

The above considerations suggest that a decisive role in determining a change of attitude towards the family firms on technological innovation, and in particular on the implementation of ICT, could be played from the entrance in the company of younger generation. Young entrepreneurs, in fact, could act as important catalysts for change, either because they can make available to FBs those professional skills, not owned by his predecessor and not available within the company, which is essential for achieving successful processes of technological renewal, and to stimulate a process of

cultural renewal and encourage the firm to undertake new ways.

Indeed it is asserted (Cesaroni & Sentuti, 2010) that the succession, when properly governed, may represent an important opportunity for the development and growth of family business, and for the renewal of the business formula and the introduction of change in DNA of the firm. The arrival of a new leader who, for personal attitudes, knowledge, learning and working experiences, is able to replace its predecessor by providing innovative skills and effectively lead the change, may represent for the company the turning point, the way to exploit internal and external potentialities and to maintain or recover appropriate levels of competitiveness.

The main skills of the successor, considered necessary to ensure the survival and the competitiveness of the company (Schillaci, 1994; Favotto, 2002; Vergani 2003) are: the "new vision" of the business, the "innovative capacity" or rather the propensity to change, positive attitude toward what could be an improvement in the corporate system and the ability to manage the change.

The succession may represent an important opportunity to generate processes of renewal, to rationalize and improve the company or to introduce the changes necessary to consolidate the sources of competitive advantage (Compagno & Gubitta, 2004) and to ensure the maintenance of adequate levels of competitiveness in the medium-long term.

This necessity is stronger, especially in small family businesses, whose the property is wholly owned by the family, also engaged directly in the organs of government and management and where there are only familiar people. This type of FBs, defined by certain authors domestic (Corbetta, 1995) is traditionally stable (Marchini, 1988) and is not growth-oriented by entrepreneurial choice. It is the reality of many small Italian firms typically much focused on the figure of the entrepreneur and strongly identified with the family, which remains the main, often the only source of resources (entrepreneurial, managerial, professional, financial and operational). They can remain unchanged for generations, but often it is the generational change that starts a process of growth and development that allows them to exploit market opportunities and/or technological innovation.

The achievement of this result, however, is subject to certain conditions, firstly the presence of a new generation with qualified managerial and managerial skills (Dyer, 1989; Hall & Nordqvist, 2008) which are essential to face the complexity associated with the change and to effectively manage new strategic decisions. Some empirical studies and some surveys can be referred to confirm the ability of new generations to renew the FBs and, more in particular, to

promote the adoption and use of ICTs. A qualitative study recently conducted in Italy (Cesaroni & Sentuti, 2010) for example, analyzed the processes of succession of 14 small and medium-sized Italian FBs, in order to identify the nature of the changes introduced in the company through the new generation and the possible factors that can act as facilitating factors for the change.

Regarding the nature of the changes introduced in the analyzed firms, the survey showed the absolute prevalence of innovative information systems, ICT and marketing. These are areas too far from typical traditional skills of entrepreneurs, that, instead, are close to the role of the new generation, which in these companies enrich and enhance the intangible heritage of knowledge and skills available in FBs. Young entrepreneurs, in fact, provide new skills and professionalism inside the company, including those relating to the use of information technology, used to develop new ways of business and to undertake new development paths.

From the research, information concerning the contextual factors that can stimulate the process of renewal and promote the innovative contribution of his successor are emerged.

In particular, it is important to consider the following factors:

- training of successor, as high education and as professional experiences made in other contexts;
- skills and expertise provided by the successor: in all examined cases the new generation has brought new knowledge and skills, and thus helped to enrich the company's intangible heritage. The new generation has also demonstrated the capacity required to manage the complexities relating to the change;
- openness of predecessor who left, to the next generation, with his support and collaboration, space to experiment new business modalities.

Companies involved in the investigation, just mentioned, were members of the manufacturing sector. The ability of the younger generation to foster the technological renovation of enterprises and the adoption of ICT, however, is also supported by statistical data on the Italian agricultural sector. ISTAT data from Census of Agriculture (2000) in fact, show as farms managed by young are more dynamic, more prone to risk and to introduction of technological innovations, more available on the use of Internet and other technologies (Bortolozzo & Tarangioli, 2005).

In the same direction are also the results of a survey carried out recently in Italy in the tourism sector (CISSET, 2008) which emphasizes the 'affinity' between successors and new technologies, often introduced, in

tourist companies, by new generation. From this point of view younger people, are more familiar with ICT and, more generally, openness to new and to sensitivity towards technological innovation factors that promote the spread and use of new technological tools, that are linked to important processes of renewal in the form of new organizational and managerial solutions, new services, new ways of managing relationships etc...

In travel agencies and hotels, where the ability to gather the opportunities offered by Internet is an essential element for the success of the technologies, are one of the main areas of intervention of the young generation. Therefore, this research shows the profile of a new generation of entrepreneurs for whom the new technologies do not constitute a threat, but are, on the contrary, an important opportunity to renew the company, to adopt new management procedures for improving processes and performance of the company, to redefine its relationship with external stakeholders and to implement new strategies, based on success factors.

To obtain these results, the deep knowledge of new technology, obviously, plays an important role. But equally crucial is the entrepreneurial energy, the stimulus to the renewal, the opening to a new vision of the world and of the business. The latter conditions often make the difference between the new generation of entrepreneurs and their predecessors and playing a key role in determining the results obtained by these new technological tools.

5. New Generations and Technological Renewal of Family Business: Two Case Studies

In this section we present two case studies, hereafter indicated as Mechs and Furns. The common feature of the two firms is the presence of a new generation that some years ago acquired the leadership of the company, contributing significantly to its technological renewal, with particular regard to adoption and use of ICTs.

5.1 The case Mechs

The Mechs is a family business, wholly owned by a family. In turn, Mechs, controls other two companies: Alfa SRL and Beta SRL. The family holding, in turn, controls another company Gamma SRL that produces heat exchangers. The core business is the cold forming of metals and assemblies. In 2005, Mechs has internationalized the production with two factories in Romania and Moldova. The high specialization and high elasticity of products and processes supported by know-how and unique expertise in the sector, place Mechs in a reference position for the international market, guaranteeing high quality of performances. At present the company has over 100 employees, 15,000 square meters of plants and international and prestigious customers.

The founder, father of the current CEO, with high education (it is a mechanical engineer) had a limited familiarity with information technology. He has certainly developed a lot in terms of mechanical technology, but the daughter, management engineer, has contributed to the improvement and diffusion of ICT inside the firm. At present, from few computers used in the past, the fleet of machines has increased considerably. In the company's headquarters, at present, there are about fifty computers and four workstations for CAD technical design. In the last year, the company has renewed hardware with many servers virtualized in a data center that has several features: fax, mail, documents, management, administration and production.

Over time, thanks to the contribution of the young daughter, the figure of ICT responsible is evolved. Until sometime ago, in fact, the information system and hardware and software were managed directly by the CEO, who was aware of its limited technological skills. Just its consciousness led her to engage an external figure, a Chief Information Officer (CIO) a computer engineer, who works inside the firm some days for week. This figure was necessary not only to solve technical problems but also to make available to the company the skills necessary to design an effective information system and to manage all ICT components. The CIO also works as an interface with ICT suppliers (hardware, software, and networking).

The company, in recent years, used the latest version of ERP Gamma Evolution. In the opinion of the CEO, the costs associated with this management system are high and this is one of the reasons that led her to think of his replacement. This decision, however, is currently delayed, because the recent crisis leads to be prudent and to postpone expensive investment plans. In addition to the cost, there is however also a problem of efficiency, since it is a management system also dated. Another limitation is the difficulty to enable electronic exchange of data with the information systems of some customers, especially the bigger ones, that use the protocol Electronic Data Interchange (EDI).

At the same time, however, it is recognized that the system, adapted to its processes, had the merit to be responsive to the needs of the company, reflecting carefully on his replacement. Despite these perplexities the company's intention is to replace the existing management system with another system currently used by Gamma, firm controlled by Mechs, who has very similar managerial and organizational features. Apart from these problems, still unresolved, the inclusion in the company of the new generation has enabled the company to make a big step forward in terms of data quality and efficiency of the system of transmission of information across the firm, especially in the circulation of information flow from production to management and viceversa.

Inside the management software there is a database that contains information for the quality and support to

customer satisfaction. The physical interface with the customer is the responsible for sales and customer development. Periodically, the CEO, technical and commercial office, meet the customers to appropriately modify mechanical designs and projects. Today, all this happens by direct contact and in the future the successor plans to increase the company-customer relationship through virtual channels.

CEO uses the LinkedIn network and he belongs to an innovation group. In this way he can also find some partners with specific skills for specific requirements of the firm. Currently the Mechs not operates with social media like Facebook, Youtube etc., because the opinion of the CEO is that it is most suitable for enterprises that works in a market Business to Customer (BtoC). The Mechs, in fact, produces metal components for third parties and therefore operates in a market Business to Business (BtoB) where customers are other manufacturers. However, in the future, the firm not excludes investments in these interactive technologies, recognizing usefulness and effectiveness. CEO has invested heavily in mobile information, giving managers the possibilities to read e-mails and access to enterprise information system, by BlackBerry and by the protocol Virtual Private Network (VPN) from desktop.

From ERP it is possible to extract useful data for Business Intelligence, such as turnover analysis, production for departments, performance indices, quarterly or daily analysis on sales, estimations, budget and customer satisfaction. In addition, by some graphic dashboards, the Mechs monitor the level of the production and the quality, basing on Key Performance Indicators (KPI).

The CEO is aware that, in the technological field, the Mechs is progressed but at the same time recognizes that there is still much to do. Certainly his presence and even his university studies, marked by the knowledge era, led her to believe more in the adoption of these tools and to think, in terms of medium-to long-terms, with strategic goals. As short-term investments, the young successor plans to further renovate the hardware and infrastructure management software, to increase the use of technology for supporting customer management relationship, to invest in optical archiving of documents (something already made) and to develop electronic invoice with customers using the protocol Electronic Data Interchange (EDI).

5.2 The case Furns

The Furns is a company of 60 employees, that offers innovative modular furniture, customizable and equipped, that can combine design and functionality, but also it is possible to quickly transform and adapt to customer requirements. Enterprise customers operate in various sectors ranging from bakeries, supermarkets, bars, pubs, clothing stores and pharmacies. Lately for furniture of the bars it is created a specific firm inside the group. To

facilitate the choice of its customers, the Furns has articulated its furniture lines in two distinct macro commodities: food and non-food.

For several years, the founder's sons, a boy and a girl, are entered in the company and now share with the father the power to decide. Their entry coincided with the start of a process of technological renovation, made possible by technological expertise in particular owned by the founder's son who has a qualification in electronics and a Bsc in enterprise management. The management of the father, in fact, was characterized by a predominant focus on production and commercial, areas close to its skills; completely neglected was the IT-technology aspect, very far from the expertise of the founder, also for the his low level of education.

Under his leadership, in fact, the company had made very limited investments in information technology. The entry in the company of his son, with good skills in ICT, has been an important turning point for the company, which has invested in technological infrastructure and has begun a general renewal process, which involved a widespread adoption of ICTs. This process, however, was interrupted later by a series of conflicts in the relationship between father and son, which led the latter to leave, for a time, the company. Currently, the relationship between father and son is improved and the son is again involved in the company. The process of technological modernization of the company, however, has inevitably been affected and it is currently in a state of stand-by. In fact, there is not still, inside the company, a CIO and therefore there is not the figure of a responsible to coordinate decisions relative to adoption and use of ICTs.

At management level, the company use the Gamma Evolution ERP (the same of Mechs company) introduced, some years ago, by his successor and then tailored to the enterprise needs. Precisely, for this reason, it is not currently included in the plans of the replacement of this system, although it is accepted that the system is useful especially in the administrative sector, but it has several weaknesses in the management of the production processes.

The period of absence of a successor, and the consequent lack of a manager of information systems, has left open several problems. Today, in fact, there is still no coordination among the various offices of the company, and everyone installs and configures hardware/software packages without any programming and planning. The server brought by the successor is located in a room where employees put their hands and not having technical expertise create problems for the internal network.

Technical, Franchising and Sales Departments use CAD software, with a shared technical library, to exchange, among themselves, production data. For the production department, however, the exchange is not automatic, and

it is necessary that a person manually introduce data in the production system.

How Business Intelligence Solutions, the Furns use the reporting of the ERP system: analysis and statistics on production, sales and daily or quarterly charts. The invoice is sent via e-mail; at the moment the Furns not have customers who use EDI protocol. As before mentioned, all these technologies have been introduced by the founder's son, and under his coordination and direction, the company had reached a good technological level. The process of renewal, begun by his son, had stopped when he has gone away from the company and now, after his return, all problems arising will be analyzed and resolved gradually in order to continue the innovative path undertaken few years ago.

At the moment, the company's website is being redesigned, modified to be more dynamic and interactive with the support of an external graphic. The son also shows a very openness on the use of social networks like Facebook, that he is planning to introduce inside the firm, especially to create virtual channels that allow to establish direct interaction with customers. Over the next years, moreover, it is the intention of the son to introduce other innovations such as: the inclusion of an internal IT manager, the purchase of a software for customer relationship management, the purchase of graphic software Pro/Engineer, the installation of new hardware workstations and the implementation of the virtualization of servers.

6. Analysis of the Cases: a Comparative Assessment

One of the features common to the two cases is the fact that in both the companies the involvement of the new generation marked the beginning of a process of technological renewal, characterized by the introduction of ICTs. At the same time, however, between two companies there are significant differences.

A comparison of the two companies is shown in *Table 1*.

A first aspect concerns the figure of its predecessor and technological expertise in its possession. In the Mechs firm, in fact, the founder is a mechanical engineer and therefore a person with a high education level, certainly with high technical expertise and open to mechanical technologies, but with a lacking of expertise in ICTs. Under these conditions, therefore, the entrance of his daughter was still very decisive because it enabled the achieve of a successful integration between their respective responsibilities; all this for the benefit of the company that was able to continue and go forward in technological innovation processes, even although these investments will be postpone in a period of a greater financial security.

Companies	Mechs	Furns
Type	SME	SME
Business	Mechanics (Metal Cold Press)	Furnitures (bar/pub/super-market,...)
Successor	Daughter	Son/Daughter. ICT asset: son
Education of the (1[^] generation)	Mechanical Engineer	Title of middle school.
Expertise in ICT of the father	Yes (not much)	No
ICT education of the father	Medium	No
Education of successor	Management Engineer	Technical Institute (Electronic specialization)
Presence in the company of the successor	Continuous (uninterrupted)	Discontinuous (interrupted)
CIO	Yes, external CIO	No
Use of Social Network	LinkedIn	Facebook, LinkedIn
Innovation in ICT	Increasing	Increasing, during the period of presence of son in the company. The path of renewal stopped completely with the exit of the son from the company.
ICT improvements	Networking, server, virtualization, CAD, UC, ERP	Networking, CAD, ERP

In the Furns case, instead, the founder had only achieved the title of middle school and was almost completely lacking of technological expertise. In this company, therefore, the entry of new generation, especially in the person of his son, had a decisive effect on the company to make a major leap from the technological point of view. In this company the intervention of the son was crucial in determining the level of technological development of the company, as demonstrated by the fact that the path of renewal undertaken stops completely with the removal of the son from the firm, and then restart only on his return inside the company.

Another difference is the presence of a CIO inside the firm. This figure is in fact present only in the Mechs, although it

is an external figure, involved in the company only few days for week. Despite this partial presence, this is a very important figure who interface with suppliers and solves several technical problems, and mainly, controls and coordinates all operations of new technologies, ensuring uniform strategy and increasing the effectiveness of the entire system. The CIO, in this case acts as a facilitator and stimulator in the use of computers in business processes.

In Furns, instead, there is not a CIO and the role of coordination of ICT activities was held informally by the son of the founder. Although, as affirmed, he has played an important role in stimulating the adoption of new technologies, but his discontinuous presence, inside the company, with the absence of a CIO, may explain the current level of technology of Furns, certainly lower than the Mechs. In the firm it feels the lack of a coordinating role, to give necessary assistance to planning of the use of new technologies, until now, done in a very partial and very fragmented and disorganized modality.

Both successors use, at private level, social networks and social media. Mechs use more professional social network like LinkedIn to join to a community of practice for innovative and research skills to meet business needs or resolve technical problems. In the case of Furns, however, the successor use popular social media like Facebook and YouTube. Although, at present, neither of the two companies have implemented web 2.0 technologies, both are prepared to do this. From this point of view, however, there are differences, primarily due to the different type of customers: Mechs works in a B2B context and therefore forecasts a less use of web 2.0, while the Furns that works in a B2C market and it's more stimulated to use these tools to interact with its customers.

Beyond these differences, however, the two firms can confirm that the entrance of the new generation, in both cases represented by two persons with a high propensity to innovation and open to new technologies, can give a decisive contribution to improve the ICT infrastructure of the company. In both cases, therefore, the involvement of the new generation has allowed the firm with new skills, energy and innovative spirit, that are necessary to start the process of technological innovation.

7. Conclusions and Indications for Future Developments of the Research

The two cases examined show the ability of the new generation to promote a process of technological renewal of the family businesses, characterized by a more intense and more widespread use of ICTs.

At the same time, however, it's obvious that the mere involvement in the family business of the new generation cannot be a sufficient condition to trigger the change. It's necessary, in fact, that this event is accompanied by the occurrence of other conditions, which are essential in order to initiate a process of development and technological innovation of the family business.

From this point of view, the analysis presented in this work provides some useful information to identify some factors that can affect the ability of the successor to act as a catalyst for change.

First of all it is important to point out that the research method adopted in this study presents some limitations that cannot be ignored when interpreting and using the results of the analysis.

As highlighted by recent literature (Tan et al. 2009), in fact, the method of case study cannot be applied to a large number of companies and, consequently, it cannot lead to generalizable results. However this method has the advantage of offering a detailed description of the company and its business and for this reason it allows a thorough understanding of issues that could hardly be highlighted by a quantitative research study.

This means that this study should be interpreted as an initial moment of reflection, useful to address some research questions that must be verified through further investigation involving a large sample of family firms. The qualitative nature of this research could then be integrated using quantitative methods, such as survey analysis, carried out involving a significant number of companies, in order to obtain statistical significant data and reach conclusion with general validity.

With this in mind, the cases examined make it possible to hypothesize the existence of two groups of factors that can affect the ability of the new generation to promote the technological innovation of the family business and the introduction of ICTs:

- the first group includes subjective factor, related to the two main protagonists of succession: the predecessor and the successor;
- the second group includes contextual conditions, both internal and external to the family business.

In the first group first of all should be placed the *possess of qualified competences in informatics by the successor*. In both cases examined, this condition has played a vital role in promoting technological innovation and the introduction of ICTs in the family business. From this point of view, especially significant is the case Furns, in which the innovation process has been intermitted and has followed the same trend that has characterized the

presence of the successor. The temporary exit of the successor, in fact, has caused the interruption of the innovation process, just because it has deprived the company of skills that are necessary to manage the introduction and use of new technologies.

The way in which these competences has been acquired seems less important: even without a university degree, the successor could be able to manage the process of technological innovation, if the lack of a high level instruction is compensated by strong experience and a good knowledge of the family business.

The possess of qualified competences by the successor, however, may not be sufficient to promote the technological innovation of the family business if the successor is forced to struggle with an attitude of hostility and resistance of the predecessor. This means that among the necessary requirement in the first group must be also placed the *degree of openness of the senior entrepreneur*, meaning trust in the abilities of the new generation and acceptance of the change in the company and in its way of doing business. This condition in fact has been fundamental to enable young entrepreneurs to express their capabilities, also dealing with ambitious projects of renewal and development of the family business.

From this point of view, the comparison between the two companies presented in this paper is emblematic.

In Mechs, in fact, conditions that have allowed the future leader to promote the introduction of new technologies are: the cooperative attitude of the senior, his trust in younger generations, the possibility of an open and ongoing support, as well as substantial and increasing areas of delegation.

In Furns, on the contrary, the technological innovation process has been interrupted because of the attitude of closure of the senior, that has caused difficulties for dialogue and understanding, with the final result of causing the rupture of relations between father and son and the exit of the son from the family business.

Regarding the second group of factors, the two cases show the importance of the following ones:

- the sector of the family business, that can affect the need, the usefulness and the convenience of investments in new technologies. From this point of view, therefore, it must be admitted that the analysis described in this paper should be completed with the analysis of other companies, belonging to other industries: commerce, services, agriculture, and so on. In fact it's important to understand the extent to which the sector may affect the company's willingness to invest in ICTs;

- the presence, within the company, of experts able to coordinate the process of technological innovation and to solve technical problems that inevitably arise during this process;
- the economic and financial condition of the company and, more generally, the national and international economic situation in the particular stage of enterprise life cycle. This aspect seems to have played a decisive role in both companies. Both in Mechs and in Furns that, in fact, the process of technological renewal, although started, has not yet been completed and none of the companies have reached a level of technological excellence. As acknowledged even by the entrepreneurs during the interviews, the reason is due to financial international crisis of the last two years that has forced companies to be prudent and to postpone even those technology investments which had already been programmed.

This last consideration is important because it shows that if, on the one hand, the presence of specific subjective factors is a necessary condition so that the succession may represent an opportunity for the technological renewal of the family business, on the other hand, however, the same factors are not sufficient by themselves to ensure this result.

Other conditions are indeed indispensable, particularly related to the context in which the company lives and works. Without these conditions, in fact, subjective factors are likely to be seen as mere potentialities, without the ability to fully express themselves.

The future development of this research should therefore be directed to the identification of these factors and to understand how they may affect the attitude of family business to invest in ICT.

The analysis of the literature and two case studies confirm the hypothesis that the new generation, the so-called "digital successors" use more electronic tools and invest heavily in ICT. The predecessors, older, have invested more in product development, marketing and relations with partners and customers. The digital successors, respect to their predecessors, innovate the management and production of value chain, because they invest in technology and information systems that manage, in optimal and efficient modality, information flow inside the company.

In literature, we have seen how new technologies have a high importance in the management and in business success and how constitute an elements that promotes and facilitates the processes of transmission of the business. New technologies are often the "gateway" through which the junior successor may entry in the company, with a new

role and aided by young age, he can spend some advantages against the experience of seniors. The young successor, using digital tools and participating in discussions and in particular, on social networks and social media, can create and generate new knowledge useful to the business, from the transformation of tacit in explicit knowledge and viceversa (Consoli, 2010a)

ICT, especially web 2.0 tools (chat, forums, blogs,...) are useful to share information and therefore their use has implications also in the social and relational sector, breaking down the barriers that in the past prevented the sharing of knowledge. The social aspect is the basis of communicative values among enterprise and its stakeholders. On Facebook, an entrepreneur faces, suggests and listens other people. The digital entrepreneur has a greater predisposition to exchange information with the external environment (market, suppliers, customers,...) using virtual channels. In the future, we think that the digital successor could implement the model of Enterprise 2.0. that Andrew McAfee (2006) defined as "Use of emergent social software platforms within companies, or between companies and their partners or customers".

Enterprise 2.0 is a breakdown of traditional organization models towards an open and cooperative architecture with external participants. In this model it is important the aspect social network & community. It is fundamental the use of social technologies to generate support to internal and external communities (Consoli & Badea, 2009).

The entrepreneur listening the opinions on a particular product or service, may intervene with corrective actions to improve and deliver a product of quality that fully meets the customer's requirements. From a previous survey (Consoli, 2010b) we have noted that in the field of the SMEs, Enterprise 2.0 is a model not yet fully developed. Only a few number of small and medium enterprises begin

to use some interactive tools into their websites but these tools are not fully integrated with business processes. Clicking on the appropriate button we can enter on a corporate blog, a video of Youtube relative to enterprise products, or share some information on business pages of Facebook.

From this point of view the two cases examined confirm the low prevalence of this type of technology in FBs, although both entrepreneurs said that they are ready to use, in the future, this interactive channel. We believe that the implementation of this model, at the level of small and medium-sized enterprises, will be realized in the future, in parallel, with the progressive entry inside the firms, of a new generation of young "digital" entrepreneurs, with an average level of education higher than that of their predecessors, with a culture more open to new technologies and more predisposed to use them in their daily lives and therefore more aware of their potentialities and benefits. The study realized is proposed as a moment of reflection to identify some research questions that must still be verified by further investigations that will involve a large sample of firms (quantitative analysis). In particular, we consider necessary to increase the knowledge of factors that can influence, positively or negatively, the use of ICT in small and medium-sized enterprises, in general, and in those with family features, in particular. In this context, a particular aspect of the study should focus on understanding the role of the younger generation in promoting the diffusion of ICT in FBs and in particular trying to understand what are the relevant and more interesting attributes of new entrepreneurs from this point of view. Another aspect to clarify will be the analysis and identification of the conditions of the context - management, organizational, economic-financial, personal etc., that can affect the ability of successors to act as catalysts for the change and promote technical renovation of the firm.

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