The Knowledge-Based Foundations of Organisational Performance Improvements: An Action Research Approach

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Abstract: Purpose: The strategic and management literature grounded on the resource and knowledge based view of the firm, has widely outlined the importance of knowledge assets in a company's value creation. However, despite acknowledgment of the strategic relevance of knowledge assets and their management for driving organizational performance improvement, there is still a lack of suitable approaches to disentangle, explain and assess how knowledge assets support the achievement of a company's strategic outcomes. The paper investigates the role and relevance of knowledge assets in a company's performance improvement and provides some approaches, tools and managerial suggestions regarding the leveraging knowledge assets as value drivers for improving organisational performance. **Methodology**: The study is based on action research methodology. **Findings**: This paper highlights the role and relevance of knowledge assets as critical factors to manage for improving a company's performance. In particular, integrating the results of an action research project with the main insights from a literature review, the paper provides some approaches, tools and managerial suggestions mainly regarding: i) the identification and mapping of knowledge assets to be managed in order to improve performances; ii) the choice and the design of knowledge assets management initiatives; iii) the evaluation of the performance improvement gained by the implementation of knowledge assets management initiatives. **Research limitations**: The paper investigates the leveraging knowledge assets for a company's performance improvement in a specific context of analysis, i.e. the New Product Development (NPD) process. In order to have a more holistic view of the interactions between knowledge assets and company's value creation mechanisms, an extension of the investigation to other organisational processes is required. Moreover, to generalise the research's results, several applications in different industries and the use of different research methodologies are required. **Practical implications**: The paper, on the basis of theoretical and empirical insights, provides four managerial practices which managers might use in order to design and implement knowledge assets management initiatives aimed to support the improvement of company's performances. **Originality/value**: The paper provides more light on how knowledge assets and complementarities among them enhance organization's performances and provides approaches, tools and managerial suggestions for supporting managers in developing and leveraging knowledge assets. Especially the proposed approaches and tools intended to provide managers with information to assist them to allocate their managerial efforts to the knowledge assets with significant impact on performance.

Keywords: knowledge assets, new product development, performance improvement, knowledge assets management; action research.

1. Introduction

Traditionally, key assets for a company's competitiveness were physical assets and financial capital. These assets still represent and will continue to represent important factors for competitiveness. However, more recently, due to the complexity and turbulence of the competitive scenario, companies have recognised the need for increasing the level of 'intelligence' embedded in their processes and products and then the importance of continuously improving their core competencies and knowledge. Therefore, looking for new differentiators and drivers of bottom line performance, companies have recognised the relevance of knowledge assets as key sources of competitive advantage (Lev and Daum, 2004; Peteraf and Bergen, 2003; Teece, 2000; 2007).

In particular, in line with the main strategic thoughts provided by the Resources Based-View (RBV) (e.g. Barney, 1991; Penrose, 1959), the Competence-Based View (CBV) (e.g. Prahalad and Hamel, 1990) and the Knowledge Based-View (KBV) (Grant, 1996; Sveiby, 1997), companies have realised that their sustainable competitive advantage results both from the possession of resources that are hard to transfer and accumulate, inimitable, not substitutable, tacit in nature, synergistic, not consumable because of their use and the ways of combining and developing them.

Due to their relevance for organisations' competitiveness, knowledge assets have been and still are at core of an outstanding and fruitful academic debate, started several decades ago. For example, in strategic management field, several researches investigating knowledge assets and providing

definitions both of the contents and the nature of knowledge assets within organisations, have been provided (see for example Nonaka and Takeuchi, 1995; Grant, 1996; Zack, 1999).

In the last decades, with the aim to develop a more managerial and practical interpretation of knowledge assets, the concept of Intellectual Capital (IC) has been introduced and adopted (Edvinsson, 1997; Stewart, 1994; Roos *et al.*, 1997). It can be considered as a holistic concept which embraces the different categories of organisational knowledge assets (Carlucci and Schiuma, 2007).

This concept has driven the development of a number of managerial approaches and tools for the assessment of an organisation's IC, e.g. IC-Index (Roos *et al.*, 1997); Intangible Asset Monitor (Sveiby, 1997); Navigator (Edvinsson and Malone, 1997); Value Chain Scoreboard (Lev, 2001).

From the analysis of these frameworks emerges a broad consensus about the main dimensions of organisational IC. It is interpreted as the sum of three fundamental categories of organisational knowledge assets: human capital, structural capital and relational capital.

The human capital includes knowledge, skills, experience and abilities of people, technical expertise, problem solving capability, but also innovation capacity, creativity, know-how, teamwork capacity, employee flexibility, motivation, learning capacity, formal training, education and so on. Since any business and/or operation process is based on the know-how, skills, creativity, attitude and behaviour of the organisation's people, they are core assets for a company's competitive advantage.

The structural capital includes all organisational infrastructures which can be either tangible or intangible in nature. Therefore, they can be split in two categories: physical infrastructure, i.e. tangible, and virtual infrastructure, i.e. intangible. Both are fundamental for a company's performance and need to be considered together to understand how value can be generated by exploiting organisational assets. In this regards, Lev argues that "intangibles are frequently embedded in physical assets (for example, the technology and knowledge contained in an airplane) and in labour (the tacit knowledge of employees), leading to considerable interactions between tangible and intangible assets in the creation of value" (2001, p. 7). Nowadays, particularly important are those physical infrastructures such as structural layout and ICT, computers, servers and physical networks, which support knowledge development and management. Virtual infrastructures comprise intellectual property, that is assets whose ownership is granted to the company by law, such as patents, copyrights, trademarks, brands and so on, as well as internal practices, virtual networks, organisation routines, corporate culture and management philosophies. These assets are critical success factors for business performance improvement.

Finally, the relational capital includes knowledge assets related to a company's relationships with its stakeholders, such as partnership agreements with suppliers, experts, research centres, or universities as well as relationships with regulators. Relational assets include also commercial power, negotiating capacity, distribution channels, environmental activities and the perceptions that stakeholders hold about the company, for example image, customer loyalty and so on.

All above mentioned knowledge assets can represent important performance drivers and are at the basis of a company's value creation dynamics (Carlucci *et al.*, 2004; Cuganesan, 2005). Especially they contribute to create value not only by themselves but by their interactions (Penrose, 1959; Youndt *et al.*, 2004). Knowledge assets dynamically interact with each other to be transformed into value. In fact, as underlined by Carmeli and Tishler (2004), the "interaction amongst elements is complementary in that the value of one element is increased by the presence of other elements" (p. 1261). The same authors argue that knowledge assets have a positive effect on organisational performance and, particularly, the interactions among the knowledge assets enhance organisational performances.

Despite the wide acknowledgment that knowledge assets operate in the value creation dynamics mainly as bundles, understanding the mechanisms by which these assets interact and impact on business performance still remains a challenge (Dierickx and Cool, 1989; Lippman and Rumelt, 1982).

This paper aims to shed more light on the linkage between knowledge assets and a company's performance improvement. For this purpose we have carried out an Action Research (AR) project in

the R&D department of a big company. The research project was aimed to investigate the dynamics by which knowledge assets are linked to NPD process performances.

The NPD represents a relevant empirical context in which to investigate the complex mechanisms by which knowledge assets influence organisational performances both because it is a knowledge intensive process and because, in today's competitive scenario, the NPD represents a critical process to continuously improve in order to ensure the company's growth and survival.

We believe that a better understanding, grounded on empirical evidences, of the links between knowledge assets and performance improvement can have both theoretical and practical benefits. From a theoretical point of view, this might benefit the KBV and the RBV theories. In fact, as underlined by Carmeli and Tishler (2004), these strategic research streams need more empirical studies demonstrating how intangible elements and complementarities among them enhance organization's performance. While, from a practical point of view, this might improve managers' understanding of the role of knowledge assets in company's performance improvement as well as it might contribute to the generation of approaches, frameworks and tools for supporting managers in developing and leveraging organisational knowledge assets.

The paper is structured as in the following. In the first section, we address the main cognitive characteristics of the NPD process and the role of organizational knowledge assets in the process. In the second section, we describe the AR project. Therefore, in third section, on the basis of theoretical insights and project's results, we discuss some managerial implications regarding the management of knowledge assets. Finally we provide some final remarks for practice and research, as well as we outline both the main limitations of the research project and some recommendations for further development of the research in the field.

2. The role of knowledge assets in the NPD process

In the last decades, the innovation has kept a much more relevant role in determining companies' success. In particular, globalization of markets, dynamic technologies development, product life cycles ever shorter and fast changing of customers demand have involved that the product innovation has a fundamental role for company's competitiveness. In such a prospect, companies seem forced to improve the NPD process performances in order to develop higher quality products and to enhance continuously the value provided to customers.

The strategic importance of NPD has generated a great attention of academics and practitioners on organizational and managerial features of the process. In particular, many scholars have analyzed the NPD moving from the traditional approach, considering the NPD as a planning process of strategic and organizational aspects, to a cognitive approach which interprets NPD as a process based on learning and strategic knowledge management (e.g. Söderquist, 2006; Shani *et al.*, 2006). The cognitive approach is rooted in the wider knowledge-based conceptualisation of innovation process, which considers innovation as aware and intentional development of a learning process and utilization of the created knowledge for an effective and efficient product development (Kline and Rosemberg, 1986).

Consistently with this approach, several scholars have described the NPD as a knowledge intensive process (e.g. Clark and Fujimoto, 1991; Davenport and Pruzak, 1998; Leonard-Barton, 1995; Nonaka and Takeuchi, 1995; Verona, 1999), outlining the central role of knowledge assets and its management for the process effectiveness.

Moreover a huge amount of studies focusing on the role of specific knowledge assets in the NPD process, such as, for example, company's relationships (see e.g. Ding and Peters, 2000), intellectual property (see e.g. Kalanje, 2005), ICT solutions (see e.g. Corso and Paolucci, 2001; Khodawandi, 2005), routine and practices (see e.g. Akgüna *et al.*, 2007), has been carried out.

In addition, some recent managerial approaches like Concurrent Engineering and Multi Project Management take into account the importance of knowledge for NPD process. For example, in the Concurrent Engineering the attention is focused on knowledge socialization within interfunctional teams (Iansiti, 1995). In the Multi Project Management the focus is on the capability to stimulate knowledge sharing by a re-exploitation of project solutions over the time and on knowledge transferring among different projects (Clark and Fujimoto, 1991; Wheelwright and Clark, 1992).

In summary, NPD process can be interpreted as a process which simultaneously exploits and creates several knowledge assets, belonging to intangible assets categories above described, i.e. human capital, structural capital, and relational capital.

In order to understand how these assets are exploited and generated throughout the process, we can refer to the resource-based description of the R&D process, provided by Pike *et al.* (2005), properly tailored. Similarly to R&D process, the NPD process starts with an issue that is discovered or acquired. This corresponds either with the definition of a targeted improvement of an existing product or with the development of new one. Then possible solutions to the issue are identified. Subsequently, the most suitable solution is selected and implemented by carrying out product design, prototype and then the new product. Finally, the outcome of the new solutions implementation is evaluated, defining the information base for a new cycle of problem definition and problem solution.

During the different stages of the NPD process a number of knowledge assets are involved. In fact, the generation of new solutions requires cognitive abilities, which are mainly grounded on human capital. Any solution is then tested and codified forming elements of structural capital. Finally the evaluation of the generated solutions involves customers and other company's stakeholders, creating new elements of knowledge assets mainly in the form of relational capital. More generally, each stage of the NPD process can involve several and heterogeneous assets. For example the generation of new solution can involve customers and inter-firm's relationships, or the use of dedicated software and hardware infrastructure, and so on.

Therefore NPD process development involves human, structural and relational assets.

They interplay each other during the different phases of the process, contributing to determine process performances.

3. Inquiring into the links between knowledge assets and NPD performance

3.1 2.1 The inquiry approach: An AR project

In order to gather empirical evidences regarding the role of knowledge assets in the NPD process performance improvement and to derive insights for analysing the relationships between knowledge assets and organisational performances, we carried out an AR project within the R&D department of a big company. The project has been aimed to design and implement some knowledge assets management initiatives within the company involved in the project, with a twofold aim:

- To inquiry the following research question: "How does knowledge assets development support NPD process performance improvement?"

- To improve the company's NPD process performance by levering on knowledge assets development.

AR is a qualitative research method in which a researcher participates in organization's activities and examines an ongoing situation. It always involves two main goals: to solve a problem and to contribute to science (Coughlan and Coughlan, 2002). In particular, AR simultaneously assists in practical problem-solving and expands scientific knowledge, as well as enhances the competencies of the respective actors, i.e. researchers and practitioners, being performed collaboratively in an immediate situation using data feedback in a cyclical process aiming at an increased understanding of a given situation (Hult and Lennung, 1980).

In the last decades, AR has become increasingly prominent among management researchers for carrying out research into management and organizations. This is because this method is particularly appropriate for developing theoretical insights that relate closely to practice and concern process of managing (Eden and Huxham, 1996).

The use of the AR methodology seemed well-suited to the needs of this study for several reasons.

First, the management literature stresses that knowledge assets and their management are strongly hydiosincratic and affected by the context, thus any research investigating the subject has to take into account the organisational context. This is a fundamental characteristic of the AR which uses an organisation as a physical laboratory for developing and testing practical interventions and advancing knowledge closely related to the context.

Second, the AR, as "research in action" (Coughlan and Coughlan, 2002), well deals with the outstanding need of improving the understanding about how knowledge assets and their management affect NPD, since AR allows to extract from practice, in accordance with an inductive approach, insights to be combined with those based on a theoretical deductive approach.

Third, AR, as a comprehensive research approach, captures fully the richness of the variables involved in knowledge assets management in practice and provides an appropriate context for the interpretation of findings resulting from the other forms of investigation (Petty and Guthrie, 2000).

Finally AR is a useful approach to overcome the reluctances, prejudices and resistances that sometimes the implementation of projects concerning the management of intangibles involves (e.g. sharing individual knowledge). In fact, the participative approach characterising the AR allows to create a broad consensus within an organisation on the development and implementation of initiatives directed to manage knowledge assets.

The AR develops around a spiral cycle and includes several phases. The cycle starts from the definition of a general idea or the identification of a problem at both theoretical and practical level. This can involve researchers and concerns also the negotiation of terms of entry and of the AR program. Basically the AR includes four phases (e.g. Kemmis and McTaggart, 1988) (see Figure 1). These phases recur cyclically.
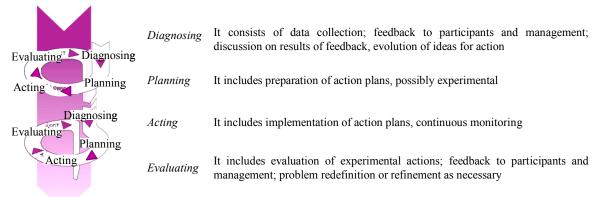

Diagnosing	It consists of data collection; feedback to participants and management; discussion on results of feedback, evolution of ideas for action
Planning	It includes preparation of action plans, possibly experimental
Acting	It includes implementation of action plans, continuous monitoring
Evaluating	It includes evaluation of experimental actions; feedback to participants and management; problem redefinition or refinement as necessary

Figure 1: The basic phases of an Action Research

The phases described in Figure 1 define an "ideal type" of AR. In fact, as underlined by Wilson (2000), AR projects may vary in the emphasis given to one phase or another, in the extent to which the actions are viewed as experimental or permanent changes, and in the degree of involvement of the client organization's managerial or other staff.

Different types of AR can be adopted. Grundy (1982) provides a useful taxonomy of AR projects which distinguishes among technical, practical and emancipatory AR.

According to this taxonomy, we have implemented a technical/practical AR project. It is technical, since it started with a specific research question well grounded on theoretical management literature background. In particular the following main points have been investigated during the research project: *how to identify and map the knowledge assets to be managed in order to improve NPD process performance?; how to choose and design the knowledge assets management initiatives?*; and *how to evaluate the performance improvement gained by the implementation of management initiatives?*

The AR project is also practical since the research phases have been carried out by creating a close cooperation between managers and researchers, looking for approaches, tools and managerial insights aimed to improve organisational performances and, particularly, the NPD process performances.

3.2 The context of the research

The research laboratory for the AR project was the R&D department of a world leader company in sofa production located within an industrial district in South Italy. In particular, we have focused our

attention on the NPD process. The NPD represents for the investigated company one of its most important business processes. The company's competitive advantage acquisition and maintenance significantly depends on this process. This is because, today, the competitiveness in sofa industry is strongly related to company' s ability to create a wide range of products with a high number of stylistic and functional characteristics[1], to frequently renovate the product portfolio and to improve efficiency by controlling production costs, standardising products' components as well as by adopting new materials. In such a competitive context, having superior performance in NPD process represents a strategic lever for facing the growing competition.

The company's NPD process is a not formalized process and greatly based upon know-how and knowledge with tacit nature, creative intuition and craftsmanlike ability of some key individuals operating in different phases of the process.

In particular, any new product, i.e. a new sofa model, is the output of a knowledge intensive process based on the know-how of some key individuals, the designers and the prototypists which, on the basis of their craftsman skills and tacit know-how, respectively design and prototype the different parts of a new sofa, providing to the product specific stylistic and functional characteristics.

3.3 The AR project

The AR project has been developed in four main phases: diagnosing, planning, acting and evaluating. Since in AR the researcher is an actor and hence subjectivity is central to the process of action and evaluation, in order to mitigate subjectivity within this research, the researchers paid particular attention to:

- Co-design and develop the AR phases together with the managers of the R&D department and the top management;
- Have a team of three action researchers, to reduce personal bias in onsite work and research;
- Have company check the write-ups;
- Seek for multiple viewpoints within the department.

In the following a brief description of the AR phases is provided.

Diagnosing phase. In this phase, first researchers and company's managers have identified some relevant problems affecting the NPD performances.

For this reason some focus groups involving the company's top management were performed.

The aim of these focus groups was understanding the most important NPD performances to be improved and identifying the factors determining under performances. In this phase, the links between general company's strategy and NPD performance improvements were analysed.

Two main performance dimensions affecting the NPD process efficiency and needing to be improved were identified: the product design activities and prototyping time and the conformity of the prototype to the standards of the designed product.

Therefore the reduction of product design and prototyping time and the improvement of the conformity have been targeted as performance objectives to be achieved.

In order to identify the specific NPD operational problems, related to the targeted performances, several data and information were collected by means of focus groups, structured and unstructured interviews, direct observations and document analysis. Both managers and employees working in the NPD process were involved. Four main problems affecting the NPD process performance were identified: i) poor knowledge sharing between prototypists and designers and lack of an effective knowledge interface between the design area and the prototype area; ii) low level of designers' know-how about the technical and structural features of a sofa; iii) lack of codified rules and procedures to drive both designers and prototypists in their activities; iv) lack of ICT tools to support

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[1] The investigated leader company has a product portfolio with an average of 90 different products and each product is basically available in 12 versions and in 100 different types of leather and textile covering. Furthemore, the average market life cycle of a sofa is 9 months.

information/knowledge storage, processing and managing. The results of the diagnosis phase were then adopted as inputs for the planning phase.

Planning phase. Once clarified the performance objectives to achieve and diagnosed the problems causing underperformance, researchers and managers have worked together during targeted focus groups in order to plan some managerial initiatives aimed to the achievement of targeted performance objectives by leveraging and developing knowledge assets.

At this stage of the research has emerged the lack of structured approaches to drive managers towards the identification of the strategic knowledge assets to lever on for achieving company's key performance targets. Answering to this lack was a critical part of the research project.

As underlined by some scholars (Kaplan and Norton, 2000; 2004; Zack, 1999) any knowledge assets management initiative has to be aligned to business strategy; as a result it has to be planned and implemented with a view to achieve organisational performance objectives.

This encompasses three main elements: i) the identification of measures and indicators for evaluating the effects of management initiatives; ii) the identification of the key knowledge assets to be developed against performance objectives; iii) the understanding of the links of knowledge assets with the performance improvement targets.

Regarding the measures and indicators for assessing the effects of management initiatives, two main key performance indicators have been defined to assess the NPD performance improvement: (1) design/prototype time for a new sofa model; (2) level of conformity, measured on the basis of an appropriate list of features, of the prototype with the drawing of the designed product.

About the identification of knowledge assets at the basis of NPD performance improvement, a set of approaches and tools have been developed and applied.

First, a disclosure of the relevant knowledge assets involved in NPD process has been carried out. The managers of the R&D department together with designers and prototypists, supported by researchers, have identified and analysed the knowledge assets involved in the process, according to the taxonomy which classifies knowledge assets in human capital, structural capital and relational capital.

Especially a tool, called "matrix of direct dependencies", was formulated and applied to facilitate the team working. In this matrix, knowledge assets are listed in rows and the targeted performance objectives are listed in columns. The cells of the matrix contain managers' judgment concerning the importance of the knowledge asset on the row for achieving the performance objective on the column. Judgments are expressed recurring to a binomial approach, i.e. yes or not (see Figure 2).

Performance Objective / Knowledge Asset	Performance Objective 1	Performance Objective 2	......	Performance Objective n
Knowledge Asset 1	Y	N	......	Y
Knowledge Asset 2	N	Y	......	N
......	......	......	......	......
Knowledge Asset n	Y	Y	......	N

Figure 2: A generic matrix of direct dependencies

By using the matrix, the following knowledge assets have been identified as relevant for the improvement of the NPD process performance: i) technical expertise of the designers; ii) problem solving capability of the designers as well as of the prototypists; iii) ICT infrastructure and particularly knowledge-based design software; iv) team-working culture; v) codified knowledge in the form of procedures, rules and best practices.

Once identified the relevant knowledge assets against performance objectives, a more detailed analysis of their involvement in NPD process has been carried out. The analysis has provided more insights for designing proper knowledge assets management initiatives. Especially it allowed to

identify the most important knowledge assets to leverage and develop for achieving performance improvement.

For doing the analysis the strategy mapping concept has been considered (see Strategy Map (Kaplan and Norton, 2000; 2004); Success Map (Neely et al., 2002)).

In particular managers with researchers' support have developed a visual framework made up by nodes and arrows providing a representation of the cause-and-effects relationships linking knowledge assets to performance objectives.
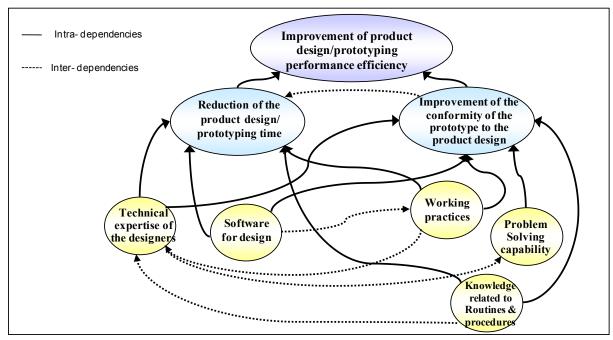

Figure 3: Relationships linking knowledge assets to performance objectives

On the basis of an in depth analysis of the relationships visualised in the map, managers have identified the following key knowledge assets for the NPD process performance improvement: i) working practices in terms of team-working, ii) codified knowledge about the product design and prototyping with particular attention to the routines and procedures, and iii) software to support the design process.

Subsequently, the attention has been focused on the analysis of the management processes to be implemented in order to develop the identified key knowledge assets.

In this regard, the Knowledge Management literature provides a vast number of approaches, recommendations and insights (e.g. Holsapple and Joshi, 2000; 2002; Lev, 2001; Marr and Schiuma, 2001; Teece, 2000) for performing management processes.

The researchers have supported managers in choosing the most suitable management processes against key knowledge assets and their interactions shown in the map.

Two main knowledge management processes have been identified as relevant: the knowledge sharing and the knowledge codification process. Therefore, on the basis of the chosen management processes, two main knowledge assets management initiatives have been designed.

One initiative has been planned with the aim to create a knowledge interface infrastructure to facilitate the development of a team-working approach between designers and prototypists. While, the other one has been addressed to build knowledge repositories where to collect and manage codified rules and procedures of the NPD process.

Acting phase. In this phase the designed knowledge management initiatives have been implemented. The first initiative, aimed to create a knowledge interface for team working, has been translated into

action by the definition of new design standards based on the introduction of specific sofa-designed drawing and on a 3D virtual representation of a sofa and its components.

At present, once the designers have completed the design process they draw a detailed picture of the external stylistic characteristics of the sofa. Afterwards, the drawing is analysed by a team of designers and prototypists and, finally, it is elaborated by 3D software, which provides virtual representations of the sofa and its components. In addition, a platform of cognitive artefacts has been created. The platform allows designers and prototypists to work together breaking down the silos in which they used to operate. In this way, it is possible a prompt feedback about problems of the designed sofa and the knowledge sharing mechanisms between designers and prototypists are facilitated.

The second initiative, aimed to codify the tacit knowledge at the basis of the NPD process, has been carried out by developing a design sofa manual. Capturing and codifying tacit knowledge in a way that can be leveraged by the company was a great challenge.

For this purpose several tools have been used: workshop, interviews, analysis of documents. audio and video recording, field notes, collection and analysis of anecdotes.

Today, the company is updating continuously its own manual which collects and makes easily available codified rules and procedures on the design and prototype solutions. Moreover, it codifies knowledge about the features of company's product portfolio.

This is proving to be particularly useful for the identification of the best practices and solutions which support continuous improvement as well as for stimulating learning organisation mechanisms by moving the knowledge from individual to groups and from groups to the entire organisation.

Evaluating phase. In this phase the outcomes of the initiatives have been assessed. This has been carried out by gathering information from managers, designers and prototypists through structured and unstructured interviews as well as by collecting and analysing measures about the NPD process performances from the quality assurance department.

The implementation of the management initiatives have proved to generate value for the company mainly in terms of both the reduction of the time to develop a new model of sofa, in particular the average time has been today reduced of 30%, and the improvement of the stylistic/functional conformity of the prototype to the product design, which guarantees a better alignment with customers' requirements.

4. Discussion

The analysis of the results of the AR project suggests some fundamental insights regarding the management of knowledge assets aimed to improve organisational performance.

In particular, the distillation of the empirical evidences shows that the design, implementation and evaluation of management initiatives aimed to sustain company's performance improvements by leveraging and developing knowledge assets can be articulated through four main cycle phases: *Value Strategy Clarification*, *Knowledge Asset Disclosure*, *Knowledge Assets Management Initiative Definition* and *Performance Improvement Assessment*.

Value Strategy Clarification: this phase is aimed to answer to the fundamental question: '*What are the key strategic company's performance improvements objectives to be achieved?*' Before starting a management initiative for knowledge assets development it is fundamental to clarify the company's strategy. This equals to define the company's value propositions and the key company's strategic objectives related to the company's value creation strategy. Once the company's strategic value objects have been identified, these have to be translated into company's business performance and performance targets. Moreover performance measures need to be defined in order to monitor the achievement of the performance improvements targets. For this purpose the adoption of Performance Management and Measurement Systems is particularly useful for clarifying, communicating and assessing strategy. Once the company's strategic objectives have been disclosed, the attention has to be focused on business processes involved in the achievement of those company's strategic objectives and on the knowledge assets at basis of the processes.

Knowledge Asset Disclosure: this phase is aimed to identify and analyse knowledge assets which are relevant for achieving the targeted performances. At this stage the following question has to be addressed: '*What are the key knowledge assets at the basis of organisational performance improvement?*' The identification and the analysis of key knowledge assets value drivers necessarily involves managers in discussion and decision making process. The use of tools such as the "matrix of direct dependencies" and the strategy map can support the disclosure.

Knowledge Assets Management Initiative Definition: this phase is aimed at designing the knowledge management initiatives for the development of key knowledge assets. At this stage the following question has to be addressed: '*What are the organisation knowledge management initiatives to be designed and implemented for knowledge assets development?*' The principles of Knowledge Management can properly drive the design and the implementation of initiatives. Particular attention has to be paid to the organisational, managerial and cultural factors affecting the success of knowledge management initiatives, e.g. commitment and managerial support, motivation in people, unambiguous communication of the aims pursued by the initiatives.

In the research project one of the most important factors affecting the successfully implementation of management initiatives was the top management support.

Performance Improvement Assessment: this phase is aimed to evaluate the impact of knowledge management initiatives on organisational performance. It is addressed the question: '*What are the benefits gathered from the knowledge assets management initiatives?*' In particular, two aspects need to be investigated: the development of the key knowledge assets and the improvement of organisational performance involved. Monitoring and measuring the impact of the development of knowledge assets on performance is very important to get the approval and commitment of the entire organisation. For this reason, it is very important to have in place measurement systems which account the impact and benefits of the development of knowledge assets – the measurement makes tangible the benefits and justifies the investments. In particular, managers on the basis of performance measures can justify their investments into certain key knowledge assets value drivers, or, if their assumptions were wrong and there was not a performance improvement, they might go back to the start and understand the reasons of the failures both from strategic and operative point of view.

5. Final remarks

In the last decades, the economic and management literature has largely stressed the importance of knowledge assets for a company's competitiveness. Grounded on the KBV and the RBV, this paper stresses the importance of better understanding how knowledge assets can be identified and developed to drive organisational performances improvement. The links between knowledge assets and organisational performances have been investigated by implementing an AR project within the R&D department of a leader company operating in sofa production. The project has highlighted the fact that despite managers recognising the strategic role of knowledge assets for company's performance, they need guidelines and approaches for the identification, analysis and deployment of these assets.

Although this paper contributes empirical evidences about the importance of knowledge assets and their management for company's competitiveness some shortcomings have to be stressed.

First, even if the NPD might represent a strategic process for company's performance, it would be helpful to extend the investigation to other organisational processes, separately and/or jointly, in order to have a more holistic view of the interactions between knowledge assets and a company's value creation mechanisms.

Moreover, to generalise the research's results, several applications in different industries and the use of different research methodologies are required.

Future developments of the research could concern the analysis of the managerial factors affecting a successful implementation of knowledge management initiatives and how these factors can be governed in order to get the highest positive value impact on company's growth. Finally, great attention should be paid to the exploration of the dynamic evolution of knowledge assets and their impact on a company's value creation dynamics.

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