POLITECNICO DI MILANO

HOW DESIGN CAN BOOST COMPETITIVE PERFORMANCES IN SMEs

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Introduzione

Questa introduzione all'elaborato in lingua da noi redatto vuole essere un estratto sintetico dei concetti ivi espressi e delle tesi perseguite. La natura breve e riassuntiva di questa introduzione non può essere esaustiva della complessità dell'elaborato e delle sue specificità, ma piuttosto mira a fornire un quadro generale di azione entro cui ci siamo mossi per verificare le ipotesi che vi stanno alla base.

Nel panorama accademico ed imprenditoriale oggigiorno viene percepita con sempre maggior intensità la rilevanza del design e delle pratiche di design. Numerosi studiosi e ricercatori hanno analizzato come il design sia un asset fondamentale a disposizione di imprese e imprenditori e come la sua rilevanza, cresciuta significativamente insieme ad un grado di consapevolezza sulla materia, sia data dal ruolo che questo svolge nell'essere un differenziale competitivo nel lungo periodo.
Oggi la grande differenza tra chi vive e prospera nel mercato e chi viene costretto ad uscirne è data infatti dalla capacità di innovare. La capacità di essere dinamici, adattabili e reattivi ai cambiamenti di un mercato che è sempre più rapido nei suoi mutamenti e che presenta cicli di vita (sia di prodotti che di aziende) sempre più ridotti, è diventata elemento centrale e discriminante tra il successo e il fallimento. Vince chi innova ed è malleabile al cambiamento, perde chi non sa ripensare se stesso ed il proprio business. Questo ragionamento è ancor più vero nelle piccole e medie imprese esposte oggi in un contesto in continuo cambiamento. In questo quadro di accresciuta consapevolezza verso il design e le sue potenzialità, viste non più come componente estetica ma come sistema di pratiche, il nostro elaborato prende le mosse e si concentra sulle relazioni potenziali tra investimenti in design, innovazione e performance aziendali.
L'elaborato si apre con un'analisi critica della letteratura prodotta a livello accademico sul tema del design, nella sua particolare accezione di strumento (tool) abilitatore di innovazione. Molti ricercatori hanno portato evidenze empiriche oltre che costruzioni teoriche, che illustrano come il design e più nello specifico gli investimenti in design impattino in maniera positiva sulla capacità innovativa delle imprese. Le direttrici principali su cui si sono sviluppati negli anni i contributi alla comprensione del design e del suo impatto sulle performances aziendali, hanno riscontrato due barriere principali: una

mancanza di linguaggio comune sul design, e la poca significatività dei risultati ottenuti nell'identificare quali fattori legati agli investimenti in design fossero centrali nel miglioramento dei risultati delle imprese.

In questo elaborato, prendendo spunto dal progetto DeEP in cui siamo stati coinvolti, abbiamo analizzato e chiarito quali fattori leghino nello specifico l'incremento delle performance aziendali e gli investimenti in design, cercando di evidenziarne il funzionamento all'interno dei processi e del "way of thinking" delle piccole o medie aziende.

Lo studio si basa su un insieme di analisi di dati qualitative e quantitative ed interviste con imprese, legislatori e intermediari o facilitatori, che ha come elemento centrale la valutazione degli investimenti in design nelle piccole e medie imprese in Italia, Svezia, Inghilterra e Polonia, attraverso l'analisi di quattro politiche sul design. Lo studio si concentra sulle imprese beneficiarie della politica italiana 'Un designer per le imprese' ed unisce all'analisi delle interviste svolte da noi in prima persona, i risultati aggregati delle analisi svolte dai partner europei nel progetto DeEP sopracitato. Questo scambio di informazioni ci ha permesso di confrontare i nostri risultati ottenuti a livello italiano con i corrispettivi ottenuti a livello europeo, svolgendo così un'analisi incrociata nell'interpretazione e nell'evidenza empirica dei risultati ottenuti.

L'elaborato si chiude con la parte di valutazione dei risultati empirici, dove viene proposta una interpretazione alle due ipotesi che sono state alla base dello studio. Ci siamo innanzitutto chiesti l'esistenza e la natura del legame tra investimenti in design ed innovazione per le imprese analizzate, in modo da provare empiricamente quella che è stata un'ipotesi argomento di discussione nel mondo accademico. Le evidenze empiriche e le recenti elaborazioni accademiche sul tema mostrano un chiaro rapporto tra investimenti in design e risultati innovativi per le imprese che hanno sostenuto questi investimenti.

Alla base della seconda ipotesi vi è l'impatto che gli investimenti in design hanno sulle performance aziendali in termini di vantaggio competitivo sostenibile nel tempo, attraverso l'azione e il miglioramento di determinate *Design Capabilities* presenti nelle imprese. Anche in questo caso le evidenze empiriche hanno mostrato come investimenti in design con finalità o aspetti differenti, stimolino "capacità" aziendali distinte ed inquadrabili in 5 *Design Capabilities* quali: 1.*Holistic view* (la capacità dell'impresa di gestire il design come un processo unico e fortemente legato con la strategia d'impresa e la pianificazione

di medio-lungo periodo); 2.*How people give meaning to things* (l'abilità di percepire e saper interpretare il processo di attribuzione di significato dei consumatori esterni all'azienda ed in particolare ai suoi prodotti); 3.*Applying new technology* (la capacità dell'azienda di implementare processi, strumenti, macchinari e tecnologie per migliorare la gestione o l'integrazione del sistema); 4. *Visualizing and Materializing* (la capacità dell'impresa di concettualizzare e dare una concretezza fisica alle idee prodotte); 5.*Managing the Design process* (l'abilità di gestire in maniera efficace ed efficiente il processo di design inteso come insieme di attività interconnesse e complesse).

Con questa introduzione abbiamo fornito una panoramica della nostra azione nel redigere la tesi, ma una sua comprensione approfondita e puntuale può avvenire solo proseguendo la lettura ed entrando nell'elaborato vero e proprio che segue, e a cui vi lasciamo.

Abstract

Design, nowadays, is perceived as a strategic asset in a dynamic and competitive environment under a business and an academic point of view. An increasing number of scholars, researchers and executives investigated this topic trying to identify the links existing among design, innovation and competitive performances.

Recent papers and studies have specifically targeted the impact of design practices and design management on firms' performances, proving a relationship between investment in design and the consequent increase in performances.

Our study investigates the relationship between design investments or design resources and firms' competitive performances, and aims to map those companies' capabilities that, stimulated by investments, can affect firms' competitive performance.

The study we have conducted is based on several interviews with firms, policy makers and intermediate subjects. These interviews investigate the results obtained by firm's participation to a *Design Policy*, perceived or shown by companies themselves.

The empirical results of the study, both quantitative and qualitative, showed that investments in design positively impact on several capabilities the firms have. Those capabilities have been named: 1. Holistic view (the capability of a firm to manage design as a whole process deeply linked to the firm's strategy and the medium-long period planning), 2. How people give meaning to things (the ability to understand the perception process of customers and people outside the company), 3.Applying new technologies (the ability of a firm to integrate and implement new methods, machines, tools or skills to better manage the company's process or in general the set of activities the firm does), 4. Visualizing and materializing (the ability of an enterprise to conceptualize and actually give physical substance to ideas), 5.Managing the Design process (the ability to successfully lead and manage the process that is mean as a bundle of activities the company follows from the product concept or idea to the commercialization of it).

The increasing in those capabilities due to design investments, influences firm's processes, procedures and planning on firm's competitive performances and provide a sustainable competitive advantage in the business environment. The "magnitude" of the impact is mediated by design management practices and by external factors, but is also due to the mix of improvements in design capabilities generated by hard or soft investments in design.

Executive Summary

This study aims to analyse and to highlight the role of design within companies as a competitive advantage tool that could boost SME's performances in a sustainable way, on a medium-long period. This executive summary provides a general overview on our study and it shows evidence of the main results that emerged using: data, interviews and analyses on previous studies.

After fully understanding how the concept on design evolves; we can affirm that design is increasingly being recognized as a fundamental ingredient in business innovation, thanks to its ability in shaping ideas and translating them into practical and appealing propositions for users. The implementation of design tools and practices in strategic activities has become a source of competitive advantage nowadays. Consequently, design and creative industries in general are recognised as one of the essential competitive factors to improve companies' performances.

The design thinking approach is recognised as a driver of non-technological innovation that exists when design focuses on becoming a strategic innovation activity that takes in consideration all aspects of innovation: human values, technological possibilities and business models.

This study presents the results we have obtained in the analysis made on the existent relationship between design investments and firms' competitive performances improvements. While many scholars and researchers demonstrated the existence of a positive link between design and performances, a few of them proved that this relationship is due to the impact of investments on classes of capabilities.

Our research started in October 2012 and was carried out within the Department of Management Engineering (DIG) of Politecnico di Milano through the participation in the **DeEP project,** Design in European Policy. The development of the project have involved different partners, including Politecnico di Milano, through the study and analysis at a national level of DIPI (Design Innovation Policy Initiatives) for each participating country. The Politecnico di Milano has chosen to evaluate as a target-policy the initiative promoted in the Milan area by the Chamber of Commerce known as 'Un designer per le imprese'.

Nowadays, design is not recognized anymore as a mere styling resource but it is considered as a strategic tool for the firms' differential competitive in a long term period. Despite the lack of common language and a unifying theory, several scholars of management and innovation have attempted to quantify the contribution of design to the bottom lines, providing interesting results and suggestions (Gemser G. and Leenders M. 2001; Borja de Mozota B. 2003; Boland RJ and Collopy F 2004; Creusen MEH and Schoormans JPL 2005; Hertenstein et al. 2005; Veryzer 2005).

'Design can be regarded as a bundle of resources in organizations. Company resources can be physical, such as plants or equipment, but they can also be intangible such as the human resources available to firms' (Acklin C. 2013). 'These resources are valuable, rare, imperfectly imitable and non-substitutable, that creates a competitive advantage for a company' (Barney J. 1991).

Now that we solved the issue of defining design, we can briefly analyse the academic literature produced on the relationship between design investments, innovation and firms' performances improvement. The academic discussion about the topic can be presented accordingly to the study of Dell'Era C., Altuna N. and Verganti R. (2013) that organize the entire production of researches on this topic in two different streams. The first stream analyses the impact of *design innovation performance* and *design management practices* on *competitive performance*, whereas the second investigates the impact of *investment in design* and *design management practices* on *competitive performance.*

The first research stream investigates the relationship between innovations based on design and competitive performances. Several scholars estimate the capability to launch on the market design-driven innovations by considering the number of design awards or by asking design professionals to rate skills and achievements shown by companies. Firms characterized by a successful use of design, consistently outperform their competitors on a wide variety of financial indicators (Roy R., 1994; Swan KS.et al., 2005; Bedford et al., 2006; Gemser G. et al., 2011) and even in overall stock performance (Hertenstein et al., 2001; Rich, 2004). Good design practices appear to have long term, persistent and stable effects over years (Roy R., 1994; Hertenstein et al., 2005). Whereas the technical newness effects on sales has been shown to decrease as the product reaches its maturity, contrary

design is a significant driver of sales over the entire product life-cycle (Talke K. et al., 2009).

The second research stream investigates the relationship between competitive performances and investments in design, with the aim of identifying some sort of Return of Investments (ROI) for design (Wallace R., 2001; Zec and Jacob, 2010). Companies with higher budgets generally show better financial positions than their competitors (Gemser G. and Leenders M., 2001; Swedish Industrial Design Foundation, 2004; Candi, 2010). However, the results derived from an investment in design are significantly influenced by the managerial practices adopted by the company (Danish Design Centre, 2003; Chiva R. and Alegre J. 2009).
Some authors note that financial indicators alone cannot capture the full value of design; the impact of design on company's performances is various and mediated by other factors, making it difficult to measure just analysing financial data (Borja de Mozota B., 2006; Gabrielsen et al., 2007). Indeed, the effects of design can be tangible when they generate direct financial returns tothe business but may also be intangible when they contribute to the future performance of the company by affecting non-quantifiable factors such as the cultural and strategic assets of a company (Inns T., 2002).

As presented in these studies, it seems very likely that the impact of design on companies' performances will vary depending on specific skills and characteristics of the firm. These skills are recognized by the name of **design capabilities**.
In past research, design management scholars have identified different design capabilities in organizations, some derive them from product development processes (Perks, Cooper & Jones 2005) or from the design management used in design oriented companies (Borja de Mozota B. 2006), others detect a connection between an in-house design team and the design management skills of companies (Chiva R. and Alegre J. 2009).
Important to mention is the study on *dynamic capabilities* defined by Teece and Pisano. They refer to resources as 'firm-specific assets that are difficult if not impossible to imitate. Such assets are difficult to transfer among firms because of transactions and transfer costs, and because the assets may contain tacit knowledge' (Teece and Pisano 1994).

Taking as a starting point Teece and Pisano studies, in this thesis project we have hypothesized the existence of five design capabilities. We believe that business performances are due to the mix of these specific capabilities. We also hypothesized that an improvement in design capabilities results in a boost in the firms' performances and have an impact on the competitiveness of the company.

1. *Holistic view*: The ability of a firm to manage design as a whole process deeply linked to the firm's strategy and the medium-long period planning;
2. *How people give meaning to things*: The ability to understand the perception process of customers and people outside the company. This capability gives to the firm a design-driven view (Verganti R., 2007) to better understand how users give meanings to products or objects they use or they meet for the first time;
3. *Applying new technologies*: The ability to integrate and to implement new methods, machines, tools or skills to better manage the company's process or in general the set of activities the firm does;
4. *Visualizing and Materializing*: The ability of an enterprise to conceptualize and actually give physical substance to ideas;
5. *Managing the Design process*: The ability of considering management in a design-based view.

To understand how this research has been structured we will illustrate the process adopted in order to manage our field of research. Here we aim to present the methodology we used in this study and the comparison we made between different European policies in order to investigate the subject.

The main goal of the project in which we have collaborated, was to evaluate the effectiveness of the investments in design seen as the participation in design policy and the performances improvement of the participant, allowing policy makers to develop strategically new design innovation policies across Europe. It was necessary to evaluate the policies from two points of view:

1. First related to the public bodies (such as Policy makers, Governmental Institutions, Business Support Organizations, Employers' Federations, Public Business Support

organisations, Design Promotion Bodies) which are mainly interested in evaluating design innovation policies and in disseminating the positive impact of design innovation in business processes.

2. On the other hand, related to the beneficiaries firms', partecipants in design innovation policies will benefit from a closer understanding of the impact of such policies on their processes.

The focus of our study has been put on firms and specifically on the impact that design investments have on companies' performances. In order to pursue our goal and to gather the necessary data for our research we proceeded to prepare a questionnaire targeted on policy makers and one targeted on firms aimed at addressing the concept of design and its perception.

We interviewed first the policy makers with the aim to understand the policy process and to be aware of the objectives they pursued by providing the programme and then we proceeded with the firms' interviews, which were the central part of our analysis. We tried to understand if the target companies have obtained or not some positive impacts investing in design practices through the participation in the policy and how we could interpret and measure those improvements.

During the research we produced eight case reports, some of which are attached in the annex section, and we studied the results that the investments in design produced in terms of impacts at firm level (micro level). During the study, we interacted with others universities' partners of the project, so it was possible to carry out an exchange of information and documentation collected during the previous months in a strategic cross-country analysis of the various local initiatives. At the same time, our research has gone with the other institutions into the construction of panels of indicators at both micro and macro levels. The main role of Politecnico di Milano, and consequently our main task, was to build a system for design investments evaluation at firms' level, through the construction of a set of indicators, which will be, together with all the output produced in the research, an evaluation tool resulting from the project**.** The role of this tool is to include and transform the outputs into an useful object in support of both policy makers and beneficiaries.

After having briefly presented the project structure, we want to clarify what has been the field of research in which we moved, at the base of the linkage we supposed between investment in design and performances improving.
Our assessment tries to answer to two assumptions that we have examined in the course of the analysis, both came out from what is still not properly clear from the literature:

1. Investing in design means investing in innovation, design is the main driver in innovation competition that allows to gain a sustainable competitive advantage;

2. Design investments impacts take place through five design capabilities, those investments affect firms' performances, increasing and empowering them.

In order to answer the two question presented above, we have adopted the case studies methodology. We needed to analyse those firms that had substantially invested in design so we could prove with both an empirical and a quantitative analysis, how the investment in design had an impact on the overall companies and how the design awareness changed the process and the strategies of the firms that invested in. For this reason we asked feedback from participants of the design policies (Italy and Europe) on how the innovation process changed after the design investment. We report the beneficiaries firms and the European policies data in the tables below:

Beneficiaries Firms	**Founded**	**Country**	**Industry**	**Employees (2011)**	**Markets presence**
A4A Design	2002	Italy	Furniture design	6	Europe
Amica Wronki S.A.	1957	Poland	Electrical appliance	1800	Europe
Arcoma	1990	Sweden	Medical furniture	58	Worldwide
Asimpex	1985	Poland	Pharmacies furniture	60	Worldwide
Camp Scandinavia	1952	Sweden	Orthopaedic rehabilitation products	190	Worldwide

Challs International	1990	UK	Cleaning products	20	Worldwide
Engineering Company (anonymous)	1985	UK	Design and manufactures	20	N/A
LEONE 1947	1947	Italy	Boxing apparel	14	Worldwide
Marmorin	1985	Poland	Marble manufactures	240	Worldwide
Merli Marmi	N/A	Italy	Marble design products	5	Italy
Mode:lina	2009	Poland	Design products and accessories	5	Poland
MomoDesign	1981	Italy	Accessories and clothing	12	Europe
Naylor Industries	1890	UK	Manufacturer of building & construction products	N/A	UK
Owlstone	2004	UK	Nanotechnology	N/A	Worldwide
Perimed	1981	Sweden	Micro vascular furniture	43	Worldwide
Permobil	1967	Sweden	Electric wheelchairs	191	Worldwide
Sonnomedica	2006	Italy	Sleep Medicine furniture	6	Italy
Soul and Mind	1992	Poland	Design services	35	Poland
Tucano Urbano	1999	Italy	Bike clothing and accessories	30	Europe

Table 1 Beneficiaries firms' data

Name of the Policy	Policy typology	Country	Target Editon	Beneficiaries	Budget [K€/year]

Un designer per le imprese	Targeted to design (access capabilities)	Italy	2011	+50	120
Design som Utvecklingskraft	Targeted to design (enterprise capabilities)	Sweden	2011	+450	1.900
Designing Demand	Targeted to design (enterprise capabilities)	UK	2011	+700	1.520
Design Your Profit	Targeted to design (access capabilities)	Poland	2011	+600	5.288

Table 2 Design policies' data

Through a data elaboration of the case studies, we gathered quantitative output to state the changes in design capabilities and the improvement in performance. Related to our second assumption, we introduced the term "Absorption", which can be defined as the empowerment of the target firm's design capabilities due to partial retention of the results achieved by the investment in design. Design capabilities are those factors that affect and influence the enterprise ability in understanding and using design as a central enabler of innovation and competitive advantages. They depend on the firm's interpretation of users' needs and trends in terms of creation of new meanings and new experiences that could result in breakthrough products and services respect the mainstream paradigm and could permit to gain a sustainable competitive advantage against competitors.

Our research aims to analyse these aspects, or better, the relation between investments in design enabled through a policy participation and enterprises' capabilities improvement. We understood a better way to describe and interpret those improvement constructing indicators and models able to measure the eventual empowerment of design capabilities and the magnitude of the "Absorption" of knowledge and practices the firm was able to do.

We aim here to present the empirical results emerged during the firms' interviews and the data analyses we carried out in order to validate the two main research's hypothesis. As mentioned above we proceeded with a cross-country analysis that considers the case studies we developed within the European project in which we collaborate, and refers to them as baseline to test the hypothesis itself.

We start from the first hypothesis (HP1), which emerged during the literature review. We want to verify the assumption that for each single € invested in design activities firms will experience an impact on innovation outcomes or results. The impact that design investments have on companies' performances must be analysed not only in term of design outputs but also in term of innovation output. We know that there are overlaps between design management studies and strategic management studies when design is being considered as a strategic resource (Utterback et al., 2002). Starting from this consciousness, we can exemplify what we hypothesized namely when firms invest in design, as the case of design policy, they are investing on innovation and they must consider the outcome of both in order to investigate the improvement in firms' competitive performances.

The Swedish firms' analysis exemplifies how one can innovate through design practices and design methods to gain a competitive and sustainable advantage and how this is perceived as a side effect of investments in design and not as a direct effect. We must say that the design-innovation link and the impact that design investments have on firms' innovativeness and performances, can be clearly perceived by the answers firms provided to the questionnaire that aimed to investigate this specific impact.

Investments in design are useful because they increase the opportunity for companies to take advantage of new resources for innovation. As reported from a Swedish company: "*We did somehow develop a new approach/mind-set about how to handle things. It was something that somehow pushed and boosted our perception of innovation in the right direction*". [Johan Henningsson – RnD Manager of Arcoma].

The second point we want to discuss is how firms can take advantage of those resources and investments that is our second hypothesis: the empirical evidence of the five design capabilities we hypothesized. The design capabilities act as mediating factors and

empowered by design investments, they impact on firms' performances and boost them (HP2).

Since the focus of our study is on firms and on how design investments can impact in the increase of their capabilities, it was very helpful to be successful in measuring and verifying these results. Measuring impact means being able to evaluate support policies we see as a design investment, in order to investigate the effectiveness and the efficiency of investments and to study the increase in capabilities enterprises can achieve.

The concept of absorption and its correlation with design capabilities result even more evident if we go through the analysis. In our research we noticed that firms were aware about changes they experienced in their business, processes or in the way they developed products and innovate before the investments. In the Polish evaluation, one of the beneficiaries firms gave insight about the change of perspective we were talking about: "*The company has a constant relationship with design now. What actually changed was the way of talking to an employee and how to apply new knowledge or do the same things in new (improved) ways. [..] The new approach to design does not necessarily have to revolve around styling and designing, but I think it concerned our strategy*" [Jerzy Woźniak – founder of mode:lina].

At the end of the gathering of the answers provided by the firms we are able to make some consideration about what happened in term of design capabilities improving consequently to the support provided.

Some of the answer collected by the firms can be connected for example to design capability N.1 Holistic view, as what is reported from Paolo Merli (MerliMarmi): "*I would not say that something really changed in our process, but obviously changed the approach we have to design*"; we indeed described holistic view as the capability of a firm to manage design as a whole process deeply linked to the firm's strategy and the medium-long period planning.

We found a good revelation of leverage design knowledge like How People Give Meaning to Things (design capability N.2) reported in one of the most recurring statement granted: "*After this experience we are more aligned with our market; design helped us to visualize our strategies*".

Other evidences of improvement in design capabilities N.3 (Applying New Technologies) or even N.4 (Visualizing and Materializing) are highlighted by Veronica Masiero: "*The*

technology plays a limited role in Leone's business, but the visualization of new services and new ideas had been improved by the policy as never happened before" [Veronica Masiero - Marketing and Advertising Manager of Leone1947].

Moving forward within the analysis concerning design capability N.5 Managing the Design Process, we could link many answers to what happened in the developing new concepts after the policy, the most upsetting results were achieved by Sonnomedica. Marco Caglieris reported: "(…) *we are a service-centred enterprise, for us this way of innovating is uncommon, we usually did not pursue this path. For us was quite a step, because it changed the way we usually approach the process of definition of a new concept and this project forced us to review our internal processes and to evaluate them in term of compliance to final users.*"

Together with an increase in perceived or qualitative performances into firm's processes we could observe an increase in economic indicators for the companies that experienced the support. Those answers prove how investments impact on factor firm-specific called capabilities that could boost performances by acting on processes, activities and soft aspects of the company-system.

The hypothesis on which we have based our work is concentrated on the existence of a correlation between design investment and performances growth of firms (HP2). Following this issue, we focused on the concept of "design capabilities absorption".

For all the results obtained from the support policy mentioned above, we can say that the link between the two dimensions exists and is relevant in terms of business strategy. We can also affirm that the link is mediated by five factors called design capabilities that together with internal inputs (firms' investments) impact on companies' performances. It is also interesting to see how different policies have given different results compared to the same theme. This convinced us even more, of the goodness of the distinction of design in a set of design capabilities. We perceived the importance of this specific aspect of our research and we decided to propose an original model that aims to investigate the absorption linked to design capabilities. We called this model the "Model of Absorption":

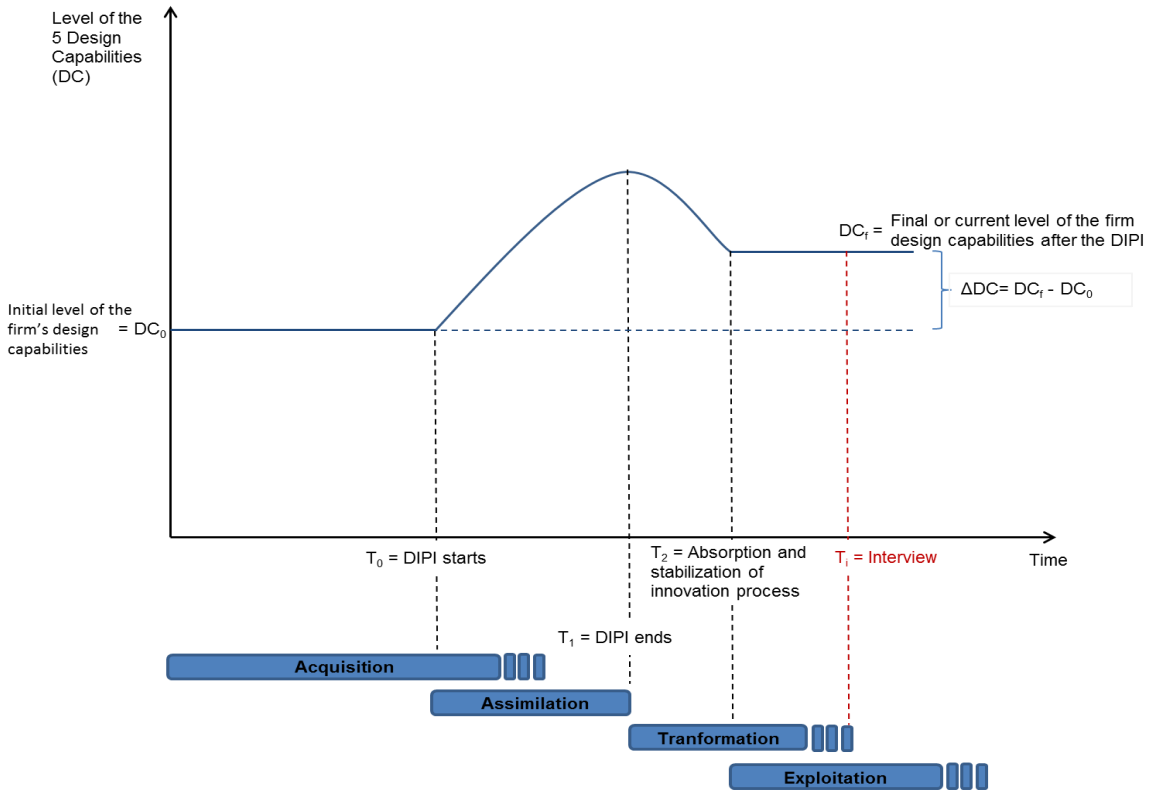

Figure 1 The Model of Absorption

The model shows how the level of design capabilities could evolve over time and highlights an increase of these skills resulting in a final ΔDC (Design Capabilities). We aim here to summarize the central considerations about it; we must underline that this retention of knowledge within the firms can be reached thanks to the support of the design management capabilities going through the stages of *acquire*, *assimilate*, *transform* and *exploit*. For better understanding, we report the definition of these four stages provided by Acklin:

1. *Acquire*: Identification of specific design contribution to company, that consists of recognizing the potential of design as a strategic resource;
2. *Assimilate*: Combination of new design knowledge to goals and processes, entails a deeper understanding of the new design knowledge by connecting it to company goals;
3. *Transform*: Deployment of design knowledge and improvement through building design management capabilities and using design tools to improve all customer

touch points such as products, brands, services, communication or processes such as NPD or innovation processes;

4. *Exploit*: Company-wide implementation of new knowledge, will involve the implementation of the design resources through integrating design into processes, co-ordinating functions, aligning core values and training the staff. It gets evident that design is not a one-time activity but needs further investments.

We want also to stress that companies with less experience, what we called *design maturity*, gain more in term of capabilities and consequently in term of performance than those companies that have experience in design. We mean that the impact on design capabilities growth on firms' performances depend by the maturity of the company itself; if a company have an higher starting level, the final ΔDC will present a lower percentage increase than a company that have no perception of design. This result allows us to take in consideration a hypothetical trend of the correlation between investments in design and firms' performances, which is not linear but decrease with the increase of design understanding and design maturity.

The process of building capabilities needs to be done partly by the company itself, by building up design management capabilities that fit its context and specific needs, and part with external designers' partners. Our expectations are to leave in companies a strategic-oriented design view, new procedures and technologies, or even the awareness that in today's global competition one lever to be used for the success of companies is design. Finally we can stress that the achievement of results from these investments, could be synthetized in the ΔDC, as a result of the increase in the five design capabilities, as our second hypothesis affirms.

According to the results achieved through the interviews and the cross-country study we have conducted, we can affirm that regarding the first hypothesis their is a relationship between design investments and innovation outcome. As we reported before, the major part of the beneficiaries interviewed experienced, thanks to the design-based investment, a process of innovation not only regarding the final products but also evident in processes, activities and practices used by the enterprises itself. Design investments enabled innovation as a primary driver; many beneficiaries highlighted that their competitiveness

was improved thanks to an increase in their innovativeness. We have proofs that investments in design impacts on firms' competitiveness and on their performances, but in order to measure and understand this impact we must consider also innovation outcomes because they deal with design and design investment.

The second hypothesis was more complicated to investigate and less understandable to the firms. We have empirically proved the existence of a relationship between design, seen as a bundle of complex activities, and the company's performances through the stimulation of five design capabilities. Our research explained how design could boost firms' performances empowering some areas and some characteristics of companies through five precise design capabilities.

We have gathered information using a questionnaire and tried to target and address the five different capabilities in order to say if they could be defined and divided from each other. We can affirm that the existence of five design capabilities acting on specific skills and knowledge has been confirmed by the research we made. A relationship of causality between the five design capabilities did not emerge by the interviews, moreover we can add that those five are so deeply linked between each other and for this reason it is difficult to depurate the impact they could have one-by-one on the firms performances. Consequently, in order to experience an increase firm's performances and to gain a sustainable competitive advantage, all the five design capabilities are necessary.

These capabilities impact on companies' performances, addressing different competencies and characteristics of the enterprise. As those capabilities are stimulated by investments in design, they grow and can be absorbed by the firm. We have identified the impact on firms' performances and the earning of competitive advantage through investments enabling the empowering of those capabilities and their retention named 'Absorption'.

The research we made and the model proposed was built on an original concept developed in collaboration with Politecnico di Milano, Department of Management Engineering, and it evidences the relationship between stimulation of design capabilities through investments in design and their retention on firms straight linked to companies' performances in the competitive market.

Another consideration on the absorption concept came out by the answers collected through the firms interviews; the increase in design capabilities and consequently in performances is greater for firms that have little or no experience in design compared to

firms that deal with design in their daily business. This shows how the incremental benefit of design investments is greater if the design capabilities are less developed.

1. Introduction

In the following document, we try to clarify a topic that is widely discussed, through the investigation of a subject that is nowadays central for firms and researchers. We want to examine the role of design within companies as a competitive advantage tool that could boost SME's performances in a sustainable way on the medium-long period.
It is fully known how is evolving the conception about design, it is increasingly being recognized as a fundamental ingredient in business innovation through its ability to shape ideas and translate them into practical and appealing propositions for users. Consequently, design and the creative industries in general, are recognised as one of the essential competitive factors to improve companies' performance (Green Book on Creative Industries, European Union, 2010). Innovation processes design is currently focusing on becoming a strategic innovation activity that considers all aspects of innovation: human values, technological possibilities and business models. This represents a design thinking approach that is recognised as a driver of non-technological innovation (Design as a driver of user-centred innovation, European Union, 2008).

Our research starts due to a collaboration with the Department of Management Engineering (DIG) of Politecnico di Milano through the participation in the DeEP project, in which we investigated the impact of design and its investments within SME's and particularly focusing our attention on the performances' improvement that can be reached when they invest in design activities or processes.
The DeEP project, Design in European Policy, is one of the six projects founded by European Commission – Enterprise and Industry Directorate-General promoted by the European community and coordinated by the Politecnico di Milano (IT). It was realized thanks to the collaboration of various stakeholders: Lancaster University (UK), Mälardalen University (SW), Confartigianato Lombardia (IT), The Work Foundation (UK), Munktell Science Park (SW), and Pro Design Poland (PL).
The DeEP's overall goal is to create an understanding of the impact of design innovation policies by building frameworks and indicators to evaluate these actions both at a macro (regional, national, European) and micro level (firm level) (DeEP Glossary 2013). This project promotes the integration of design and user-centred innovation in innovation

policies to generate a joint understanding and vision on how non-technological innovation can impact on regional, national and European socio-economic growth.

The **key points** that have been pursued by the project are:

i. To identify and understand the presence of tacit and explicit design innovation policies in Europe;
ii. To develop new indicators that can be used to measure the impact of design innovation policies both at a macro and micro level;
iii. To activate a process of mutual learning and transnational cooperation in policy development by identifying and sharing good practices, evaluating their impact and testing their transferability;
iv. To create an open platform to stimulate and support the exchange of knowledge within the partnership as well as with other external stakeholders;
v. To actively disseminate preliminary and final results (throughout the duration of the project) to the European Commission and EDII Secretariat and to all interested stakeholders (researchers, managers, SMEs, policy makers).

1.1 Our specific role and objectives

Our thesis project was carried out with Politecnico di Milano where the DIG Department had identified among the various Italian design policies, a policy called 'Un designer per le imprese', which was promoted by the local Chamber of Commerce of Milan (CCIAA), together with external institutions and universities.

Our task aimed to investigate, through this policy's analysis and a cross-country evaluation of similar European policies, how investments in design could improve firms' performances and capabilities. Our task was fulfilled conducting interviews, synthetizing data and results achieved and through a systematic analysis of literature and case reports. To provide a quantitative support, we built a panel of micro indicators derived from the policy analysed that helps policy makers in evaluating design support initiatives through a policy cycle evaluation framework.

The objective of our thesis work was strictly connected to the entire project, we focused on specific aspects of each topic we investigated but at the same time we derived our results from a global effort on literature, case studies and synthesis of different elaborations.

After having presented the objectives and context of the script, the thesis's structure will follow with an initial part of the already known literature about design, specifically relating to the strategic role of design in Europe and the main critically and constraint about investment.

Given that the literature is still inconclusive on this issue, hence we have set ourselves to explore how the investment in design can have an impact on the competitive performance of SMEs. To measure this impact it was not enough for us to take in consideration only the turnover or profits of the companies for as they may depend on several external factors. To find our answers we have adopted the case study methodology, because we needed to analyse those companies where we knew there were significant investments in terms of design. For this reason, we considered mostly companies that have access to public policies in support of design in Italy and Europe. The final part of the research consisted in an analysis conducted on results obtained, through the use of the model we have developed in collaboration with Department of Management Engineering (DIG) of Politecnico di Milano in support of our thesis.

2. Previous studies and literature: a Design overview

In today's business and academic arenas, design is more and more viewed as an important strategic resource. In fact, over the last decade, we have seen a real explosion in business and research literature that see scholars and companies alike trying to continuously link design and competitive advantage. Design is a widely studied topic and its relationship with sustainable competitive advantage is always more investigated, here we want to present a short overview on the literature produced until now on this fundamental subject and from this, we want to move forward with our research. We can begin from the evidence as European commission states in the following research: 'Companies that invest in design tend to be more innovative, more profitable and grow faster than those who do not. At a macro-economic level, there is a strong positive correlation between the use of design and national competitiveness' (Design as a driver of user-centred innovation, 2009).

'Design can be regarded as a bundle of resources in organizations. Company resources can be physical, such as plants or equipment, but they can also be intangible such as the human resources available to the firm' (Acklin C. 2013).
'Those resources are valuable, rare, imperfectly imitable and non-substitutable, that creates a competitive advantage for a company' (Barney J. 1991).

As reported by Bedford: 'Despite growing recognition of design value in creating sustainable competitive advantage, it is difficult to quantify the contribution that design makes to company financial performance' (Bedford C, Hertenstein JH, Plat MB and Desbarats G., 2006). The goal of this recent study was to assess industrial design contribution to firms' results examining the relationship between industrial design effectiveness and company financial performance. Whit this aim a panel of 138 industrial design experts was developed and they finally ranked the industrial design effectiveness of firms within nine manufacturing industries. Starting from the ranking, all firms were divided into two groups: those estimated to exhibit high design effectiveness versus those judged to be 'low' in design effectiveness. They have found that firms with high design effectiveness had higher returns on sales and on assets, as well as higher stock market returns than firms with low design effectiveness. These results give a strong proof that

good industrial design is connected to better overall corporate financial performance and stock market performance.

It is hard to attribute in full costs and revenues to each single product. There is an increasing need to construct a robust ROI for products in order to understand the financial impact of various decisions, including the number of designers working on product development projects and the point at which they are brought into the project.

This whole question of how to measure the economic success of design and design projects has plagued business executives and the design profession for years. Peter L. Phillips, a well-known design strategy consultant, confirmed what we are investigating in, affirming: *"The cause of this dilemma is that designers focus on aesthetic considerations rather than on objective business metrics. You cannot effectively measure the economic success of a design solution with subjective criteria. At the end of the day, the only way to measure design is to measure whether the design solution met the business objectives of the design project, and whether it delivered the desired business outcomes for the project. Those business objectives should have been clearly articulated in the design brief for the project"*.

He continues explaining that design is a problem-solving discipline and in this meaning, it is what differentiates design from art. Talking about economically useful design, Phillips adds: *"A perfect design solution that doesn't solve the stated design problem could arguably be called great design, but in economic terms it is ineffective design"*. Design solutions must be technically masterful and aesthetically pleasing but obviously have to meet the firms' business objectives for commissioning the design project.

2.1 Design as a tool for competitive advantage

Nowadays, design is recognized as a strategic resource and for this reason, many studies investigate the link between design and competitive advantage (Gemser G. and Leenders M. 2001; Borja de Mozota B. 2003; Boland RJ and Collopy F 2004; Creusen MEH and Schoormans JPL 2005; Hertenstein et al. 2005; Veryzer 2005). Several scholars of management and innovation have attempted to quantify the contribution of design to the bottom lines providing interesting results and suggestions, at the same time they have often struggled with the lack of a common language and unifying theory. Some relevant and

illustrative definitions of design come from countries that have a design policy in place such as Finland, UK, Denmark and New Zealand (EU Commission 2009). We report some of them coming from the mentioned document:

The Finnish design policy of 2000, *Design 2005!*, defines design in the following way:
'Design means planning, taking account of aesthetic, ethical, serviceability and marketing and which is targeted at businesses in industry, trade and services and at public sector organizations. The object of design may be a product, a service, communications, the living environment and a corporate or organizational identity' (Finnish Government 2000).

The UK Department of Trade and Industry (DTI) said the following about design:
'Design is a structured creative process. Design is readily associated with industrial product design for manufactured products -specifically the 'look' of a product. However, the application of design is much broader, for example designing for function; for aesthetic appeal; for ease of manufacture; for sustainability; and designing for reliability or quality and business processes themselves. Service design affects how customers will experience the delivery of a service, such as a bank or a fast food restaurant. Elements of design, particularly graphic design, will form part of product, service and company branding and advertising strategy' (UK Department of Industry and Trade (DTI) 2005).

The government of New Zealand defines design as follows:
'Design is an integrated process. It is a methodology (or a way of thinking) which guides the synthesis of creativity, technology, scientific and commercial disciplines to produce unique (and superior) products, services, and communications' (New Zealand Design Taskforce 2003 in Kolmodin and Pelli 2005).

The Danish government's 2007 white paper on design, *DesignDenmark*, says the following:
'Good design is an increasingly important means for businesses to hold their own in international competition. Design has the power to make products and services more attractive to customers and users, so they are able to sell at a higher price by being

differentiated from the competition by virtue of new properties, values and characteristics' (DesignDenmark 2007).

As can be understood by the several definitions we presented above we know that design is much more than an aesthetic vision starting to appreciate the importance of correctly managing it, leading to the development of an entire stream of research based on the notion of design management (Ravasi D. and Stigliani I. 2012).

Researchers have observed how design emerges from a carefully managed process (Walsh V. et al. 1992; Roy R. 1994; Bruce M. and Bessant JR 2002) and how design management and maturity in the use of its skills correlate to a positive financial performance.

Various authors have already realized that in order to fully express its value, design should be integrated into the company culture and to the overall firm strategy (Hertenstein and Platt 1997; Trueman M. and Jobber D. 1998; Bruce M. and Bessant JR 2002; Borja de Mozota B. 2002; Lockwood T. 2004; Ravasi D. and Lojacono G. 2005; Verganti R. 2009; Zec and Jacob 2010). Some have described design as a way of thinking that can be applied to everything inside an organization in order to solve complex problems and drive a company's innovation and growth (Brown T. 2008, 2009; Martin RL. 2009). This strategic dimension of design allows it to become simultaneously a differentiator, a coordinator, and a transformational process (Borja de Mozota B. 2002), driving the company in new directions and markets (Ravasi D. and Lojacono G. 2005), improving its vision and innovativeness (Hertenstein and Platt 1997; Danish Design Centre 2003; Verganti R. 2009). Borja de Mozota B. provides evidence that companies that invest in design tend to launch products that are more profitable, Gemser G. and Leenders M. (2001) suggest that the impact of industrial design on company performance is not unconditionally positive but rather may depend on factors such as industry evolution and industrial design strategy. The findings reported here suggest that investing in industrial design leads to higher returns on sales and higher returns on assets. The higher profit margins generated by the firms that achieved good industrial design in turn could result from higher prices and/or lower costs. Designing products with features, aesthetics, ease of use, or quality superior to those of competitors can enable the firm to command higher prices than competitors.

This shift in perspective entails a very different approach to investing in design than what was traditionally considered. Simply hiring a designer or paying for an external consultant is no longer sufficient; the entire organization must embrace the new strategy and

contribute with new structures, processes and capabilities. The company culture must change radically so a mere financial investment will not be sufficient to enable the full potential of design. Furthermore, since it requires a change of the company's entire strategy, the process of fully integrating design requires a long and gradual process. Research has identified a relationship between a prolonged use of design and its strategic use as a core competency, demonstrating how just a few years of design experience limits the effectiveness of a strategic positioning of design and its impact on the activities of the firm (Borja de Mozota B. 2002). Same concept that underpin the known 'Design Ladder' that shows how design improves the competitiveness and innovation performance of a company is dependent from the company's use of design.

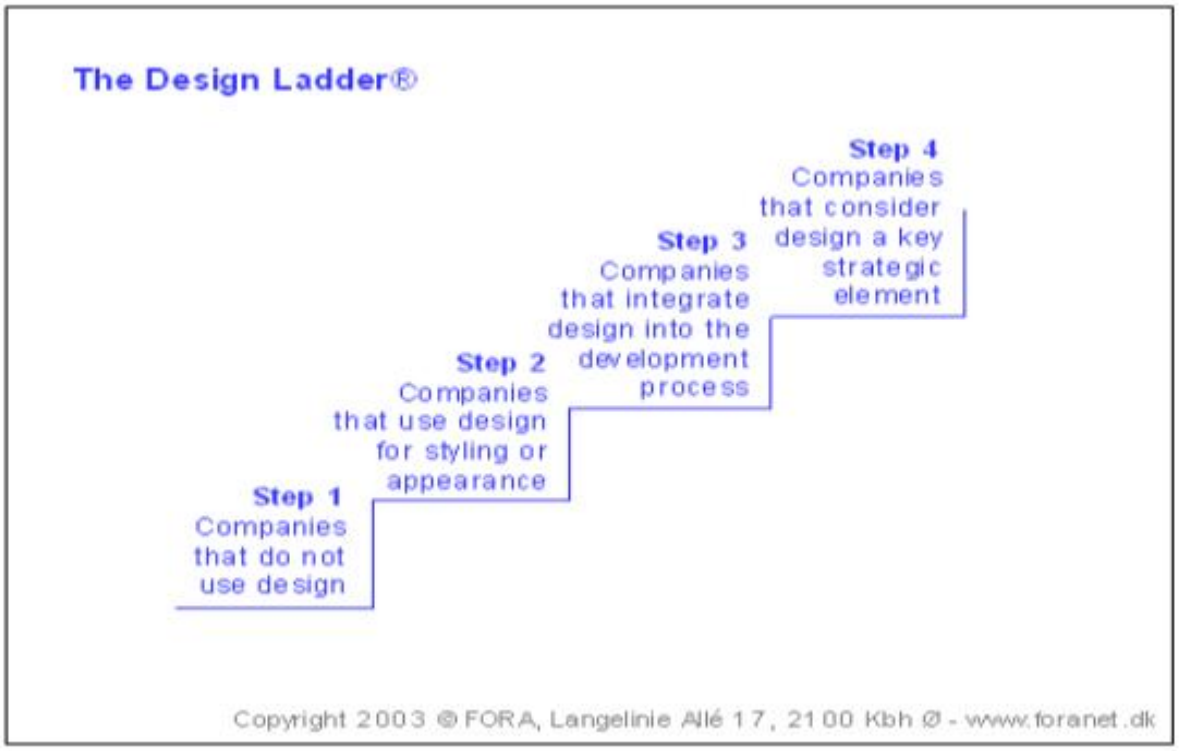

Figure 2 The Design Ladder (source: Eu commission 2009)

There has been a shift in understanding during the last 10-15 years towards an increasing *strategic view* of design in business, and towards design as an essential activity for *innovation* in business, academia and policy making as we want to highlight here.

This has leaded to the born of a number of schools of thought about the contribution of design and new terminology including words such as *strategic design*, *design management*,

concept design and *design thinking*. The schools of thought may all have their own particularities, but they also have a number of points in common, that we can show below:

- 'Focus on user-centred problem solving: Design is seen as a way of identifying and solving user problems by for example studying users and/or by involving them through visualization and participatory design techniques such as co-creation. User-centered design innovation stresses human needs, aspirations and abilities, and strives for holistic and visionary solutions' (EU Commission 2009).
- 'Design as a multidisciplinary and cross-functional innovation activity: The designer facilitates cross-disciplinary innovation processes and interactions by bringing together individuals from different corporate functions within a company, such as management, engineering and marketing, but may also bring in expertise from disciplines such as psychology, sociology, anthropology and arts' (EU Commission 2009).
- 'Design as a holistic and strategic activity: Design considerations e.g. putting the user at the centre; permeate the innovation process, from product development, customer service and management up to the highest levels of hierarchy. Rather than 'design as styling' added on towards the end of the product development process, the user is the focus in earlier (more strategic) phases. Design is a core element of company strategy and helps visualize possible scenarios to support strategic decision making' (EU Commission 2009).
- Design-driven innovation is "different from the traditional linear, science or technology-driven model of innovation. The linear model of innovation can be graphically represented as a well-defined set of stages, starting with research and resulting in innovation" (Kline and Rosenberg 1986; Godin 2005). Design-driven innovation instead puts meanings at the centre of its activity and develops a continuous process of change in those meanings, using interpreters that deal with consumers and technology as a set of resources. We know a number of successful examples such as Alessi, Philips, Apple, and Kartell and others, of companies that invest in design and research. We have seen how there is a link between design and innovation in these companies and how design has become a strategic tool.

2.1.1 Evidence of the economic value of Design

As the multitude of researches available in literature describes, nowadays design is seen as a business sectors with links and relationship with other industrial sectors. The European Commission's research confirm that: 'Design sector has been considered part of the creative industries' (The UK Department for Culture, see UK Government (Creative Britain - New talents for the new economy) 2008). In spite of that said in recent years there has been growing awareness of the economic importance of these industries as an 'Important sector in itself, but also as one with important spill-over effects on other parts of society' (Nesta 2008 and the theories of Richard Florida about the importance of the creative class). Nevertheless, we know a number of influential reports on the creative industries and the experience economy claim that the economic importance of these industries is still underestimated and underrated by public institution and firms.

A first research on the evidence of the design value, concern the 2006 KEA report on the Economy of Culture in Europe, charged by the European Commission, which state that 'The cultural and creative sectors in Europe generated a turnover of approximately €650 billion, contributed to 2.6% of EU GDP in 2003 and grew 12.3% more than the general economy from 1999 to 2003. They employed approximately 4.7 million people, equivalent to 2.5% of the active employed population in EU-25. In the UK and Denmark, for example, the creative industries are estimated to contribute as much as 5% of GDP' (BEDA 2002). As European Commission states in the document reported integrally above the magnitude of design and its relationship with creativity as a powerful enabler has grown in the last ten years greatly so that we can consider it a sector itself.

For the design sector, making a comparison between countries is difficult due to the lack of commonly agreed definitions and available data. Different studies attempt to estimate the number of designers in Europe at 410.000, creating a total turnover of €36 billion, which represents more or less the 5% of the knowledge-intensive service sector in the EU (BEDA 2006 *European Design Report* in Bager-Sjögren et al 2007). The Europe Commission report that an overwhelming majority of specialized design firms consist in self-employed with just a few employees. In a report on the Economy of Culture in Europe, it was estimated that in France 40% of the consultancies' firms employ one or two people and only 15% have 10 or more employees. Whereas in the UK there are significant differences,

where design consultancies are on average larger than in other countries, where is estimated that 73% of design consultancies employ 20 or fewer staff (KEA 2006).
According to a Danish study, design-consulting firms are generally located in the United States and Europe, or if located in Asia, they are branches of European companies or US. Key concentrations were reported on the US East and West coasts, in London and Copenhagen. What emerge through the study is that exist three main factors influencing the location of such companies: demand, proximity to universities and design schools, and an open networking culture (FORA 2007).

Another Danish study examines the structure of the design industry in general in six EU countries: Austria, Denmark, Finland, Germany Sweden and UK (Danish Enterprise and Construction Authority 2007). The research shows that Sweden is the country of the six that has the highest number of design businesses, but that they have very small size. In terms of number of design companies, the sector was growing in all six countries. The UK design sector was growing fastest, by 73% from 2003 to 2004. The UK was also the country with the biggest design sector in terms of employees, almost 20.000 in 2004, to be compared for example with Germany's 8.400, Sweden's 3.000 and Finland's 1.500 employees. In terms of total turnover, only the UK and Denmark design sectors demonstrated growth, among the six countries studied. The UK design sector grew by almost 50% from 2003 to 2004 (European Commission 2009).

2.1.2 Macro-economic analyses: Design and Ecosystem

The New Zealand Institute of Economic Research (NZIER 2003) made the most relevant and usually cited study on the correlation between design and the overall performance of a country. In order to investigate this topic, it was created a design index to make comparison between different countries and competitiveness as we report above: '(…) the NZIER made a selection of indicators or indexes from the World Economic Forum's (WEF) Global Competitiveness Report 2001-2002 to create a composite 'Design Index': capacity for innovation, production process sophistication, extent of marketing, extent of branding and uniqueness of product designs'. The ranking of countries according to the

Design Index was then compared to the growth competitiveness ranking of the WEF as presented below:

Country	Current competitiveness ranking	Design ranking
Finland	1	1
United States	2	2
The Netherlands	3	7
Germany	4	3
Switzerland	5	6
Sweden	6	8
United Kingdom	7	10
Denmark	8	9
Australia	9	21
Singapore	10	22
Canada	11	15
France	12	4
Austria	13	12
Belgium	14	16
Japan	15	5
Iceland	16	14
Israel	16	14
Hong Kong SAR	18	24
Norway	19	18
New Zealand	20	20

Table 3 Countries ranking based on their competitiveness and use of design (Source: World Economic Forum 2002 in NZIER 2003)

As a one-off exercise, this comparison provided evidence of the correlation between the use of design in a country and its overall competitiveness. Nevertheless, we can affirm that although there is a very strong correlation between the use of design in a country and its overall competitiveness, research does not say anything about causality. This is confirmed by the European Commission research: '(…) it is reasonable to assume that if the impact of design on individual company performance is positive, then the aggregated impact of companies' use of design in a country should be positive on a macro-economic level as well. (…) However, if a number of factors influences companies' performances, this is even truer for the macro-economic performance of a nation. Although important, it is unlikely that design can be singled out as an explanatory factor for competitiveness, and its effects isolated from other important factors such as institutions, framework conditions, business practices and culture' (EU Commission 2009).

2.1.3 Framework for a national Design System

In measuring and comparing innovation, it is recognised that no single indicator can provide a comprehensive picture of performance, and thus it is necessary to look across a range of indicators (DTI, 2003). A common approach for innovation is to consider a set of indicators that collectively describe the overall *Innovation System* in a nation (Livesey F, Minshall T, Moultrie J, 2006).

A *national design system* is proposed by Dr. James Moultrie and Finbarr Livesey, (2009), drawing analogies from this concept of a national innovation system. This model provides a framework for the national investment in design promotion illustrated in figure 2.

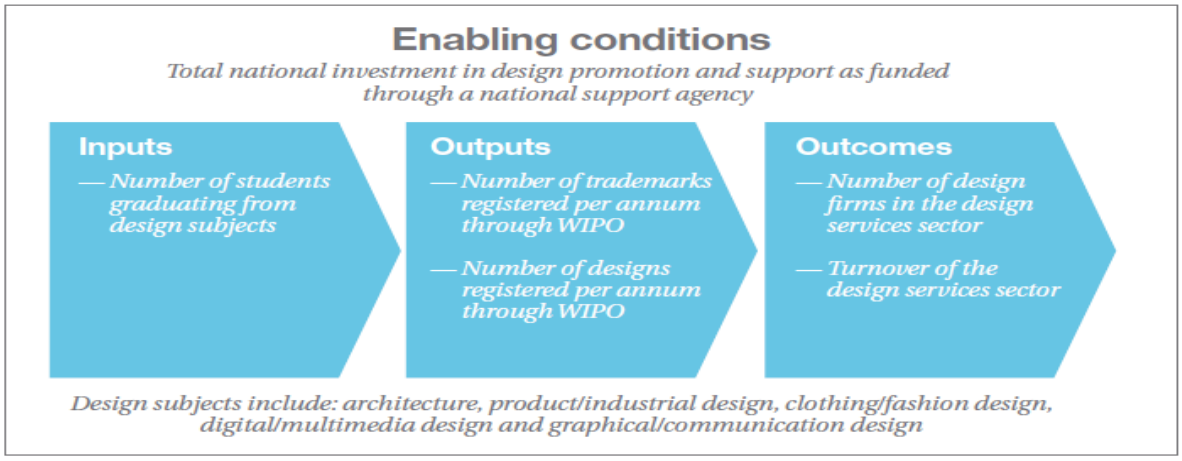

Figure 3 Framework for a National Design System. Source: Dr James Moultrie and Finbarr Livesey, (2009)

In this generic framework, the authors describe the specific issues that would be relevant to design for each category:

1. *Enabling Conditions:* including national policies, strategies, institutions and endowments. Many national governments are actively involved in design promotion through programmes that promote design to both business, particularly small and medium sized firms;
2. *Inputs/capabilities:* the development of human capital relating to design, including design graduates, designers in the workforce and those working in the design sector;
3. *Outputs:* intellectual capital generated as a result of design activity, including design registrations, trademarks and receipt of design awards;

4. *Outcomes:* reflecting the impact of the outputs on the overall economy. A significant indicator here is the overall strength of the design services sector in terms of turnover, employment and exports.

Despite literature clearly highlights the strategic role of design, talking about design in Europe today's contest means to speak only to a portion of companies and especially to a veritable selection of cities that shine under the light of design, which have always been a centre of gravity for investments, designers and design schools. Probably the very nature of the design and the difficulty of communication between the design world and the business world have played an important role in the delineation of this view. The benefits of design investment are not yet sufficiently known to policy makers and companies, the design sector does not yet have a clear innovation profile, and many educational institutions have not yet adapted their curricula to the changing nature of design. Some companies consider or believe that design projects are too expensive, and lack of awareness of what a design project actually costs or how to evaluate it. Companies, particularly SMEs, often lack the resources, expertise and methods to evaluate the risk and the rate of return on design investment.
We want to bring some of the main difficulties in the following paragraph, in a work conducted by European Commission, based on a number of studies and previous researches made by scholars and design national institutes of the European countries.

2.2 Barriers to use Design in Europe

A number of potential barriers exist to better use of design for innovation in Europe. Some of them are linked to the broad nature of design, which may make it difficult to grasp, while others are related to recent developments in the concept of design, meaning that its role in the context of innovation and competitiveness is only just emerging. As reported above by European Commission, among firms exist barriers like potential design-users or buyers, in SMEs particularly, because they often have little experience of design, they do not know what to expect from design, or how to find professional help or integrate design into their innovation processes. Besides its heritage and its history, issues and problems that prevent it to use design at a full potential affect Europe.

The designers are poor in business knowledge and other soft skills that are necessary to have a better insight into the business and innovation community.
A professional training targeted on active designers may be needed to take better account of recent developments in design-driven innovation. Design research is still a small discipline if it is compared to other fields of study, and it is often poorly integrated with the more consistent discipline of innovation research.

When you ask about the relationship between design and innovative products, most people usually say that this relationship is strong, and that the value or willingness of well-designed products is bigger than that of products with an ordinary 'look and feel'. Previously we showed that the relationship between design and innovation is not only intuitive, but also confirmed by a great number of studies into the economic impact of design. Despite these considerations, many firms do not use design in a systematic or strategic manner. SMEs and companies in low-tech sectors for example, usually spend less in relation to design than their larger high-tech counterparts do, even if design seems specifically suited to SMEs, as it is an innovation activity that requires low capital and has short payback periods.
The question is: *Why then does design not attract more attention and interested companies than it does?*
We can answer to this question highlighting how although design is nothing new. Its relevant role in the field of innovation, competitiveness, and social and environmental sustainability is recent in relation to societal developments (such as global competition, increasingly sophisticated consumer demand, and greater environmental and social awareness) and for that design is only just now emerging as a strategic driver in competitiveness.
It takes time for attitudes and institutions to adapt to what is new, particularly when the new concept is difficult to define. In the meantime, a number of barriers and obstacles, as market and systems failures, are dangerously threatening the use of design as a tool for innovation in Europe. Trying to move some of these barriers at a national or European level, or counterbalancing their results, could be the purpose of a European policies in support of design innovation and could give Europe a competitive advantage and head start

in an area that is going to become more and more important in the global competition landscape.

2.2.1 Barriers to the use Design in companies

Is resulted, by a number of analysis made by Cox et al, Ahrens, the Irish Centre for Design Innovation and Polish Ministry of Economy, that exists a combination of reasons why companies, in particular SMEs, are not more active in design. Those reasons as sourced by the studies cited above are mainly:

- Limited ambition or appetite for risk;
- Lack of resources and multiple pressures on the business;
- Lack of belief or confidence in the value of the outcome;
- Lack of awareness and experience;
- Lack of knowledge of how and where to turn for specialized help;
- Inadequate support mechanisms.

These factors vary between attitudes that are consistent and hardly editable, to conditions that should be partly external to the company and could be targeted only by public actions. The previous consideration shows that usually SMEs are not fully aware of the potential of design, but even in the case they were potentially interested, they would have issues in finding external support. “Larger design consultancies are concentrated in big cities and therefore not easily accessible to all potential clients” (Irish Centre for Design Innovation 2007); this shows a barrier to the access to those resources and tools that for small and medium enterprises could be insurmountable. The sourcing issue is not only an issue of budget, but also a geographical issue. If we talk about very small design companies, we have to reckon that they often lack resources to market their activities to a wider circle and make them bigger and larger. That is the reason why many companies, in particular SMEs and companies not situated in big cities, do not know how to access quality design support and even where to find information or design advices.

More than this, even if they do find designer somehow, companies often lack the experience and knowledge to introduce design into their innovation processes, and to exploit fully the potential of design. Research shows that the most successful design

projects are those where ‘designer is the most integrated and has the most contacts with the rest of the company’ (French Ministry of Economy, Finance and Industry 2002). This point of view complete the consideration we made before that barriers in using design at a full potential are related to hard factors but also to soft factors as for example the integration of a designer in a project.

“In economic terms, design services are ‘experience goods’, e.g. a product or service whose characteristics (such as price or quality) are difficult to observe in advance, but these characteristics can be ascertained only on consumption, in contrast to a ‘search good’. With experience goods the perceived quality tends to vary widely, encouraging information asymmetries and therefore market failures” (Tether in SEEdesign Bulletin Issue 3, 2006) and this variety is perceived, particularly from SME’s, as a potential risk they might not be willing to run.

2.2.2 Barriers to growth Design-businesses

As discussed above, the design sector is dominated by very small companies. Being small has its advantages, but it also means that design companies often lack resources to grow and reach new markets, and to engage in training. Many designers have low or a lack of experience, skills and knowledge of recent studies and developments in strategic design, design management and design-driven innovation. This lack of knowledge obviously makes their integration into the innovation community and their contribution to innovation very difficult when not possible. As we see being a SMEs should bring difficulties in sourcing talents or skilled people in the design world but also difficulties in training those resources in order to fully exploit their potential. In companies or between companies and designers there may also be an issue of professional culture when the designer sees him/herself as an external skilled worker and a simple form or aesthetic giver, and as part of the artistic landscape rather than the business and innovation community. This potentially complicates communication and collaboration between designers and the business and innovation community and besides between designer and companies that employ those designers.

2.2.3 Barriers in education, training and research

The lack of designers with the right skills, that implies the lack of design perception and development in companies that employ those designers, is another area where countries must play a relevant role. The role of design education, although it is very important, cannot be overestimated as a driver of design excellence and competitive advantage. Moreover, this is an evidence that many governments achieved, particularly those countries where is in place a formal design policy. In many cases, however, the number of design students is not the problem; in some countries, design graduates demonstrate higher levels of unemployment than those of other professions (Danish Enterprise and Construction Authority 2007). While for example the Nordic countries are experiencing a boom in small design firms started by recent design graduates, there is also a high failure rate among these firms and little replenishment of the population of successful design firms (Nordic Innovation Centre 2006). This is a problem, while the rate of entrepreneurship is high, the rate of new-borns companies' survival falls and lead to unemployment.
Nowadays the challenge is the lack of designers with the right skills and experience in view of recent developments in the area of design, such as strategic user-centred design, eco-design, design for all, design management and computer-aided design. For companies and particularly for small and micro ones in-house designers without these skills should present problems and have difficulties in building bridges between the technical and commercial departments. In the same way, designers without entrepreneurial skills should find difficulties in starting and growing their own start-up or business.
Those problems and issues need to be faced with an education either academic or not that better integrates design with management, basic business and entrepreneurship. In order to reach this goal, issues may be addressed by continuing professional development and training throughout designers' careers.

We know that probably the designer demand will grow in the coming years, so it is important not to allow the quality of education to go down. Certain Asian countries are for example shortening the length of the design education to be able to cope with demand. "It has been noted that design research is an underdeveloped area and that more high-level R&D in design is necessary to develop design as a competitive advantage and innovation

driver on a national or regional level" (Nordic Innovation Centre 2006) and this can be done only maintaining an high level of education.

In order to make design a strategic advantage, is important that the entire enterprise and not only the designers in a company understand the potential of design and the reason of its implementation. Design has been suggested as an integral part of business school training and in engineering and architecture courses or field of study, in the same way management should be an integral part of design education.
Recapitulating the analysis, we reported above about studies and literature related to design has shown that there is a clear potential to improve innovation performance and competitiveness for SMEs using design. The analysis of the study above shows that some European companies and countries are world leaders in design, both in terms of design performance and in terms of political awareness and action. There are however great discrepancies between different types of companies, and between Member States. Some issues related to design are already addressed at EU level, such as those linked to design protection, but an explicit integration of design into European innovation policy is still lacking (EU Commission 2009).
The problem of a different approach to design in Europe represent the major threat to its leading role in the worldwide design and highlight the issue of existing barriers in design application, one of the main task of the regulator must be to harmonize the European approach to design.

In the context of innovation policy, it may be necessary to demarcate the concept of design, as the DeEP project aimed to do, to arrive at an operational definition for policy development. The following suggestion of European Commission could be a starting point, to be further discussed and developed:
"*Design for user-centered innovation is the activity of conceiving and developing a plan for a new or significantly improved product, service or system that ensures the best interface with user needs, aspirations and abilities, and that allows for aspects of economic, social and environmental sustainability to be taken into account*".

2.3 Investment in Design and Competitive Performance

After the analysis of the literature about design as a tool for competitive advantage and the main barriers existing, we found extremely interesting the study of Dell'Era C., Altuna N. and Verganti R. (2013), that organizes the entire production of researches on this topic in two different streams as presented in figure 3.

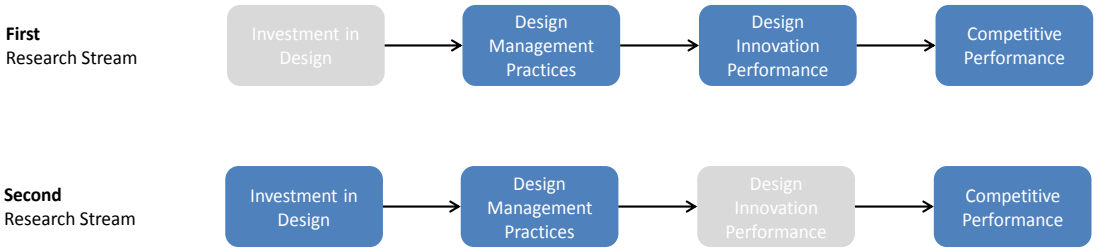

Figure 4 Conceptual Framework research stream

The first stream analyses the impact of *design innovation performance* and *design management practices* on competitive performance, while the second investigates the impact of *investment in design* and *design management practices* on competitive performance.

The first research stream investigates the relationships between innovations based on design and competitive performances: several scholars approximate the capability to launch on the market design-driven innovations by considering the number of design awards or by asking design professionals to rate skills and achievements shown by the companies; those firms characterized by a successful use of design consistently outperform their competitors on a wide variety of financial indicators (Roy R., 1994; Swan KS.et al., 2005; Bedford et al., 2006; Gemser G. et al., 2011) and even in overall stock performance (Hertenstein et al., 2001; Rich, 2004). The effects of good design appear to have long term effects that are persistent and stable over several years (Roy R., 1994; Hertenstein et al., 2005), whereas the effects on sales of technical newness has been shown to decrease as the product reaches its maturity, an innovative design is a significant driver of sales over the entire product life-cycle (Talke K. et al., 2009).

The second research stream investigates the relationships between competitive performances and investments in design, with the aim of identifying some sort of Return of Investments (ROI) for design (Wallace R., 2001; Zec and Jacob, 2010). Companies with higher design budgets generally show better financial positions than their competitors (Gemser G. and Leenders M., 2001; Swedish Industrial Design Foundation, 2004; Candi, 2010). However, the results derived from an investment in design are significantly influenced by the managerial practices adopted by the company (Danish Design Centre, 2003; Chiva R. and Alegre J. 2009). Some authors note that financial indicators alone cannot capture the full value of design: the impact of design on a company's performance is multifaceted and mediated by various other factors, making it difficult to measure by just analysing financial data (Borja de Mozota B., 2006; Gabrielsen et al., 2007). Indeed, the effects of design can be tangible when they generate direct financial returns for the business but may also be intangible when they contribute to the future performance of the company by affecting difficultly quantifiable factors such as the cultural and strategic assets of a company (Inns T., 2002).

Both studies are based on particular characteristics, specific to each company, which can be improved or strengthened. Gemser G. and Leenders M. found a positive relationship between design investment and company performance. However, as these authors state, it seems very likely that the impact of industrial design on company performance will vary depending on the skills and talents of the designers involved. These skills are recognized by the name of **design capabilities**.

2.3.1 Design Capabilities

In past research, design management scholars (Kotler P.& Rath G. A. 1984; Dumas & Whitfield 1990; Bruce M.; Perks, Cooper & Jones, 2005; Borja de Mozota B. 2006; Chiva R. and Alegre J. 2009) identified different design capabilities in organizations, some extract them from product development processes (Perks, Cooper & Jones 2005) or from the design management use of design oriented companies (Borja de Mozota B. 2006), others detect a connection between an in-house design team and the design management skills of companies (Chiva R. and Alegre J. 2009).

Jevnaker B. H. (1998) lists the following capabilities in organizing design and its management:

1. Resourcing capability: the ability to acquire and manage profitable design resources;
2. Combinative capability: the ability to configure design resources;
3. Organizational learning capability: the absorption capability;
4. Innovation capability;
5. Design-strategic capability: the ability to integrate design into business strategy;
6. Protecting capability of design-based advantages.

According to the resource-based view (RBV) of the firm, a firm's competitive advantage comes from capabilities based on resources that are rare, valuable, and difficult to imitate or substitute (Barney J. 1991; Wernerfelt 1984). From strategic management studies, Amit and Schoenmaker (1993) clarify the meaning of capabilities defining them as the capacity to deploy the resources. Like resources, these capabilities are firm specific and are developed over a longer period through learning processes. They are information based, tangible and intangible processes and they can abstractly be thought of as intermediary goods generated by the firm to provide productivity of its resources, as well as strategic flexibility and protection for its final product or service.

We can move from here in order to introduce the set of design capabilities we referred to in our project. Starting from the list of Jevnaker many scholars and researchers went in depth trying to better define and understand what kind of skills and competencies underpin design capabilities and their impact. Very interesting is in this view the study on 'Dynamic Capabilities' made by Teece and Pisano. They refer to resources as "firm-specific assets that are difficult if not impossible to imitate. Trade secrets and certain specialized production facilities and engineering experience are examples. Such assets are difficult to transfer among firms because of transactions costs and transfer costs, and because the assets may contain tacit knowledge". This shows how knowledge in firms and those capabilities that drive processes and changes in companies are core capabilities, which can influence the overall firm on its competitiveness and on its business environment.

The competencies that Teece and Pisano show can be defined as "core competencies" or "those competences that define a firm's fundamental business as core. Core competences

must accordingly be derived by looking across the range of a firm's (and its competitors) products and services. The value of core competences can be enhanced by combination with the appropriate complementary assets. The degree to which a core competence is distinctive depends on how well endowed the firm is relative to its competitors and on how difficult it is for competitors to replicate its competences" (Teece, Pisano, 1997).

An additional step drives us to the central concept of Teece and Pisano's study, the concept of "dynamic capabilities". The authors refer to those central drivers of company's advantage as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions (Leonard-Barton, 1992)".

There are many dimensions of the business firm that must be understood if one is to grasp firm-level distinctive competences/capabilities we merely report the Teece and Pisano's study that presents and identifies several classes of factors that will help determine a firm's distinctive competence and dynamic capabilities. We organize these in three categories: *processes, learning* and *assets*.

Processes

Three dynamic capabilities are necessary in order to meet new challenges. Organizations and their employees need the capability to learn quickly and to build strategic assets. New strategic assets such as capability, technology and customer feedback have to be integrated within the company. Existing strategic assets have to be transformed or reconfigured.

Learning

Learning requires common codes of communication and coordinated search procedures. The organizational knowledge generated resides in new patterns of activity, in "routines", or a new logic of organization. Routines are patterns of interactions that represent successful solutions to particular problems. These patterns of interaction are resident in group behaviour and certain sub-routines may be resident in individual behaviour. Collaborations and partnerships can be a source for new organizational learning, which helps firms to recognize dysfunctional routines and prevent strategic blind spots.

New assets

The effective and efficient internal coordination or integration of strategic assets may also determine a firm's performance. According to Garvin (1988), quality performance is driven by special organisational routines for gathering and processing information, for linking customer experiences with engineering design choices and for coordinating factories and component suppliers. Increasingly competitive advantage also requires the integration of external activities and technologies: for example in the form of alliances and the virtual corporation.

Transformation of existing assets

Fast changing markets require the ability to reconfigure the firm's asset structure and to accomplish the necessary internal and external transformation (Amit and Schoemaker, 1993).

Co-specialization

Over time a firm's assets may become co-specialized, meaning that they are uniquely valuable in combination.

The combination gives a firm a more sustainable competitive advantage (Teece, 2009 and Douma & Schreuder, 2013).

Asset orchestration

If capabilities are dependent on co-specialized assets, it makes the coordination task of management particularly difficult. Managerial decisions should take the optimal configuration of assets into account. "Asset orchestration" refers to the managerial search, selection and configuration of resources and capabilities. The term intends to convey that, in an optimal configuration of assets, the whole is more valuable than the sum of the parts.

From the Teece and Pisano's research we can move and be aware that capabilities represents in business the most important and difficult to manage driver that can be touched in order to increase performances or gain a competitive advantage.

As we experienced, the principle to evaluate design innovation policies starts from the idea of capabilities. 'Capability is a measure of the ability of an entity (department,

organization, or system) to achieve its objectives, especially in relation to its overall mission' (www.businessdictionary.com).

Design has been connected to capabilities by defining it as follows:
Design is a set of capabilities that enable people-centered innovation. This definition is strictly connected to the EU understanding of design as an activity of people-centered innovation by which desirable and usable products and services are defined and delivered (Design for Growth & Prosperity, p.15).

The definition of design capabilities will support the main hypothesis of the DeEP evaluation framework:

1. The effectiveness of a design policy is measured by the positive change and transformation in the stock of design capabilities observed in design policies beneficiaries. The main objective of both macro and micro indicators is to measure this change or transformation.
2. Competencies are recognized in three macro areas: *Design Leadership*, *Design Management*, *and Design Execution*. Each of these is divided in one or more specific skill to detail the focus of the area:

   i. **Design Leadership** (holistic view, how people give meaning to things) is encountered when design participates to the strategic choices of the firm, so that a design-driven innovation strategy is the core activity carried out through a people centred approach.
   ii. **Design Management** (visualizing and materializing, managing the design process) is the ability of managing design resources, in terms of human resources, design process and creativity, economic resources.
   iii. **Design Execution** (applying new technologies) involves the presence of human resources with technical skills, design technologies and infrastructures, investments in the NPD process.

Here is for us important to introduce the whole concept of design capabilities and explain the five different capabilities we focalized on in our research. According to the distinction

mentioned above and regarding the literature, we can introduce five main design capabilities that complete and explain in a deeper way the macro-distinction of *Design Leadership, Design Management* and *Design Execution*. The further classification aims to answer specifically to different characteristics and features that have been highlighted and hypothesized for firms within the DeEP project lead by Politecnico di Milano.

We know that for each firm different skills and characteristics are needed in order to carry out a process, specifically some researchers focused on the design process in order to map and better define which kind of skills where necessary and how these particular characteristics could be enforced or impacted by actions or investments. Interesting for us is the example of dynamic capabilities (Teece and Pisano, 1994, 1997, 1998; Eisenhardt and Martin, 2000) we presented above, that are presented as capabilities that enable innovation, absorption and competitive advantage in the medium-long period, we move forward from that definition and analyse the capabilities linked to design. We can describe the five design capabilities as follows:

1. *Holistic view*: The holistic view can be described as the capability of a firm to manage design as a whole process deeply linked to the firm's strategy and the medium-long period planning. This can be seen as the ability to consider every process, every activity as part of a unique stream of value that must be managed as a bundle in order to achieve a sustainable competitive advantage.
2. *How people give meaning to things*: This capability can be described as the ability to understand the perception process of customers and people outside the company. This capability enable the firm in a design-driven view (Verganti R., 2007) to better understand how users give meanings to products or objects they use or they meet for the first time. This enables firm to target and calibrate strategically how something must be developed and presented in order to acquire a meaning that meets the user perception and fits the willingness of the company.
3. *Applying new technologies*: The capability applying new technologies deals with the ability of a firm to integrate and implement new methods, machines, tools or skills to better manage the company's process or in general the set of activities the firm does. The implementation of innovative technologies enables the firm to do new activities or to empower the general process of production in order to be more competitive. This capability seems to be narrower than the previous ones and be

more in a certain way "operative" but is important to stress how this ability enables also the other four capabilities we described.

4. *Visualizing and Materializing*: This capability deals with the ability of an enterprise to conceptualize and actually give physical substance to ideas. The management of design regarded under this point of view means be able to develop a concept through skills and features that enable the firm in this process. Developing an idea, from the concept to the product, e.g. through prototypes and physical pilots is the main characteristic of this particular capability.
5. *Managing the Design process*: In order to describe this capability we must remember that we are talking of management in a design-based view. This capability is, for an enterprise, the ability to successfully lead and manage the process that is mean as a bundle of activities the company follows from the product concept or idea to the commercialization of it. This capability embodies the idea that a process within a company is made by a number of sub-processes or set of activities deeply connected between each other and managing it means approaching to it as a unique stream of value.

2.4 Design and Innovation

We start from the first stream of researches in order to investigate how design-based innovations enable the increase in competitive performances of firms.

It is indisputable that economic growth depends on the production of new ideas and innovation; however, competitive markets do not provide appropriate incentives for such activities. There is increasing recognition that differentiation based on technology alone is not sufficient to ensure success in innovation (Crawford and Mathews, 2001; Norman, 2004). Instead, the use of design or industrial design has been suggested as a mean for achieving such success (Gemser G. and Leenders M., 2001; Hertenstein, Platt and Veryzer, 2005; Roy R. and Riedel, 1997; Walsh V. et al., 1992). Nowadays design is perceived as a critical factor of success for innovative enterprises and firms, while on the other hand design is seen as a tool for innovation. Design can play an important role in innovation, not only as a creative domain for generating ideas but also as a domain concerned with

creating a bridge between technical features and functionality on one hand and market opportunities and acceptance on the other.

A recent report from the UK Treasury described design as the journey between creativity and innovation. Due to its nature of the "glue" between these two quantities, nowadays design has a huge role to play.

Creativity and design play a role as an input to innovation, but it can also have a direct effect on productivity and business performance, through process design, branding and marketing.

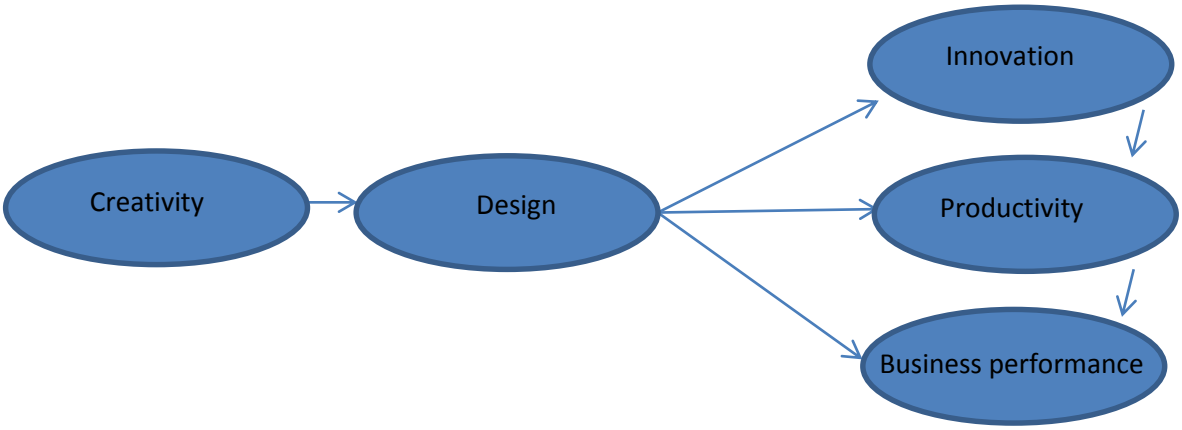

Figure 5 Linking Creativity and Design to business performance (Source: Swann and Birke 2005)

Researchers and scholars of design-driven innovation states that it is a form of innovation that is built on Europe's existing strengths, its heritage, diversity, authenticity and creative potential, to adapt to global markets, and therefore represents a competitive advantage from a European point of view. It is also considered as a competitive advantage with potential for the future.

As a recent survey of UK manufacturing firms shows, 55% of firms see design and development as one of their most important sources of competitive advantage in five years' time. This is three times as many as the number of firms that consider research as important; as described by the graph below.

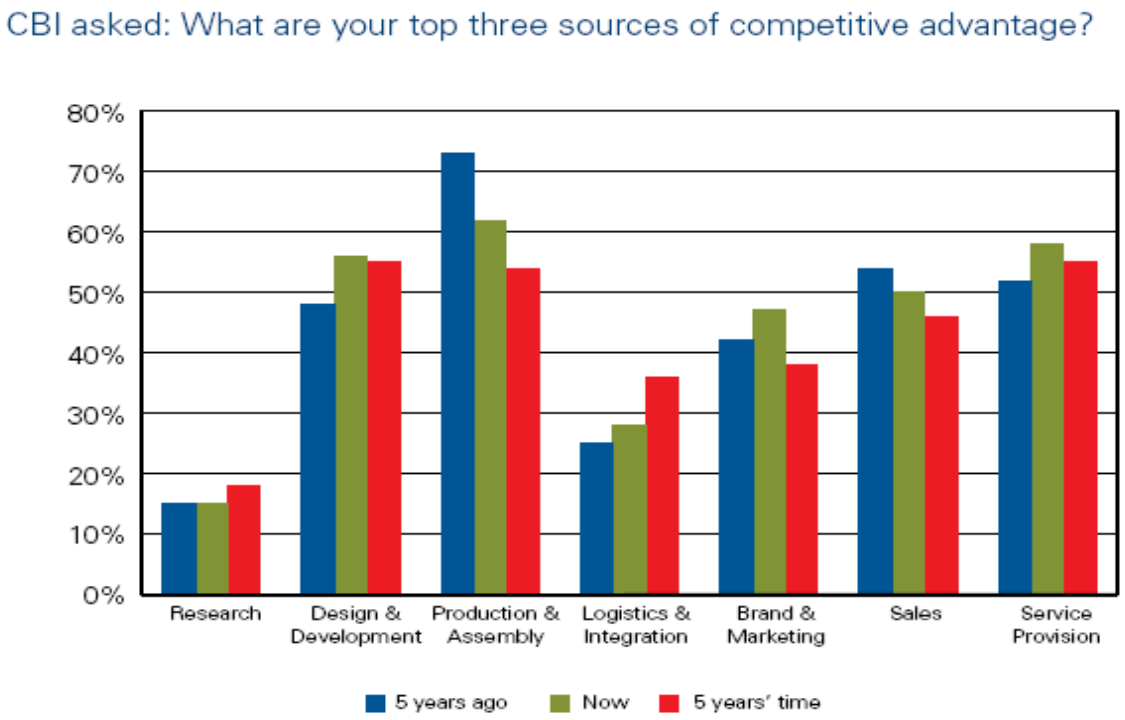

Figure 6 Top three sources of competitive advantage to UK manufacturing firms (Source: EU Commission; BERR 2008b)

The current scenario is characterized by a relocation of production in those emerging countries identified with lower-cost labour. The most developed country has accepted that phenomenon with the awareness that high-value activities like technology, research and development, innovation and design, will remain. Unfortunately this was the few decades ago scenario, in fact nowadays we are witnessing a relocation to country like Korea also of many higher-value activities. As a result, in 2005 Former Design Council Chairman Sir George Cox noted that many emerging economies are positioning themselves as sources of creativity and design, not just providers of low-cost production. Brazil, Russia, China, Korea, Singapore and Taiwan, are all emerging as important players in design globally. The Cox Review concluded that *"(...) strength in design at a national level is necessary for on-going economic sustainability"*.

Innovation is the implementation of a new or significantly improved product (good or service), process, marketing method, a new organizational method in business practices, workplace organization or external relations (OECD-EU 2005). That is a broad and general

definition of innovation that touches a variety of subordinated types of innovation such as: products, services, business models, process-innovations and so forth.
Innovation can be defined as *"The successful output that results from innovating activities, where these activities are all those that either lead or are intended to lead to the implementation of innovation"* (OECD-EU 2005). These activities range over the entire process of innovation; they goes from attracting input to methods of value capture of implemented or marketed innovations. Innovation activities themselves could, but do not have to be innovative as long as they contribute to actual or intended innovation.
Schumpeter introduced a new perspective on the nature of competition in market economies–one dominated by innovation and the dynamics of 'creative destruction'. In so doing, he opened up new perspectives on the nature of competition itself. At a more macro-level, the Schumpeterian perspective focuses on the role of innovation in transforming existing industries and markets and constructing new ones and shaping the competitive battles between firms. But perhaps even more importantly, where older models primarily focused on competition in product or factor markets, the Schumpeterian perspective forces consideration of the processes involved in invention, discovery, and capability creation; processes that underlie innovation and the dynamics of creative destruction. From this perspective, competition in markets is complemented by activities focused on knowledge creation and capability creation. For firms, knowledge creation becomes a strategic end unto itself; for scholars, the phenomenon of knowledge creation becomes central in the fields of strategy, entrepreneurship, and innovation.

Above we presented several studies that investigate how innovation based on design is related to increasing competitive performances. The relationship between design and innovation have been stressed by many researchers but very significant is the study of Roberto Verganti that shows how 'Radical innovation of products' meanings leads to products with long lives, significant, sustainable profit margins, brand value. Companies' growth hardly starts from a close observation of user needs and requirements. Instead, rather than getting close to users, breakthrough firms follow a different strategy: *design driven innovation*. They take a broader perspective by investigating the evolution of culture, society and technologies, and make proposals, putting forward a vision about

possible new product meanings that people have not solicited but that they were eventually just waiting for' (Verganti R., 2009).

2.4.1 Design and Innovation in Small to Medium Enterprises (SMEs)

Scholars and public bodies investigated this subject and produced papers and studies on the sustainable advantage that firms can reach by innovating through design processes. They studied the topic with the aim to understand the relationship between design, seen as a comprehensive process, and performances growth in small and medium enterprises.

A series of studies presented by literature prove the positive impact of design on corporate performance thanks to the presence of some fundamental factors that have been identified through surveys of companies on the perception of design and others through statistical analysis, these are profitability, share price, employment and exports. Based on researches made on companies to understand their perception of the benefits that arise from design it has resulted that the most important factor that contributes is to strengthen the brand, from this: 53% of Swedish companies consider that design has a major positive impact on brands (Swedish Industrial Design Foundation (SVID) 2008b). 70% of Spanish companies consider that design has a major or considerable impact on company image (DDI: Sociedad estatal para el desarrollo del diseño y la innovación, 2005).
European commission worked and published an interesting and very useful study named "Design as a driver of user-centered innovation" (2009) that we want to present as follow because we think it plays a relevant and central role in our study and more in this literature review. The document shows that many companies also consider design to have a direct impact on a number of 'hard' performance indicators, such as sales, cost and profitability:

- '32% of Swedish companies consider that design has a major impact on sales (SVID 2008b); more than 40% of Spanish companies and British companies and 66% of Norwegian companies, consider that design has a major or considerable impact on sales. Design was also considered to have a major or considerable impact on new market entry by 65% of Norwegian companies, 56% of Spanish companies, and 46% of British companies (DDI 2005).

> Even country like Poland have that kind of perception, a survey of Polish companies, in fact, shows that approximately one third of Polish companies perceive that design has had a positive impact in the last 12 months on sales, market share, new market development and competitiveness (Polish Ministry of Economy 2007. The report refers to the definition of ICSID)'.

The European commission study goes on reporting that:

- 'Generally companies consider design to make a more modest contribution to cost reduction; 9 % of Swedish companies consider that design has 'a major impact' in terms of reducing costs; 50% of Spanish companies consider that design has a major or considerable impact on productivity.
- As regards profitability, 60% of Swedish companies agreed totally or partially with the statement that there is a clear positive correlation between design and profitability (SVID 2008); 81% of Spanish companies consider that design has an impact on profits, compared to 75% of Norwegian companies and 42% of UK companies. More than 50% of Spanish companies considered this impact to be major or considerable (DDI (Sociedad estatal para el desarrollo del diseño y la innovación), 2005). The Polish survey shows that around one third of Polish companies consider that design has had a positive impact on profits in the last 12 months (Polish Ministry of Economy 2007)'.

The importance of the issue addressed here shows how in the literature you can find also a number of statistical studies based on analysis of company performance rather than on self-assessment. They highlight different correlations for example between the use of design by a company and its performance on the stock exchange (The Design Index), its profitability, growth revenues, employment and exports (Danish survey) as described below:

1) United Kingdom - The Design Index

'In 1998 Fitch, a UK-based design consultancy, compiled a hypothetical 'design-led' portfolio of its publicly listed US companies and compared the performance of that fund

over a five-year time period with the market index. The hypothetical fund increased 41% while over the same period the market index gained 14%.

In 1999, the UK Design Council applied this approach to a set of 6 hypothetical funds comprising British design-embracing firms. The six funds performed between 5% and 28% better than the market index between 1995 and 1999. An aggregate fund of all 95 companies involved performed 10% better than the FTSE index (KEA 2006)'.

2) Denmark - Study for the National Agency for Enterprise and Housing, 2003

A survey carried out by the Danish Design Centre for the National Agency for Enterprise and Housing in 2003 on over 1000 private Danish companies with at least 10 employees each found that:

1. 'Danish companies that purchased designs over the previous five years had registered 22% above average growth in gross revenues;
2. Companies with an increase in design activity achieved an additional 40% of gross revenue increase compared to companies where design activity was either constant or had decreased;
3. Companies that employed design professionals and purchased design externally had exported 34% of their turnover on average compared to 18% by companies that had adopted a different design purchasing approach or none at all;
4. There was a positive correlation between design and employment, since job creation was higher in companies that had employed design compared to companies with no design activity;
5. Gross revenue performance was better and the number of exports greater the higher companies ranked on the *design ladder* (Danish National Agency for Enterprise and Housing 2003 in Bitard & Basset 2008)'.

3) UK Design Council - Value of Design Factfinder, 2007

The UK Design Council carried out a national survey of 1500 UK firms in 2005, and another 'added value research' survey of 500 UK firms in 2006. Both together present interesting results:

1. 'Every £100 a design-alert business spends on design increases turnover by £225;
2. Shares in design-led businesses outperform key stock market indices by 200%;

3. Businesses where design is integral to operations are twice as likely to have developed new products and services. In the past three years, four-fifths of them have, compared to a UK average of 40%;
4. On average, design-alert businesses increase their market share by 6.3% through using design;
5. Turnover growth is more likely for businesses that increase their investment in design. Conversely, those that decreased investment cut their chances of growth;
6. Rapidly growing businesses are twice as likely as the UK average to have increased investment in design. Over two thirds have done so recently (UK Design Council 2007)'.

The factors taken in consideration here above are considered of central leverage in Europe in order to empower competitiveness and this because the industrial and business environment is made for the large part by SMEs.
Thanks to the analysis and the literature produced on this subject, we want to grow and get ahead of our present situation with the aim of understanding more in depth how design innovation impacts on firms' performances. To achieve this objective we must be conscious of what we mean when we speak about innovation and how we can evaluate it.

2.5 Firms' performances and Design Policies

In order to map and investigate this topic we refer and study public initiatives that aim to support SMEs competitiveness using design. Public policies represent the expenditure of limited public resources and restrictions on certain types of individual or organizational behaviours. Consequently, the public has the right to expect their government officials to be accountable for the validity, efficiency, and effectiveness of these policies.
When public institutions provide policies in order to support enterprises and economic systems, and when the policy has been formalized and structured through the adoption of norms, rules and general acts, some forms of evaluation need to be accomplished to determine if the policy has achieved the desired outcome or impact.

Design Policy

In this section we introduce the design policies, the reason they play such important role in the research is that they represent tools to invest in design which are subject to less ambiguity of definition and evaluation of results. While other types of investment can touch more "areas" and therefore not be directly attributable to design, design policies are support work immediately assignable to design study and investment in design.
Design policies are the real "injections" of design in the companies; they represent investments in design in the broadest sense not only monetary but also of resources and expertise.

Raulik-Murphy and Cawood give a definition of design policies as the process by which governments translate their political vision into programmes and actions in order to develop national design resources and encourage their effective use in the country.
DeEP defines design policy as "Policies that are aimed at sharing a set of rules, activities, and processes to support design through the reinforcement of design capabilities at all levels of the policy cycle" (DeEP Glossary 2013).

Nowadays, design is recognized as a key driver for innovation. Despite this, the role of design in innovation policies is very fragmented across Europe. Only few governments have developed clear national or regional strategies to include design in innovation policies. 'Innovation analysts and policy makers have, traditionally, paid little attention to design policies and provide little in the way of critical appraisal of policies for design, whether constituted as independent design policies or as part of wider innovation policies. Until very recently the overwhelming focus of innovation policy has been on the role of research and development (R&D) and the public sector science base and, to a lesser extent, technology and engineering policy (…) design has been either absent or a poor 'second cousin' to innovation policy' (Hobday M., Anne Boddington, Andrew Grantham 2012).
On the other hand, it is possible to recognize the effort of all European countries and regions to implement design programs, although often tacitly while others occupy middle position with tacit and explicit design innovation policies. Thus, it is possible to recognize two systems in Europe: one explicit where design innovation policy programs are

acknowledged and one tacit where design innovation can be recognized within more general innovation policies. Both explicit and tacit systems have seldom been evaluated, resulting in the lack of a theoretical framework and of indicators to evaluate the overall impact on socio-economic growth.

Analytically, the design policy debate has been largely instrumental, seeking to support policy makers in the shaping of policies to promote design, rather than asking deeper questions about the validity and the efficacy of policies. Consequently we know little about the 'mental models' (e.g., implicit approaches and assumptions) which underpin design policy making' (Hobday, Boddington & Grantham, 2012, p.272)

Furthermore, the difficulties in evaluating the impact of design innovation policies are compounded by this lack of frameworks. This lack of evaluations can lead to design innovation policies less effective and disconnected from the SMEs' activities; in relation to this specific subject we would underline this lack analysing the relations between design and medium-long firm's performances. Our work aim to answer to this hypothetical linkage that seems to exists in SME's between a deeper "understanding" of design as competitive leverage and a sustainable increases in performances.

2.5.1 Policy evaluation

Policy evaluation is the process of determining quality, goal attainment, program effectiveness, impacts, and costs of a policy. The main goal of evaluation is to determine whether a policy effects are intended or unintended and whether the results are positive or negative for the beneficiary and the society. (Theodoulou, Stella Z and Kofinis, 2004)

Theodoulou, Stella Z and Kofinis describe different perspectives in policy evaluation:

- Evaluation is the assessment of whether a set of activities implemented under a policy has achieved a given set of objectives;
- Evaluation is the effort that renders a judgment about program quality;
- Evaluation is information gathering for the purpose of making decisions about the future of the program;

‘Almost all innovation policy measures, aim at (and are justified by) the ultimate goal of job creation and economic growth. This implies that, in measuring success at a project, company or cluster levels, one must have an idea of how the intervention can in fact contribute to program goals in the selection of projects (ex-ante) and in all implementation phases of the programs (monitoring)’ (Grünfeld et al., 2011). Furthermore, policies need to be evaluated ex-post to understand their results and impact.

Policy Eco-System

‘Political systems are the formal and informal political processes by which decisions are made concerning the use, production and distribution of resources in any given society. Formal political institutions can determine the process for electing leaders; the roles and responsibilities of the executive and legislature; the organisation of political representation (through political parties); and the accountability and oversight of the state. Informal and customary political systems, norms and rules can operate within or alongside these formal political institutions’. (Scott, Z. and Mcloughlin, C., 2012)
The actors, environment(s) and structures required to support design as an enabler of people-cantered innovation at a regional or national level. The eco-system is characterised by the interactions between actors, and between actors and their environment.

Policy effect

Intended or unintended change due directly or indirectly to an intervention. In experimental studies with control group, the effect is the difference between the average result for the so-called treatment group and the average result for the control group (Sida, 2007).

Policy effectiveness

The extent to which the intervention’s objectives are achieved, or are expected to be achieved, taking into account their relative importance.

Effectiveness can be divided into: (i) external effectiveness, the ratio between products (output) and results (outcome), (ii) internal effectiveness, the ratio between products (output) and objectives of the promoters.
The effectiveness of a design policy is measured by the positive change and/or transformation in the stock of design capabilities observed in design policies beneficiaries.

Policy efficiency

A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results (Sida, 2007). Efficiency evaluation at the end of the policy consists in an assessment of the actual costs sustained. This activity allows providing an evaluation regarding the adherence of the expenditure to the planned budget and allocation. The results from these analyses can be used to revise or improve similar policies or new editions of the policy itself in the future.

2.6 Indicators Theory

Indicators are tools to show and measure the performance of a phenomenon considered representative for the analysis. Indicators are also used to monitor or evaluate the degree of success and adequacy of activities implemented during a process.
An indicator is a summary measure, usually expressed in quantitative form, coinciding with a variable or composed of several variables, able to summarize the progress of the phenomenon reported. *"You cannot manage what you cannot measure"* (Kaplan, Norton, 1992).
In policy contexts, an indicator is a synthetic and representative reflection of a greater, more complex sum of phenomena, preferably made measurable on a quantitative scale (OECD, 1998).
Indicators are quantitative or qualitative factors or variables that provide a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor (OECD, 2002).

‘The success of current and future integrated policy can be judged only by identifying the key indicators that can be recorded and compared to political objectives (the so-called benchmarking or comparative analysis)’ (Jiménez-Beltrán D., 2000).

2.6.1. Indicators use

Communication is the main function of an indicator; in fact it should facilitate the acquisition and exchange of information between the different parties involved in the decision-making process and / or between the participating entities and end users that do not directly participate. Indicators are needed to:

1. Provide information about the problems, in order to place the policy-makers in a position to carry out their tasks of evaluation;
2. Support the formation of policies, identifying the key factors that generate success or are critical for the policy;
3. Monitor the effects of such policies proposed and implemented, in order to intervene and correct, integrate, expand, etc.;
4. Monitor the evolving and transforming reality, to be ready to provide new answers.

In policy contexts, indicators can inform decision-making in the policy making process, while performing different roles:

i. Conceptual use, indicators can be used as a tool to illustrate concepts, helping to change the understanding of an issue
ii. Instrumental use, they can disclose a direct relationship between indicators and decision outcomes. For example, they can be used to measure the impact of certain decisions, and when used to measure effectiveness, they can be instrumental in changing policies (Hezri A. A., 2003).

2.6.2. Indicators categorization

The two main dimensions of indicators’ evaluation are effectiveness and efficiency:

1. Effectiveness can be mainly divided into:
   1.1 External effectiveness, defined as the ratio between products (output) and results (outcome)

1.2 Internal effectiveness, defined as the ratio between products (output) and objectives of the promoters

2. The efficiency is the relationship between resources used (input) and products (output), its evaluation involves the analysis of the technical and production process and the management of production's factors

In addition, an indicator can be labelled as:

1. Descriptive indicator, expressed by absolute or relative sizes, and mainly used to characterize the environmental conditions and the monitoring of the planning process in question;
2. Performance indicator, which is used to measure the degree of achievement of sustainability in absolute terms (efficacy) or in relation to the resources used (efficiency); they are usually associated with a target reference term.

2.6.3. Indicators classification

Indicators can be classified according to their nature into three main categories (Azzone G. et al., 2006):

1. Accounting indicators;
2. Value Based Indicators;
3. Non-financial indicators.

Accounting indicators

Accounting indicators are performance indicators that are constructed from the information contained in the financial statements of a company. Can be characterized along two main axes:

- Indicators that express the profit margin of the company, or measure the absolute value of the assets created
- Indicators that refer profit (economic logic-sheet), or referring to cash flow (financial logic)

The main summary indicators of the profitability of a company are for instance:

a. ROE = Net profit / Equity
b. ROI = Operating income / Balance sheet assets

Limitations of accounting indicators:

- Reduced time perspective
- Exclusively short term oriented, are more the result of past actions of the company that an estimation of its future possibilities

Strengths of accounting indicators:

- Completeness, since the ROE and ROI are an accurate measurement for a single year, its completeness must be understood as the ability to synthesize the various contributions to the creation of economic value for a single year
- Good measurability, since their detection is governed by specific rules. In fact, the margins of arbitrariness exist (e.g. in determining depreciation and appreciation of stores) but are not particularly relevant as long as uniform conventions are adopted for the different units in which a company is organized and also in the presence of changes in the fiscal policies of enterprises, they become homogeneous data for different exercises

These synthetic indications say that the use of indicators within the accounting system of management control should normally be limited to firms operating in stable contexts where the short-term profitability in itself may be an indicator of competitiveness of an enterprise. In dynamic contexts, however, the correlation between past and future performance certainly looks weaker; in addition, when the context becomes more and more dynamic, the timeliness of information becomes a critical factor.

Value Based Indicators

The VBM (Value Based Management) indicators aim to monitor the development of the company or one of its units through the accurate measurement of economic value creation. They are based on the estimation of cash flow exchanged between the company's

shareholders in the long run, thus involving an integrated analysis tool to assess the different competitive potential, to create economic value for a business, and financial analysis. The principle behind these indicators is that the performance of the company should be measured by the creation of value for shareholders.
The characteristic VB indicators answer to the need to estimate the actually performance of the company in the medium to long term. They must therefore be able to integrate two different analyses:

- The analysis of competitiveness, through which to plan the evolution of the positioning of a company over time
- Financial analysis, which is to translate the strategic considerations in an estimation of the evolution of the financial statements of an enterprise over time

Operationally, the process is divided into four phases:

1. Performance tree;
2. Competitive Analysis;
3. Estimate the Net Cash Flow;
4. Estimate the final value.

The value-based management approach investigates the explicit objective of creating superior long-term value for shareholders. In general the goal of control systems is to promote congruence between the actions taken by the agent and the actions desired by the principal. The value-based management process goes a step further by focusing on the identification of ‘‘value drivers’’ that lead to increased shareholder value (Ittner C. D., Larcker F. D., 2001).
In this report we will proceed and consider this type of indicators as strongly linked to enterprises capabilities and skills.

Non-financial Indicators

The non-financial indicators refer to measures of quantitative and non-monetary dimensions such as market share.

The non-financial indicators can be divided into two categories, which correspond to two different components of the economic value's creation:

1. Indicators of current performance of the company, which detect the "quality" of the current projects of the company;
2. Indicators of the state of resources, which measure the potential of the resources available to the enterprise to generate projects of "quality" in the future.

Indicators of current performance of the company can be classified under two main dimensions, concerning:

1. Competitive factors (time, quality, flexibility, productivity, environment and society);
2. Type of competitive advantage measured (distinguishing between the indicators covering the performance of the company in relation to customers and measures indicative of how the resource management is performed within the enterprise).

The main advantage of non-financial indicators than accounting and VB is the timeliness. While in the case of the latter is necessary to translate the physical transactions in economic terms, it is possible to calculate the non-financial indicators based solely on physical transactions.

2.6.4. Indicators requirements

Indicators, in order to be the relevant measure they are constructed to be, they must fulfil certain requirements. Criteria are analysed in order to understand if an indicator can be relevant or not:

i. Validity: indicators should actually measure what they are presumed to measure
ii. Controllability: indicators must relate to aspects that are under the effective control of those who govern the policy in question
iii. Comprehension: indicators must be understandable to those who need to use
iv. Uniqueness: each indicator must be specific to an aspect that no other indicator detects
v. Timeliness: the information needed must be available in time

vi. Comparability: a comparison must be possible over time and / or in space (cross section)

vii. Cost: the benefits provided by the indicators must be higher than the cost of collecting them

In 2000, the New Economics Foundation identified the AIMS criteria for indicators that continue to be a useful guide in deciding if an indicator is a good indicator:

Action Focused	Indicators should lead to action, if it is not clear what to do with the data from an indicator, then it probably is not a good indicator
Important	All relevant actors should agree that the indicator and the data it will generate make a relevant and significant contribution to evaluating the policy impact
Measurable	Not only should the data collection methodology be defined, it should also be feasible to collect the data
Simple	There are very few indicators, if any, that are perfect. Rather than pursue the perfect indicator, it is much better to identify good, simple indicators that provide data that can be put to use

Table 4 Indicators AIMS criteria

2.6.5. Dashboard indicators

Table 5 summarizes the performance of the three categories of indicators usable within the control system management. The table shows that no solution is optimal with respect to all the criteria that should characterize a good control system management; however, for each of the criteria there is at least one family of measures completely adequate.

Performance	Accounting indicators	VB indicators	Non-financial indicators
Entirety	Fair good	High	Depends on the chosen set of indicators

Measurability	Fair good	Low	High
Long-term orientation	Low	High	Intermediate
Accuracy	Intermediate	High	Low
Identification of specific responsibilities	Depends on the specific indicator adopted and the detection mode	Good if it is referred to high levels of the enterprises	Good, especially at the operational level
Timeliness	Low	Poor	High

Table 5 Indicators performance of the different classes (Azzone, 2006)

This consideration has led many companies to construct "dashboard indicators", or groups of different types of measures that together can meet all the needs of managerial control. This naturally requires the dashboards to contain a set of indicators consistent with the competitive position of the individual firm and the specificities of each organizational unit. The correlation between the adoption of dashboards and the creation of economic value for shareholders is of course not easy to estimate. However, the first empirical test shows that the use of a dashboard of indicators is positively associated with the creation of value (Evans R.E., 2004), in particular when the dashboard includes an integrated system of indicators consistent with the business strategy (Davis S. and Albright T., 2004). In general the adoption of a dashboard of indicators involves:

1. The definition of the format of the dashboard, or the way in which the indicators are organized
2. The definition of the process through which you can select the specific measures

2.6.6. Main Models

There are different models of dashboard indicators. In particular the most diffused are:

1. Balanced Scorecard (BSC);
2. Critical Success Factors (CSF), used to define the critical areas of business and defining strategic indicators;

3. Key Performance Indicators (KPIs), to identify critical performance of business processes, oriented to operational control;
4. Management Accounting, to build the infrastructure of economic indicators and balance sheet for directional control.

While the **Management Accounting** model is mainly based on the accounting indicators previously described, the other models introduce also some other specificities as described in the following.

The **Critical Success Factors** model refers to the areas of excellence that can be defined as "those crucial areas where the company has to work perfectly to succeed in business.

Being areas of excellence, the CSF may differ from business objectives and indicate the areas where you need to excel in order to achieve the desired results for each objective.

In this sense, the CSF can be considered as "means" to reach the "ends" defined objectives.

Key Performance Indicators model, qualitative and quantitative, are focused primarily on processes, which measures business results with reference to key aspects such as:

i. Achievement of a certain share of the market
ii. Achievement of a certain quality standard
iii. Performance efficiency
iv. Level of service
v. Degree of customer loyalty in purchasing

From KPI's point of view, the process management is a series of activities that, using a set of resources produces an output in response to service requests. The objective is therefore to measure the full range of performance of a process, which together must quantify the value of the output of the process for the customer.

Balanced Scorecard

Among the various methods to build a dashboard of indicators, the Balanced Scorecard (Kaplan and Norton, 1992) is the most common, so that often in practice the term Balanced Scorecard is made to coincide with the term dashboard of indicators.

The Balanced Scorecard provides that each organizational unit is associated with four groups of indicators, related to:

- The financial performance
- The customer management
- The internal perspective
- The innovativeness, defined initially as innovation and learning, or learning and growth

The Balanced Scorecard (Figure 6) provides a good "covering" of indicators that explain the creation of economic value of a business. In particular:

- The quantities relating to the financial perspective corresponding to measures of economic, financial and synthetic indicators are the results of the company and / or the individual organizational unit
- The customer-related perspective corresponds to the performance indicators "customer-oriented" (e.g. percentage of sales in new products, on-time delivery etc.)
- Measures based on the internal perspective correspond to performance indicators oriented "inside" (e.g. the average production cost, cycle time, waste etc.)
- The indicators of innovative measures include the "state" of the firm's resources (such as time to market, the average time between two versions of a product, etc.)

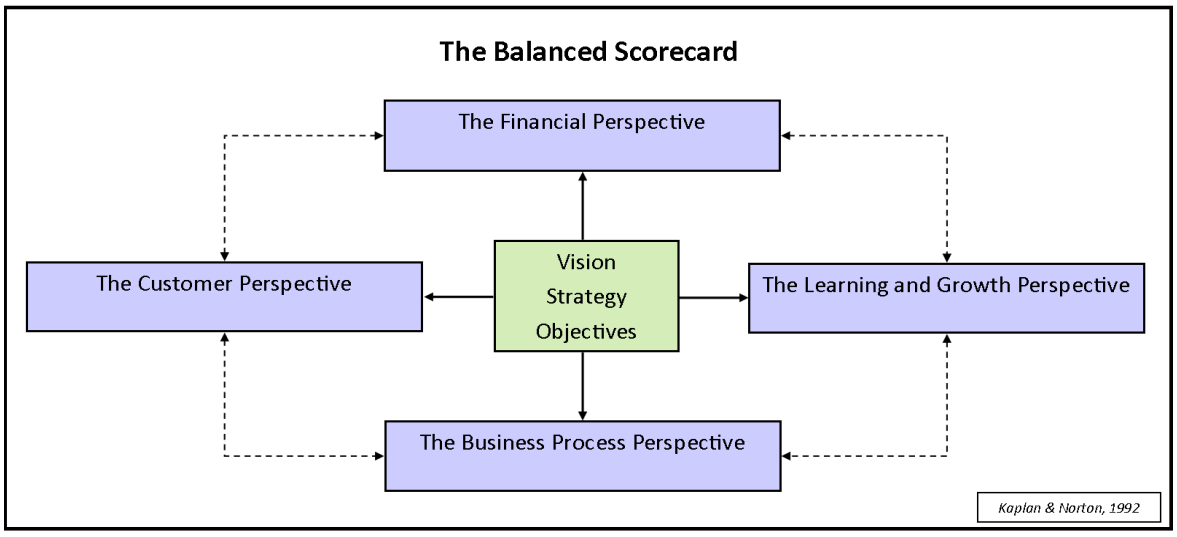

Figure 7 Balance Scorecard framework Kaplan & Norton 1992

2.6.7. Design Indicators

Indicators connected with the design fields are those used for R&D policies. These are mainly described in the "Frascati Manual", and are based on statistical data and calculations to obtain a large set of indicators that capture different dimensions for example, the European Innovation Scoreboard measures innovativeness using different indicators.
In the Innovation index promoted by Nesta design is considered a category of investment. These investments may be critical in the innovation process, as they play an important role in new product and service development. The category also includes those investments aimed at developing new services and financial products (Nesta 2009).

A document where indicators are focused on design is the International Design Scoreboard: Initial indicators of international design capabilities (Moultrie J., Livesey M. 2009). This defines a framework for ranking nations that considers different indicators as illustrated in the table below.

Definitions of indicators used in the International Design Scoreboard		
Absolute measure	**Relative measure**	**Comments/Issues**
Total public investment in design promotion and support	Public investment in design promotion and support as a percentage of GDP	- Government investment and not investment from the private sector - Difficulties arise in capturing all investment, when it is spent on diverse initiatives and also in the different regions of a nation - Thus, this value includes only investment in recognized national bodies
Total number of design graduates	Number of design graduates per million population	- Subjects include: graphic/communication design, interior design, industrial/product

		design, digital/web/media design, fashion design
Total number of WIPO design registrations	WIPO design registrations per million population	- Although WIPO is only one route for design registration, it indicates an intention to trade internationally, and is thus a valid source of comparison
Total number of WIPO trademark registrations	WIPO trademark registrations per million population	- Although WIPO is only one route for trademark registration, it is indicative of an intention to trade internationally, and is thus a valid source of comparison
Total number of design firms	Number of design firms per million population	- Design subjects include: graphic/communication design, interior design, industrial/product design, digital/web/media design, fashion design
Total turnover of the design services sector	Turnover of the design services sector as a percentage of GDP	- Employment should include all employees, not just those engaged in design
Total employment in the design services	Employment in the design services sector per million population	

Table 6 International Design Scoreboard – set of indicators

2.6.8. Innovation Evaluation

Speaking of innovation evaluation we touch a very complex subject because the potential bases for evaluation are huge and innovation is a broad subject to map and investigate. We often hear the word ‘measure’ in the context of innovation evaluations because to assess something the evaluator has to be able measuring the variables under analysis. The lack of

known and absolute reference points in the field of innovation does though mean that word measure often is used synonymously with assess (Karlsson H., 2013). As Chiesa V. et al explain, most commonly used are innovation audits that differ from measurements since audits not only measure but also can be used to identify gaps between current and desired state, and does thereby provide information that can be used to formulate action plans (Chiesa V. Coughlan P, Voss C.A, 1996).

Measurement scope varies within the definition of innovation between different models but independently of scope, the most common is to use a best practice based audit (Karlsson H., 2013). These audits often have a structure that starts in an overall scope and then branches into measurement areas that represent areas considered to be important or critical to innovation. A schematic example is presented below:

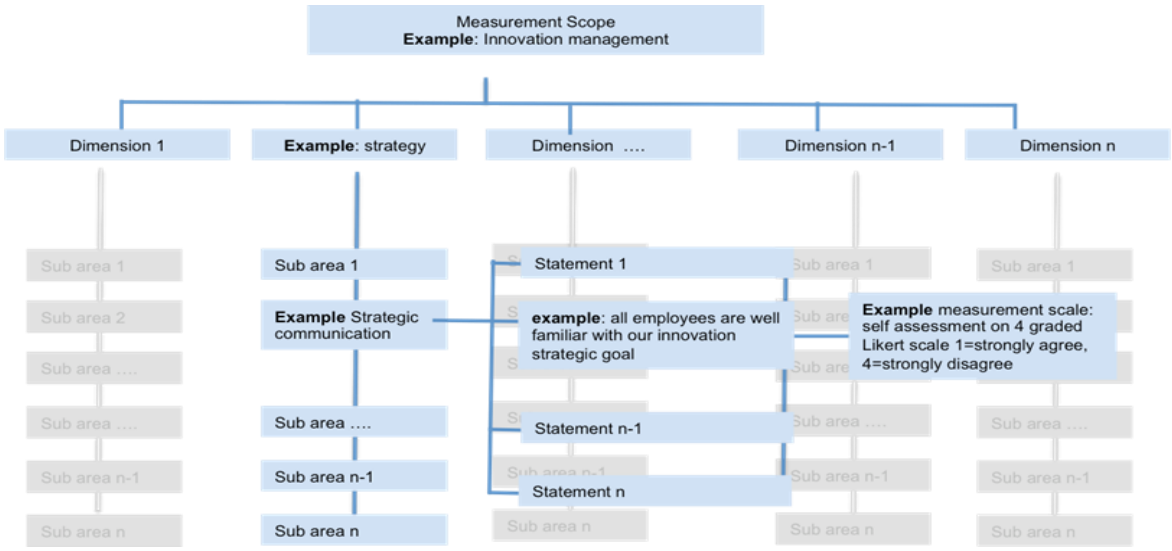

Figure 8 Example of Measurement Scope, (Chiesa V. 1996, Cormican 2004)

In the reported study Chiesa V. et al continue explaining that even if the structure could seems very similar between different auditing tools; evaluation scope and dimensions differ between them. Evaluation scope is sometimes delimited to a specific category of innovation like e.g. technical innovation and NPD processes (Chiesa V. Coughlan P, Voss C.A 1996), or a more comprehensive scope like innovation capability and innovation management (Nilsson et al, 2010; Tidd J. and Bessant J., 2009; Biloslavo R., 2005).

Many models exist and the field is often criticized for being fragmented (Björkdahl and Holmén, 2012; Adams, R., J. Bessant, et al, 2006). Karlsson H. developed a simple

framework within which the measurement is brought to light through three steps where the evaluator has to decide: *what to measure, how to measure* and *what to refer to*. We report it below.

What to measure

According to the Karlsson framework in terms of *what to measure*, measures of input and output indicate rather than explain performance why one also has to look at the capabilities and the processes for development and exploitation if one wants to gain a more profound understanding of the performances of innovation (Chiesa V. Coughlan P, Voss C.A 1996). This suggest that a good evaluation system have to overshoot the mere measuring of the output achieved and try to open the black box of the firms' improving process assessing causality to the phenomena. Within this box we should understand how input, output and capabilities improving work. As reported from Karlsson H., critique is that models have originated from a technological context and that there is an over-reliance on financial measures rather than process measures (Björkdahl and Holmén, 2012; Adams et al, 2006; Chiesa V. Coughlan P, Voss C.A 1996).

Starting from the innovation input, the framework proposed by Karlsson explains that different kinds of innovation and different stages of the innovation process require different input resourcing the innovation activities. She goes on classifying innovation input as the input in itself in terms of e.g. ideas, the amount or quality of something but also on the capability to attain, extract and produce the input needed. Input could be both monetary and non-monetary in terms of monetary measureable assets like e.g. budget or in relative terms of e.g. capabilities or routines to generate input, ideas and concepts' (Karlsson H., 2013).

As the result of the process innovation output could be both the direct output of firms' innovative works in terms of e.g. new products or patents and the more indirect effects (outcomes) of these in terms of e.g. increases in revenue and new capabilities.

Improving innovation Capabilities is "the ability of a subject to do something", the power or ability to generate an outcome. Ability is the suitableness, a skill, talent or competence. Innovation capabilities are strictly related to the competence of a subject to implement something new or significantly improved (Karlsson H., 2013). Since the geographical and

organizational sources of innovation is widely dispersed in a fast-moving business environment innovation capabilities too needs to be dynamic in order to maintain a sustainable advantage. Dynamic capabilities are the tangible and intangible assets, and the knowledge and processes needed for seeing new business opportunities and coordinating changes (Teece et al, 1997). Dynamic Capabilities needs to stretch over the entire process of innovation, from input throughout the entire production of innovative outcomes, covering all the innovation activities required and finally capturing the values of innovation and innovation activities (Karlsson H., 2013). Measures of dynamic innovation capabilities do not have to be done separately but can be seen as a dimension of all measurement areas if e.g. the following dimensions of dynamic capability suggested by Teece (Teece D.J., 2011) are taken into consideration:

1) To sense and shape opportunities and threats;
2) To seize opportunities;
3) To maintain competitiveness through enhancing, combining and when necessary reconfiguring both tangible and intangible assets of the firm.

How to measure and what to refer to

After having set up the object of the measurement, the evaluator have to interpret and understand the data collected. Understanding *how to measure* is strictly linked to what the evaluator have to compare with. Principally talking about *what to refer* Karlsson illustrates that when innovation is audited, the audited firm is usually compared against known best practices (Tidd J. and Bessant J., 2009; Cormican, 2004; Radnor and Noke, 2002; Chiesa V. Coughlan P, Voss C.A 1996). Best practices are always based on what happened in the past why their value and use have been questioned for what is radically different from a) what others do, and b) what has already been done (Sniukas, 2010; Hamel and Pralahad, 1996).

The measurement process is often done by the use of different kind of indicators formed as statements or questions. As an indicator should be a simplified representation of a more complex reality (DeEP Glossary) it is important that it actually reflects the phenomena that is to be evaluated and formulated in a way that provides the sought information and insights needed (Karlsson H., 2013). Indicators used are most often in the form of pre-

formulated statements but in some models are developed by participants from the audited firm (Björkdahl and Holmén, 2012; Nilsson et al, 2010, Chiesa V. Coughlan P, Voss C.A 1996).

There is a continuous development of best practice in the field. Chiesa V. et al refer to this as an explanation of why firms chose to modify or add elements in the audits used (Chiesa V. Coughlan P, Voss C.A 1996). There is also a constantly on-going increase in understanding and knowledge of what practices are best for innovation (Karlsson H., 2013).

2.6.8.1 How to Measure the Effectiveness of the Innovation Process

As Langdon Morris reports in one of his last publication, the pursuit of innovation as a manageable discipline has been practiced for only the last couple of hundred years; systematic research and development began in the chemical industry in the 1850s, a mere 160 years ago. Progress in any field requires the development of a framework, a structure that organizes the accumulating knowledge, enables people to master it, and unifies the key discoveries into a set of principles that makes them understandable and actionable (Langdon Morris, 2011 The innovation master plan).

Firms' effectiveness of the innovation process must be able to be measured in order to be managed in a timely manner. The need to evaluate the results achieved is not newness; nonetheless, it has always been a challenging assignment measuring the right aspects of innovation, because measuring in the wrong way can have negative effects on the process itself. In addition to this before selecting the right metrics, the evaluator should be clear about the aims of the assessment.

One of the main features of the Innovation is the uncertainty of itself and the difficulty of defining what is innovation and what not. As Langdon Morris explains in *The Innovation Master Plan*, chapter 6: innovation metrics: '(…) One reason is that the pursuit of innovation necessarily involves a venture into the unknown, and if we try to pin these unknowns down too early in our process we may make it more difficult to recognize and realize good opportunities or solutions'.

As reported by Langdon Morris: 'Process-oriented metrics typically consider the means, such as the number of new ideas proposed or new ideas introduced. They also consider

organizational outcomes such as increased capabilities with existing or new technologies, which makes them potentially useful as indicators. Financial metrics are focused on ends, the results, and include ROI-based models to track financial performance, or the proportion of sales or profits from new products'.

2.6.8.2 ROI-based assessment

As innovation is with no doubt a form of investment that should be measured, different measurement systems and metrics were examined. In the evaluation process ROI is a natural part of the innovation discussion, but it does present certain problems that we have to be aware of.

Known the role played by the ROI in the measuring instruments, Langdon Morris performs relatively to the actual practical use of this indicator, to be more precise:

'ROI discussions make a lot of sense when we're evaluating incremental ideas that will be applied in existing, well-understood markets, using existing, well understood business processes such as established manufacturing and distribution systems. But when we consider ideas that are not incremental, and when they are in the early stages of development, a huge danger suddenly appears, because ascertaining ROI early on drives us to try to assess what the completed innovation could return to us when we're unlikely to have a realistic idea of what its worth could really be'.

As Morris explains this is a contradiction that drives us toward incrementalism even when an idea has the potential for a radical innovation.

Because of all these mentioned factors, the main weakness of ROI-based assessments is that it tends to favour short term thinking instead of the development of long term and breakthrough projects (Langdon Morris 2011).

2.6.8.3 The Innovation Master Plan Framework by Langdon Morris

After describing the complexity of the innovation's assessment and the different evaluation systems, we would like to propose the powerful framework proposed by Langdon Morris that found a way for thinking about innovation. He called it the 'Innovation Master Plan' that will be obtained by the evaluators asking five questions we report.

First of all according to the framework the evaluator should know the reason why to innovate, consequently the first question will be ***'Why innovate?'*** and this quite simple question leads the evaluator to examine the strategic nature of innovation. Nowadays innovation is a strategic requirement for every company because it influences the organization survives, and we know that any firms that does not innovate probably will not stay in business in the early future. After that consideration, the innovation process could not be misaligned with the firm's strategy so innovation will be a manageable tool that defines how the strategy will be performed.

The second question will concern the object of the innovation. In this meaning the evaluator for his purpose should ask ***'What to innovate?'***. Morris talks about an innovation portfolio saying that '(…) we recognize that the unpredictable nature of change requires us to prepare many innovation options for a wide range of possible futures. These options constitute an investment portfolio. As with any portfolio, some projects will do well, while others will not. In the case of the innovation portfolio, the disparity between success and failure will be very wide'.

Third question will be *'**How to innovate?'*** that is one of the most critical point and for this significant magnitude a rigorous innovation process is necessary. As we said above the process must be driven by strategic intent (the "why" of innovation) therefore the innovation process proposed by Morris starts with strategy.

Other important question should not be underestimated concern the actors of the innovation process so ***'Who innovates?'*** will be the following question. Morris state that 'while everyone participates in a robust innovation culture, there are three distinct roles to be played in achieving broad and consistent innovation results. These roles are *Innovation Leaders*, who set policies, expectations, goals, and the tone for the innovation culture; *Innovation Geniuses*, who come up with great ideas and insights; and *Innovation Champions*, who organize the pursuit of innovation and support those who develop great ideas and turn them into business value'.

Talking about the tools and infrastructure that support the innovation process we will come out with the ***'Where?'*** of the innovation process. According to Morris there are four main elements of this infrastructure: *open innovation approaches* that engage a wide community in the innovation process; the second one is the *virtual infrastructure* that nowadays is not discretionary because it supports effective remote communication and collaboration; the

physical infrastructure; and the *collaborative methods* that able to bring the best ideas from all actors inside and outside the organization.
A last point of this framework is the sixth question ***'When?'*** to innovate. That refers to the complexity of this topic especially if firms understand that change is accelerating and if they know how important it is to develop the innovation mind set within the organization. Morris top off declaring that in this innovation way of thinking the timing is obviously now.

Measuring the innovation process and its results is a way to assess the value of what has been learned and also to improve the effectiveness of the learning process. Nevertheless, talking about evaluation Morris added: 'Measuring the effectiveness of your innovation process is a lot easier to do when the process itself is mature, and you can look back and see tangible evidence of your accomplishments and failures'. In fact at the early stages, measuring firms' progress will be more difficult because evaluator could not have as much changes to show. He continued saying that '(…) it is of course ironic, because it's in the first years that most people want reassurance that they're doing it well enough to continue with the effort and encouragement that the investment they are making will indeed generate that coveted results'.

After having presented a general overview on literature and the study of correlation between design, innovation and competitive advantage, it is time to go in depth in the central topic of our thesis: how design can affect SME's performances.
We want to investigate the relationship between design investments and firm's increase in performance. Support policies are the perfect example of design investment, below we go in depth in the subject we want to analyse.

2.6.8.4 Innovation indicators

We have clustered these indicators under the three categories: *innovation input*, *innovation capabilities* and *innovation output*. Reason to separate input and output from capabilities is to stress the phases of *pre-production* of innovation, *post-production* of innovation and the *production* of innovation (innovating) (Karlsson H., 2013). The innovating phase does of

course contain so much more than just capabilities. It contains processes, linkages, equipment and much more but to sense threats, seize opportunities and arrange and rearrange all these prerequisites for innovation requires capability to innovate and maintain its innovativeness, why capabilities were chosen as a single cohesive label of the middle part (Karlsson H., 2013).

Innovation Input

These indicators focus both on the input itself in terms of e.g. amount or quality but also on the capability to attain, extract and produce the input needed. Indicators could therefore be both monetary and non-monetary in terms of monetary measureable assets like e.g. budget spent or in relative terms of e.g. capabilities or routines to generate input, ideas and concepts (Karlsson H., 2013).

Innovation Capabilities

About this typology of indicators, in her work Karlsson provides a large contribution on them. She affirm that indicators of innovation capabilities focus on how the firm:

1. Sense and shape opportunities and threats;
2. Seize opportunities;
3. Maintain competitiveness through enhancing, combining and when necessary reconfiguring both tangible and intangible assets of the firm.

Starting from Karlsson's work, we have taken into account four types of innovation capabilities indicators:

1. *Strategy indicators*: these indicators give a holistic perspective and are important considering how firms are strategically handling innovation to support overall business purpose. The evaluator may use this kind of indicators to match innovation processes with the overall strategy of the firm and to analyse how innovation is managed and planned for in both long and short-term perspective;
2. *Knowledge Management indicators*: these indicators were chosen because exist a link between innovation influence and how knowledge is properly managed. They

help to analyse both the knowledge and the processes for knowledge. This kind of indicators address e.g. how the firm builds, spread and access knowledge within and outside the organization and the match between knowledge and future needs to remain innovativeness over time (Karlsson H., 2013);

3. *Organization and Culture indicators*: these indicators were included because we have found a link between innovation influence and firms' organization and culture;
4. *Project Management indicators:* these indicators help firms analysing the content and the deployment of the innovation process e.g. tools and methods used in the process, multidisciplinary represented by the participants in innovation projects, methods for selection and termination of projects (Karlsson H., 2013).

Innovation Output

These type of indicators helps to analyse both the direct output and the outcomes of a firm's innovative work in terms of e.g. new products, patents or processes and their impact on revenue and market shares. But also the firms capability to capture the more indirect values like e.g. increased motivation, capability to absorb and incorporate new experiences also from non-successful innovation projects (Karlsson H., 2013).

3. Methodology and data

As we illustrated in the literature chapter, many scholars have investigated design topics and their impacts on firms' capabilities and performances. Our main objective is to go in depth and understand what the effects of design investments are and how these can boost performance in firms, particularly in SME's. In the following chapter, we present the methodology we used in the project related to our subject through a comparison between the different European policies.

The development of the DeEP project was carried out by different partners, including Politecnico di Milano, through the study and analysis at national level of DIPI (Design Innovation Policy Initiatives) for each participating country. As mentioned before Politecnico di Milano has chosen to evaluate as target-policy the initiative promoted in the Milan area by the Chamber of Commerce known as 'Un designer per le imprese'.
To understand how our research was structured we will illustrate the process adopted in order to analyse the chosen policy. We decided to start interviewing policy maker with the aim to understand the policy process and to be aware of the objectives they pursued by providing the programme. We then proceeded with the firms' interviews, which were the central part of our analysis. We tried to understand if the target companies have obtained or not some positive impacts investing in design practices through the participation in the policy and how we could interpret and measure those improvements.

Our collaboration started in October 2012 and was carried out within the Department of Management Engineering (DIG) of Politecnico di Milano. During the months of November, December and January the various interviews conducted on both the beneficiaries of the policy (enterprises) and the promoters and organizers of the initiative (policy makers), played a leading role. During the research we produced eight case reports some of which are attached in the annex section, and we studied the results that the investments in design produced in terms of impacts at firms level (micro level). In the following months, we interacted with a more substantial way with the other university partners of the project, so it was possible to carry out an exchange of information and documentation collected during the previous months in a strategic cross-country analysis of the various local initiatives. At the same time, our research has gone into the

construction of a panel of micro indicators at firm level. Between April, May and June, through several meetings with the other institutions we managed the realization of the panels of indicators at both micro and macro level. In fact, the main role of Politecnico di Milano was to build a system for design investments evaluation at firm's level, through the construction of a set of indicators, which will be, together with all the output produced in the research, part of the **DeEP Evaluation Tool.** The role of this tool is to include and transform the outputs into useful tools in support of both policy makers and beneficiaries.

During the research we have developed two questionnaire for the interviews carried out. We prepared one for each typology of interviews in order to investigate the output of the policy from two different points of view:

1) Policy makers' interview protocol;
2) Beneficiaries' interview protocol.

The policy makers' interview protocol was designed in order to address the following goals:

a) Policy makers' objectives to be expected by the initiative;
b) The general process of the policy and how it works;
c) Finally, the results policy maker had collected thanks to the firms' feedbacks and surveys.

Regarding instead the beneficiaries' interview protocol, the aim of the questionnaire was slightly different: we wanted to understand and evaluate the following topics:

a) What they did during the project and who were the relevant actors;
b) The type of support they received (financial or not financial);
c) Moreover, the most important aspect how they evaluate the participation to the policy after its end and what it brought into the enterprise's processes and capabilities.

3.1 What we investigated: two hypothesis

After having briefly presented what was the structure of the DeEP project, in this chapter, we want to clarify what has been the field of research in which we moved, at the base of our interpretation, regarding the linkage between investment in design and performances improving.

Our assessment tries to answer two assumptions that we have examined in the course of the analysis, both came out from what is until not properly clear from the literature:

1. Investing in design means investing in innovation, design is the main driver in innovation competition that allows to gain a sustainable competitive advantage;
2. Design investments impacts take place through five design capabilities, those investments affect firms' performances, increasing and empowering them.

In order to find the two answers we adopted the case studies methodology. We needed to analyse those firms that had substantially invested in design so we could prove with both an empirical and a quantitative analysis, how the investment in design had an impact on the overall companies and how the design awareness changed the process and the strategies of the firms that invested in. For this reason we have asked feedbacks from participants of the design policies (Italy and Europe) on how the innovation process changed after the design investment.

Beneficiaries Firms	Founded	Country	Industry	Employees (2011)	Markets presence
A4Adesign	2002	Italy	Furniture design	6	Europe
Amica Wronki S.A.	1957	Poland	Electrical appliance	1800	Europe
Arcoma	1990	Sweden	Medical furniture	58	Worldwide
Asimpex	1985	Poland	Pharmacies furniture	60	Worldwide
Camp Scandinavia	1952	Sweden	Orthopaedic rehabilitation products	190	Worldwide

Challs International	1990	UK	Cleaning products	20	Worldwide
Engineering Company (anonymous)	1985	UK	Design and manufactures	20	N/A
LEONE 1947	1947	Italy	Boxing apparel	14	Worldwide
Marmorin	1985	Poland	Marble manufactures	240	Worldwide
Merli Marmi	N/A	Italy	Marble design products	5	Italy
Mode:lina	2009	Poland	Design products and accessories	5	Poland
MomoDesign	1981	Italy	Accessories and clothing	12	Europe
Naylor Industries	1890	UK	Manufacturer of building & construction products	N/A	UK
Owlstone	2004	UK	Nanotechnology	N/A	Worldwide
Perimed	1981	Sweden	Micro vascular furniture	43	Worldwide
Permobil	1967	Sweden	Electric wheelchairs	191	Worldwide
Sonnomedica	2006	Italy	Sleep Medicine furniture	6	Italy
Soul and Mind	1992	Poland	Design services	35	Poland
Tucano Urbano	1999	Italy	Bike clothing and accessories	30	Europe

Table 7 Beneficiaries firms' data

Name of the Policy	Policy typology	Country	Target Editon	Beneficiaries	Budget [K€/year]
Un designer	Targeted to design	Italy	2011	+50	120

per le imprese	(access capabilities)				
Design som Utvecklingskraft	Targeted to design (enterprise capabilities)	Sweden	2011	+450	1.900
Designing Demand	Targeted to design (enterprise capabilities)	UK	2011	+700	1.520
Design Your Profit	Targeted to design (access capabilities)	Poland	2011	+600	5.288

Table 8 Design policies' data

Through a data elaboration of the case studies, we gathered quantitative tools to state the changes in design capabilities and the improvement in performance. Related to our second assumption, we introduced the term "Absorption", which can be defined as the empowerment of the target firm's design capabilities due to partial retention of the results achieved by the investment in design. The design capabilities selected and described in chapter 2.3.1, are those factors that affect and influence the enterprise ability in understanding and using design as a central enabler of innovation and competitive advantages. They rely to the firm's interpretation of users' needs and trends in terms of creation of new meanings and new experiences that could result in breakthrough products and services respect the mainstream paradigm and could permit to gain a sustainable competitive advantage against competitors.

Our research aims to analyse particularly these aspects, or better the relation between investment in design through the policy participation and enterprises' capabilities improvement. We understood a better way to describe and interpret those improvement constructing indicators and models able to measure the eventual empowerment of design capabilities and the magnitude of the "Absorption" of knowledge and practices the firm was able to do.

3.2 Design Policy in the Italian context

Before starting our assessment evaluation it has to be clear what has been and continues to be the design role in Italy, mainly in Lombardy and the Milan area, and the reason why we have chosen the Italian design policy 'Un designer per le imprese' as case study for our analysis.

Italian design has represented a unique phenomenon at international level, unique strength and, above all, it was stated independently without the injection of public funds. A robust phenomenon based on solid local capacities through which many entrepreneurs have made their business. In that scenario it is therefore natural to think that design is a possible way out compared to the current difficulties; the only way to compete globally is to focus on innovation and to interpret design as one of the drivers for innovation. Strategic design use contribute to innovate products, services and business models, to create new competitive advantage, to support the economic development of local networks.

Many observers, especially local ones, believe that design can be a potential factor to overcome the gap between Italian manufacturers and competitors with low-cost labour.

Design has a fundamental role in the Italian production system and contributes significantly to support it on international markets. It is an essential aspect of the region Lombardy and has been for at least fifty years, not surprisingly then, not only reputable figures from the international design, but also droves of young talents arrive in Italy, especially in Milan daily. From all over the world, they come to join in an exchange of ideas and become part of that hotbed of innovation from which sprouts the typical "Milan way" of designing.

The alliance with the territory is one of the factors of primary importance that explains the success of Milanese design: in Milan there are universities faculties and various training institutes dedicated to design, as well as the headquarters of firms, professional associations and services related to this sector. All those have generated an area that is the cradle of creativity and creation skills, giving life to a highly competitive offer at local and international level.

Nowadays, Milan boasts close-knit relations with a number of national and international firms, which regularly organize feedback occasions, visibility events, shows and displays in their hometown, generally making use of the city's own easily available design resources. Firms are also looking increasingly favourably on the role of design and Milan

nowadays entertains relations with the world's manufacturing capitals and design culture in general. Milan is a design brand in itself and one that must maintain its supremacy, forcing itself to invent continuously new forms of knowledge on design, experimentation and ideas, as well as form and style codes, anticipating trends in use behaviours and consumption models at the same time.

In this meaning, design is destined to make the difference in the future, becoming a major competitive edge for the region, Italy and Europe as a whole. Economic globalization will not allow Italian firms to manufacturer mass-produced, low added value goods successfully, forcing them instead to excel in the production of very high added-value goods that offer a fusion of creativity, innovation and almost craftsman like qualities.

The reality of today's is that the Italian SMEs are living and will experience more and more a reality that is very different from the socio-economic context of the year's 80'-90' characterized by the greatest prosperity and development. Micro-small Italian companies are experiencing the decline of their business due to the difficulty of operating in global markets. This is confirmed by Roberto Calugi, enterprise development area Manager of CCIAA: *"The real problem for enterprises and all the productive system is that Italian competitiveness in the last 60 years was made by wrong choices: till 1960s/1970s we grew thanks to the low labour cost, we were the "China of Europe"; then we used the currency depreciation, and doped the market with fiscal policies. Now the only strategy we can adopt is focusing on competitiveness; that is why all the policies we build must be focused on that goal: make our firms as competitive as possible. Design is one of the most important drivers in this view; Milan is a city that has 'breathed' design for more than 50 years, applied in every industry, in each sector of the business. One of our objectives with this policy is to maintain the role of design capital that Milan has built in his history, linked to the design competences that Design Schools in the area own as specific knowledge and know-how".*

In this just mentioned frame of Italian design, we want to study the impact of the promoted design policies on the increasing business performances, describing what were the results achieved by various initiatives with their respective strengths and weaknesses.

3.2.1 The Policy: 'Un designer per le imprese'

The policy 'Un designer per le imprese' aims to enable a full and strong perception of the design relevance in the SMEs and wants to enable the use of innovative materials and innovation processes in small and medium-sized firms. It is a project created to encourage dialogue between the business community and young designers; and this is the differential competitive advantage that a proactive approach in the innovation process can provide.
The policy 'Un designer per le imprese' has improved incrementally edition after edition; it can be ascribed to the *best practices* and could be taken as an example. The policy will be expanded and make structural in the following editions, seen the remarkable results achieved with the implementation in the Milan area at first, and then in the reality of Monza e Brianza and Como. The growing interest of major public subjects (e.g. the Municipality of Milan) in the project confirms its effectiveness and underlines the future improvements that institutions can make on it.
It should be noted that there is another significant design policy in Lombardy, a regional initiative called 'Decò Ter'. It focuses on the same topics but has been developed in a conceptually different, if not opposite way. In this policy the company receives a full refund on the cost of designing, prototyping and putting into production new product. It turned in a less effectiveness of the initiative as reported by Emilio Genovesi: *"(...) this kind of mechanism often causes the production of prototypes on which the first not to believe in and not to invest their money on are the entrepreneurs themselves"* explained Emilio Genovesi, Ceo of Material ConneXion. He continued adding: *"(...) for designers the lack of real confrontation with the employer on the ideas that may have a commercial value involves a problem of detachment from reality that cannot be filled"*.

The differences between the two initiatives are highlighted by the enterprise development area Manager of Milan Chamber of Commerce, who explain us how 'Un designer per le imprese' is structured: *"We started to develop the policy focusing on the innovation and design demand expressed by firms, we contacted Design Schools and we tried to involve them into the project to improve and make good use of their knowledge and skills; 'Decò Ter' instead is an education-based policy, that starts from the supply of design and innovation; in my opinion, this is a partial approach, because without commitment enterprises use the support policy just as a funding project"* [Roberto Calugi - CCIAA].

'Un designer per le imprese' is a completely enterprise-centred policy. Calugi in his statement explained the design meaning and value: *"The CCIAA approach to design is not through a cultural or aesthetic view, but more a business-driven approach that focuses on competitive advantages that design could provide to our firms"*. He continued adding: *"We see the design as a competitive driver particularly on the international market"* [Roberto Calugi - CCIAA].

The policy was chosen coherently with the **Targeted to Design** typology and with a focus on Access Capabilities (see table below).

	TARGETED TO DESIGN (for design)	**USING DESIGN (through design)**	**OPPORTUNISTIC (also for design)**
1 ENTERPRISE CAPABILITIES			
2ACCESS CAPABILITIES (COLLABORATION)	Un Designer per le imprese (IT)		
3 ECOSYSTEM CAPABILITIES			

Table 9 Design Policy typologies

The central topic we wanted to address and analyse was the capacity of the policy to transfer knowledge to the beneficiaries firms in terms of design and process skills. Starting from the interviews conducted at the Milan Chamber of Commerce (CCIAA) and Material ConneXion Italy (MC), we can conclude that the objectives to be achieved by the policy were:

1. Allow to develop design capabilities in micro-small business going beyond the known "barriers to innovation";
2. Create a contact between companies and universities; for young designers this has meant the opportunity to practice their knowledge in direct contact with the realities of production, on the other side for the companies it has meant to source original ideas and the availability of new resources devoting them to innovative processes;
3. Support companies in development of new products.

As we already explained this policy was created and promoted adopting the point of view of its manager. To reinforce the concept Roberto Calugi added: "*The role that Milan plays as a design HUB in the national and European context is a primary asset for the area and its enterprises"*.

The participation in the policy of Material ConneXion Italy was required by CCIAA that looked it as a "knowledge owner" in innovative materials and their use. The Chamber perceived the potential of this knowledge and decided to build with them a project focused on local firms and their capabilities, in term of innovation and related to competences built up by Design Schools in the Milan area.

Actual geographical area of the policy:

- Milan province, Italy;
- Como province, Italy;
- Monza and Brianza province, Italy.

Organisations and intermediaries actually engaged to implement the policy:

- CCIAA, MC and Province of Milan which have promoted the policy;
- The Chamber of Commerce of Monza e Brianza and Como;
- Six Design Schools located in Milan and Como;
- Triennale Design Museum of Milan.

Beneficiary firms and respondents

A4Adesign:

A4Adesign is based in Milan and since 2002, it has been involved in the creation and production of design objects and furniture in honeycomb cardboard.

The company designs and manufactures cardboard stage settings, installations for exhibitions and commercial areas and for refreshment and recreational areas for adults and children. All in recyclable and reusable cardboard.

Two architects, Nicoletta Savioni and Giovanni Rivolta, run the company from leading Italian and international studios, which still run their own business. Architecture strongly

influences the approach of these professional project managers, designers and communicators.

They discovered cardboard casually, and at first, the two architects revealed that it was a parallel activity to their main occupation as architects, becoming a full-time job after much vetting. Right from the start, creating urban designs with a strong aesthetic and social impact, A4A exploited the fun side of cardboard. They got into cardboard both with a vested interest and out of curiosity and working with this material has opened up exciting new opportunities and ideas, as well as enriching them professionally thereby allowing offering more to their clients by constantly dreaming up new and engaging projects.

Using cardboard in unconventional ways turned an idea into a concrete, strong, resistant, light and poetic project.

A4Adesign was founded to provide continuity and freedom for this project. Its positive and responsible approach aims at giving a formal and functional answer with each of its creations and to look at things from a different angle together with the people and the companies who decide to enter into its world.

Leone 1947:

In March 1947, after many years of experience in the leather industry, Cav. Orlando Leone founded LEONE 1947, a sporting goods company, based in Milan. The passion for boxing directed the founder towards the production of box-related articles and the company soon became the market leader.

Since then the brand has always risen on the ring throughout Italy and the world, bringing its manufacturing expertise to the service of new emerging disciplines: Kick Boxing, Thai Boxing, MMA and Savate.

In recent years LEONE 1947 has landed overseas, spreading its business into new markets, consolidating its position as the leading Italian brand in the field of combat sports, thanks to the prestigious international sponsorship of champions like Giorgio and Armen Petrosyan, Gago Drago, Artur Kyshenko, Alessio Sakara, Chingiz Allazov, Yuri Bessmertny and many more.

Merlimarmi:

The company is a small company that operates in the province of Voghera, is present in the marble sector for many years and this is its core business. The company views the problems of the sector and thanks to the thrust of its manager and owner Paolo Merli has tried to innovate and continues to pursue advanced projects related to the field of marble.

Momodesign:

In 1981, in the wake of the international success of MOMO, a world leader in luxury accessories for cars, Momodesign was founded as a style centre specialized in research and development of car design.

Since the early years, alternating Momodesign research activities in the automotive industry to the development of ideas and projects in the field of life-style accessories, creating a line of products that helped create the image of the brand. The shareholders who inherited is the image that Momo has created the world, an image of an Italian brand closely tied to racing, especially F1 and Ferrari, with products that are distinguished for cutting-edge design and the strong sports and technology. Just the DNA technology has contributed to the creation, in the early 80s, a line of accessories for men realized with highly innovative materials: carbon fibre, titanium and magnesium have been used for the first watches and sunglasses.

At the end of the 90s, followed the sale of the brand to an American company. Marco Cattaneo, Managing Director of the company from the beginning, decides to break away from the group and to detect the brand Momodesign undertaking, with the support of his children Paul and Eleanor. The new challenge was conducted to transform Momodesign into an international brand with a strong identity and a philosophy (http://www.momodesign.com/).

Sonnomedica:

The medical centre Sonnomedica was born in 2006 on the initiative of some specialists in the field of sleep medicine. Sonnomedica is the first private medical centre multi-disciplinary national devoted exclusively to the study of sleep and its mission is to provide a 360° high level for all the people who have problems related to sleep. Sonnomedica is present with differentiated services in all Italian regions and offers to children and adults

the assistance of a team of doctors and technicians able to provide each person a personalized care pathway. Their mission is making products that improve a third of our life.

Tucano Urbano:

Tucano Urbano is specialized in clothing and accessories for motorcycles founded in Milan in 1999, the company will appeal to lovers of movement in the city, regardless of the seasons and weather conditions. There are no limits for those who travel every day on two wheels.

Before devoting himself to clothing and accessories for motorcyclists, Tucano was producing computer bags. In 1999 there was a turning point for the company from this time forward Tucano will continue to manufacture backpacks and Pc bags, while the world of two wheels become independent with the addition of the "Urbano" adjective.

Four partners own Tucano Urbano: Francesco Colombo, Claudia Bertolotti, Nicholas Lurani, and John Monti. Only a small part of the production is realized in Italy, outsourcers in Far East do the rest of it. They have an organizational model almost perfect. As Francesco Colombo said: *"We started as a family and a group of friends, we have grown a lot and with great satisfaction"*.

In April 2012 Consilium SGR, fund management companies, acquired by the founders of Tucano Urbano Ltd. a majority stake. It is a planned capital increase ahead of an ambitious development plan for an expansion of production and distribution in the most important European markets.

Beneficiaries Firms	**A4Adesign**	**LEONE 1947**	**Merli Marmi**	**MomoDesign**	**Sonnomedica**	**Tucano Urbano**
Founded	2002	1947	N/A	1981	2006	1999
Industry	Furniture design	Boxing apparel	Marble design products	Accessories and clothing	Sleep Medicine furniture	Bike clothing and accessories

Turnover 2010	290 k€	3,955 mln €	370 k€	1,43 mln €	180 k€	15,8 mln €
Turnover 2011	300 k€	4,35 mln €	390 k€	1,627 mln €	200 k€	13,6 mln €
Turnover 2012	300 k€	5 mln €	470 k€	1,585 mln €	217 k€	11,4 mln €
Employees (2012)	6	14	5	12	6	30
Markets presence	Europe	Worldwide	Italy	Europe	Italy	Europe

Table 10 Italian background information of the beneficiary firms

3.2.2 Description of the Policy makers and intermediaries

Policy Makers could be defined as: 'The subjects that are in charge for a government to set and direct the course of action decided for addressing a specific governmental issue' (Webster's New World College Dictionary, 2010).

Another definition comes from OECD that instead defined policy intermediaries as follow: 'The implicit meaning of the word intermediary is that it is located between or among two or more parties, and although they help in the transmission/dissemination process, intermediaries do not initiate decisions to disseminate the content, products or services that transverse their networks or servers' (OECD, 2010).

Going in depth with the target policy, 'Un designer per le imprese' in its third edition (2012) involved different actors: the Milan Chamber of Commerce (CCIAA), Province of Milan, the Como Chamber of Commerce, the Monza e Brianza Chamber of Commerce, Material ConneXion Italy (MC), six Design Schools located in Milan and Como, and firms operating in the same areas.

The institutional promoter of the policy is CCIAA that operates as a player engaged in firms' competitiveness and competence enrichment. Other institutional actors sustained CCIAA in this initiative. In 2011, Province of Milan played a role as partner promoter and funder of the project; in 2012 two more chambers of commerce, the Como Chamber of

Commerce and the Monza e Brianza Chamber of Commerce, decided to support this policy and to expand the coverage involving new firms located in their areas.

Talking about intermediaries' players the main role in the implementation and coordination of the policy is MC. MC is the operative promoter of the project, it actually manages and organises the meetings between firms and young designers following and scheduling all the phases of the project. It designs and prepares policy structure, it goes and submits it to the institutional partners and particularly to the CCIAA, then with the CCIAA it takes the firms' application data, selects the firm and then manages the collaboration between young designers, Design Schools and enterprises. Finally, it organises the closing event of the policy that is the exhibition of the best projects.

When the project starts, MC funds initially the overall project and in a second moment, it receives the public contribution from CCIAA, Province of Milan, Como Chamber of Commerce and Monza e Brianza Chamber of Commerce. MC also provides its knowledge in term of access to the *materials library* as well and it has an international network that is a facilitator for the initiative and it success.

The six Design schools are: the Politecnico di Milano, the European Institute of Design (IED), Nuova Accademia delle Belle Arti (NABA) and Domus Academy located in Milan area, Accademia di Belle Arti Aldo Galli and the Politecnico di Milano located in Como. These six institutes represent the excellence of the design knowledge and expertise in the area, they are fundamental actors because young designers that collaborate with firms are educated and trained in them. They own the knowledge of not only design but also regarding design applied to innovation. They represent the differential driver in term of applied design that can be vital in the enterprises' competitiveness in Milan, Como and Monza & Brianza areas.

These Design School do not provide funds but knowledge and trained human resources for firms that participate to the policy. The aim of the collaboration is to develop a network and relationship between teaching institution and firms in order to maintain the differential advantage that Milan owns in term of design knowledge. The six institutions contribute to the "design system" in the creation, spreading and evolution of design and innovation knowledge in the area, which is necessary for the firms' competitiveness.

Chambers of Commerce:

CCIAA, Como Chamber of Commerce and Monza e Brianza Chamber of Commerce are public institutions that support and promote services of interest to the firms and enterprises located in the Milan, Como and Monza e Brianza areas. More specifically, they promote activities that focus on encouraging entrepreneurial training and tuition, facilitated credit for business, innovation and transfer of technologies, the protection and safeguard of the environment in relation to manufacturing activities, infrastructure development and the exploitation of the resources within the area. They focus on targeted activities that in general aim to boost the economic development of the area and the level of competitiveness of the local business system at a domestic and international level.

Province of Milan:

The Province of Milan is an administrative public and local institution; it rules and regulates many fields, from business, to local public services such as transport, health care and energy.

The institution entered into the policy as a public partner and a public promoter, funds the policy with an overall contribution of the 20% of the total project's budget. The province of Milan does not collaborate into the operative process of selection and organisation of the programme but it has provided a large database of the firms operating on the Milan area that was a useful tool in the promotion of the policy itself.

Material ConneXion (MC):

MC is a company and the largest centre of research and consultancy on materials and on innovative and sustainable production processes, with offices in New York, Bangkok, Beijing, Cologne, Daegu, Istanbul, Milan, Seoul, Skövde and Shanghai. Founded in 1997 in New York, with offices in Milan since 2002, the *materials library* is a physical storage of materials, consisting of over 7.000 materials, innovative and sustainable production processes from all over the world. MC promotes the creation of contacts between the producers of materials and potential users (companies, designers, architects, students, etc.) to support them in the search for material solutions for their projects.

Design Schools:

Politecnico di Milano, Politecnico di Milano located in Como, IED, NABA, Domus Academy and Accademia delle Belle Arti Aldo Galli are six of the most famous Design School in the national landscape. They represent the Italian excellence in design education, and they are the centre of knowledge and they maintain a particular expertise in the formation as well as a competitive advantage in the global market.

These six universities are both public and private ones, administered in different ways and with different profiles of universities, fees but all of them represent excellence in a different approach to design and design innovation as well.

Triennale Design Museum of Milan:

Triennale Design Museum of Milan was born out of town, in Monza to be precise, and since 1933, it has been serving the city as a fundamental hinge between production, research and display. Its present role, particularly in recent years, has become increasingly focused on the fundamental function of linking up the establishment and the exhibition activities in the region, at the same time developing a specific relationship with the world of research, the designers and the manufacturing industry. From this endless stream, which is positively teaming with connections, emerges the Triennale's function. Over 500,000 visitors a year, the majority of who are young, demonstrate just how aware our area is of design issues. A hotbed of creativity all set to contribute to the development of knowledge and the country system. This is the Triennale's vocation, to provide a concrete opportunity for the crossover of territories, people and ideas.

3.2.3 Description of the Policy process

'Un designer per le imprese' is structured as a public competitive bidding trough which firms are selected. In this chapter we want to explain how the policy works and what are the phases in which each firms has involved. Relating to the role of MC within the projects, we reported a claim on the delivery of competences from Design Schools to firms: *"It is controlled by MC and enabled by us with a structured process, from the presentation of the project brief to the selection of the winning concept. We have seen how*

the knowledge exchange is not one-sided but mutual between firms and students" [Federica Pastonesi – Material ConneXion].

Starting with the planning of the competitive bidding done by MC and CCIAA in January and February, after this phase, around March, CCIAA publishes the competitive bidding: this represents the starting moment for the firms application. The application submission lasts one month, usually during April. Below we describe the phases that connote the entire policy:

1) **Selection phase**: March-April;
2) **Briefing phase:** May;
3) **Concept development phase:** June-July;
4) **Prototype development phase:** August-October;
5) **Exhibition and Book phase:** November-January.

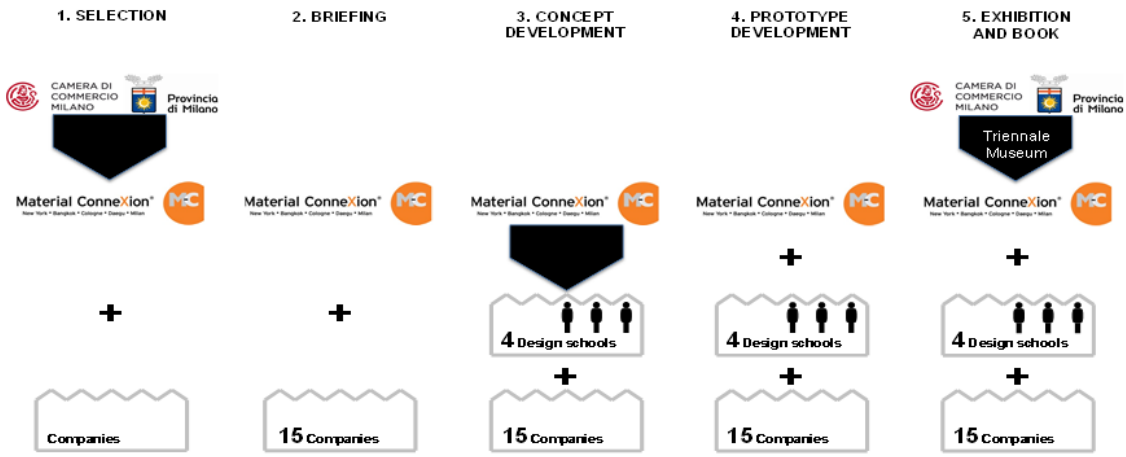

Figure 9 Framework of 'Un designer per le imprese'

The **first phase** named **selection** is the planning and organisation of the competitive bidding. During this period MC prepares and organises the overall project, designing its structure, defining the objectives, the support that will be provided to enterprises and the ways Design Schools will collaborate with firms. This phase is fundamental in order to structure an efficient and effective policy. After the preparation of the bidding, MC submits it to the CCIAA that reviews the project and decides if it can be funded or not. The policy is usually selected by CCIAA as a main project regarding innovation design and

support to SME's. After the selection, both MC and CCIAA start to promote the DIPI through databases and companies register; they open the competitive bidding and begin to receive firms' applications data.

MC and CCIAA gather all information that is necessary for the selection of enterprises: firms' economics, structural data and project briefs. In the 2012 edition, the total amount of firms selected were 25 divided as follows: 15 firms in the Milan area, 5 firms in the Como area and 5 firms in the Monza e Brianza area.

All of the firms were selected depending on defined parameters:

Related to the company	**Rating**
Entrepreneurship	0-3
Risk appetite, propensity to renewal and experimentation	0-5
Capacity for technological and production innovation	0-10
Sensitivity to design and product innovation	0-10

Table 11 Selection criteria of the Italian Policy related to the company

Related to the project	**Rating**
Quality and technical feasibility of the project	0-12
Maximum score achievable (total rating)	40
Minimum score for admission	20

Table 12 Selection criteria of the Italian Policy related to the project

The selected firms in the previous editions of the policy cannot apply for the new one.

The selection phase is a critical one because it compromise the real effectiveness of the project and the achievement of the results. This is what Roberto Calugi confirmed in the following statement: *"We select those enterprises that want to innovate; we start from the demand for innovation and design not from the supply of design competencies to the firms. We strongly believe that a real path of innovation is possible only if there is a strong*

commitment in it that is why we want a strong design demand in order to provide a policy" [Roberto Calugi - CCIAA].

The **second phase** named **briefing** starts when the firms are selected as target for the initiative. It consists in the selection of young students or designers that will collaborate with enterprises and in the explanation of the project briefs prepared by firms in a general meeting with the six Design Schools.
Depending on the project brief as well, after the selection time we can identify the description of the firms' brief to young designers and the six Design Schools. Each enterprise in collaboration with MC meets each of the Design Schools and describes the project brief. Each university in that phase assign the brief to a team of young selected designers that will develop the concept with the support of a university tutor.
Students working on the projects are followed by a tutor and in the meanwhile are supported by MC (one tutor for every fifteen students).

The next or **third phase** named **concept development** consists in the concept development where each team of the six Design Schools work and develop a product concept around the brief given by enterprises. The brief consists in an innovation idea regarding a product or a segment that is interesting for firms selected and a series of parameters or constraints that limit the concept (e.g. price, production technologies, production costs, etc.). In this phase, the main objective of the programme emerges. The collaboration between firms and young designers team represents in this terms the support given by the policy, it involves the design knowledge that trough designers goes into enterprises and can be retained and absorbed increasing firms' design capabilities. The policy was structured exactly on these aspects as came out from the CCIAA interview: *"The most important aspect of the project is the enterprise-driven point of view; we build the policy around the firm and not for Design Schools"* [Roberto Calugi - CCIAA]. The continuous collaboration and comparison between students and firms permit to design interesting and innovative concepts.
The support received by firms is a non-financial one, as it is underlined in the interviews we made to prepare this report: *"The beneficiaries do not receive any direct monetary financing. The support they receive is the possibility to develop projects with prestigious*

Design Schools without increasing staff costs within the company" [Emilio Genovesi - Material ConneXtion].

The fourth phase of the policy named **prototype development** is the prototyping phase. Every firm after the concept development phase selects the best project among those prepared by the young designers that worked on it. The concept selected is the one the firms thinks could be a profitable product and prototyped. The enterprise decides autonomously the winning project and produces a prototype of it at its own expenses: *"The subsequent development of prototypes and products designed through the policy is instead entirely financed by the company"* [Emilio Genovesi - Material ConneXtion]. MC and CCIAA do not interfere in this decision.

After the prototype development phase, there is the closing step of the policy that is the **fifth phase** named **Exhibition and Book**. It concerns the exhibition of all the projects in the Triennale Design Museum. The exhibition is a moment of group validation, a moment where designers and firms can create a sort of innovation network. MC organises the exhibition of all the concepts in a prestigious space in the Triennale Design Museum and prints a book that contains all the projects developed during the policy. The closing step is more a promotional event than a real step of the support policy, but is important as well because it permits to little enterprises to be known and create a network between designers and innovative SME's. In this final initiative the four prototypes winners of the special prizes, the 15 prototypes developed by companies and the drawings of all the projects submitted by students will be exposed.

Design Policy data

The first edition of the policy has not had among the target companies the expected results, in fact there was not a real selection, but almost all of the companies that participated in the announcement were selected. The second edition saw the interest in politics expressed by the Province of Milan, which resulted crucial for two reasons: it was possible to increase the number of companies reached via e-mail newsletter sent by CCIAA, which promoted the initiative, and business has been classified by sectors. In fact, thanks to the database

made available by the Province, the Chamber of Commerce was able to reach a greater number of enterprises, and above all to have information on the different areas in which each company operates. This has allowed selecting companies that respected and reflected the best pre-requisites for participation in the competition, from the point of view of the business sector. Another element was added by the schools of Monza and Brianza and Lake Como, and their participation marked a territorial expansion of the policy. The importance of this expansion of the borders and the involvement of Monza and Brianza was essential in view of the high concentration of manufacturing SMEs located in the area.
Size of budget allocated to implement the policy (in EUR): 475.000€ divided as shown in the table below:

Edition	Total budget	Breakdown
2010	200.000 €	50% is funded by the CCIAA as a contribution refund on a statement of expenditure, provided by MC at the end of the initiative, and the remaining 50% funded by MC
2011	120.000 €	50% is funded by the CCIAA, 25% by Province of Milan and the remaining 25% by MC
2012	155.000 €	40% is funded by the CCIAA, 20% by Province of Milan, 13% by the Monza e Brianza Chamber of Commerce, 10% by the Como Chamber of Commerce and the remaining 17% by MC

Table 13 Budget of the Italian Policy

The promoter of the policy informed us that it is still a project with big opportunity to growth especially in term of budget and firms' participation: *"We are thinking about increasing the budget for the 2013 edition in collaboration with the Municipality of Milan, bringing it to a total funding of 700.000€"* [Roberto Calugi - CCIAA].

Number and type of beneficiaries, results obtained by the policy:

Edition	N. of involved firms	N. of projects	N. of prototypes	N. of products launched on the market
2010	15 (all 15 in the Milan area)	60	15	6
2011	15 (all 15 in the Milan area)	60	15	5
2012	25 (15 in the Milan area and the other 10 in the Como and Monza e Brianza area)	90	26	4

Table 14 Outcome of the Italian Policy

The side aspects

Finally is relevant for us highlighting how, in addition to the intended objectives and characteristics, the policy presented some side or soft aspects and resources that were central in the perception of beneficiaries firms.

As we have already explained, the support received during the participation was the same for all the enterprises involved into the DIPI, and it was provided in terms of knowledge and expertise. A key point that differentiates the policy was the collaboration with the Design Schools, which permitted to work with skilled young people with an academic background that was outside of firms' competences. The knowledge and the external point of view they brought in was significantly important during the project. We received feedbacks from the great majority of the beneficiaries' firms that could confirm these aspects: *"In the beginning we were suspicious: what these young students want from us, why they think they can design something better than us that work on it every day? But the more the project was rolling, the more we got committed in it, and we started to see the potential of the collaboration with external people and young, active, formed designers"* [Veronica Masiero - Leone1947].

Consequently what emerges from our evaluation is that the effectiveness of the policy is strictly linked to the indirect support received by the firms in terms of Design School and intermediaries. Majority of the companies said they were going to increase their use of designers in the future compared to the amount they used before participating in the DIPI. What we could affirm about all the companies involved was the useful aspect seen about the collaboration between firms and designers student: *"This experience has helped us to have new ideas, ideas of students who did not know the material and its processing, and therefore we have received a completely different way of seeing it and work with it".* The young designers gave an interesting point of view about the material; many enterprises did not have collaboration with universities and students in the past, so that kind of inexpensive cooperation resulted in a big plus on "innovativeness" for the policy as stated by Tambascia: *"Within the company was born the desire to develop relationships with universities. We have seen the importance of opening up to this kind of collaboration"* [Mirko Tambascia - TucanoUrbano].

After the presentation of the Italian target policy that was the starting point of our research, it is time to introduce and describe the other European case studies on which we based our investigation.

3.3 Design Policy in the Swedish context

Sweden public investments in design are particularly high especially compared to the overall size of the economy. There is a clear ambition of the government for the development of design, focusing on both the competitiveness and benefit to society. There are many companies in the field of design services; however, the low number of design graduates indicates the possible long-term difficulties. In the illustration below we provide a general dimension of the Swedish design sector.

		2000	2001	2002	2003	2004	2005	2006	2007	Most recent
Public investment in design	Total investment (Euro M)					4.23	4.23	4.23		
	Total investment US $ M 2007 prices					5.63	5.43	5.59		5.59
	as a percentage of GDP (x 10 $^{-3}$)					0.01823	0.01778	0.01679		0.01679
Design graduates	Total number						540			540
	per million population						60			60
WIPO design registrations	Total number	1,609	1,893	1,635						1,635
	per million population	181	213	183						183
WIPO trademark registrations	Total number		13,417	12,654	9,877	8,948	11,442	11,753		11,753
	per million population		1,508	1,418	1,103	995	1,267	1,295		1,295
Number of design firms	Total number	5,150	7,750	8,459						8,459
	per million population	580	871	948						948
Turnover of the design services sector	Total turnover (Euro Bn)				0.84					
	Total turnover US $ Bn 2007 prices				1.12					1.12
	as a percentage of GDP (x10 $^{-3}$)				3.52					3.52
Employment in the design services sector	Total number	4,950	4,600	4,238						4,238
	per million population	558	517	475						475

Table 15 Swedish design context data (source: Dr James Moultrie and Finbarr Livesey, 2009)

The national approach to design is that it can help to serve the dual goals of innovation and improvement in the quality of life (Ministry of Industry Employment and Communications, 2004).

Sweden as a part of EU has agreed on the importance of both design and innovation for future competitiveness. It is regarded as a highly creative and innovative nation and stands out in rankings of innovation climate and competitiveness. Sweden innovation performance is one of the best in the world, ranked no. four (of 144 nations) on the Global Competiveness Report 2012-2013 and no. five on the pillar of innovation (World Design Survey, 2011).

Design can contribute to an increase in the level of quality for the company in terms of functional, technical, ecological, aesthetic and social. From the industrial point of view, the government recognizes that the effective use of design in business is able to enhance the competitiveness and contribute to economic growth and development. This Swedish approach wants to show that design cannot only stimulate the economy, but also provide improvements for society as a whole.

Specific design-related initiatives include ‘Design for All’, which aims to make all public spaces accessible by 2010, the creation of a European Institute for Innovative Caring

Design to support research and education, and a Swedish Centre for European Design Research (Kolmodin, A. and A. Pelli 2005).

Based on the OECD studies, Swedish government has in 2012 created 'A National Innovation Strategy' (source:http://www.regeringen.se/sb/d/14440). The links to design and design innovation is not explicit stated in the strategy, but implicit in words and objectives as design as an important driver for user-friendly innovation in products, services and processes. For the design field no similar national strategy or policy has been implemented, like in Finland and Denmark.

In 2009 the Swedish Government decided a national action plan for cultural and creative fields (source:http://www.regeringen.se/sb/d/11347/a/131748). The Swedish Government has in their action plan given to the Swedish Agency for Economic and Regional Growth (Tillväxtverket), Swedish Governmental Agency for Innovation Systems (VINNOVA), Svensk Form and Swedish Industrial Design Foundation (SVID) the assignment to promote and develop design as a tool for need-based innovation, network, research and education.

VINNOVA had the responsibility to invite private and public organizations to create programs and projects for strategic research and innovation agendas in 2012. Design for competitiveness is one of these on-going projects driven by SVID. The Program of Innovation & Design in 2012 has the purpose to stimulate design and the development of design as a method and tool between design firms and companies without design competences.

3.3.1 The Policy: 'Design som Utvecklingskraft'

'Design som Utvecklingskraft' (roughly; Design as a Development Force) is rather a program than a real policy, it might up be the largest Swedish design innovation initiative and here somewhat carelessly we referred to with the word 'policy'. As the evaluation report showed, this programme include nine design policy of which the 'Design för export av medicinsk teknik' was chosen as target for the analysis.

In 2002 the Swedish Government commissioned SVID (the Swedish Industrial Design Foundation) and the association Svensk Form to develop a proposal for a national program for 'Design som Utvecklingskraft'. As a result of this proposal the Swedish Government

granted SVID with 6.7 mln € to run the program during 2003-2005. 1 mln € of the granted 6.7 mln € was devoted to the Design Year 2005, run by the association Svensk Form. Remaining 5.7 mln € (1.9 mln €/year) was used to finance 9 national and 25 local and regional programs targeting business and public sector, all provided by SVID.

Governments' decisions stressed that initiatives directed towards the industry should be prioritized in the use of the grant. The connection between *design and competitiveness* and *design and sustainable growth in SME's* was also to be prioritized. Further was the grant associated with a requirement of external co-financing corresponding to a minimum of 50% and that the program should be evaluated.

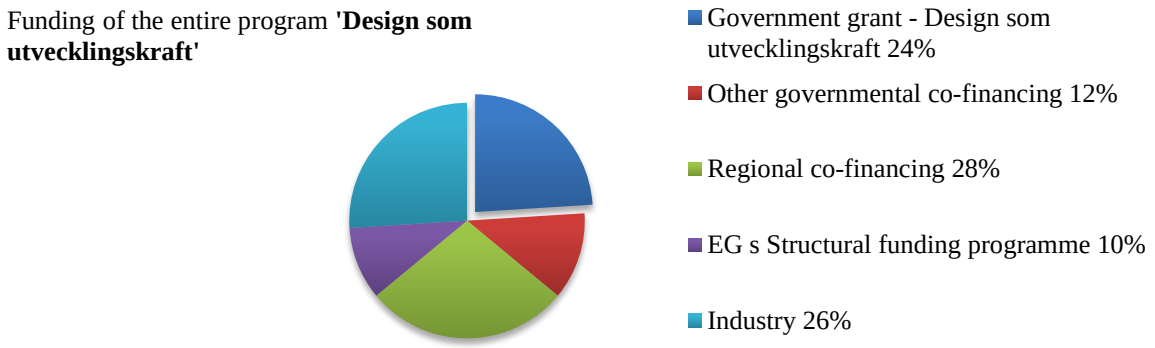

Figure 10 Budget structure of the Swedish programme 'Design som utvecklingskraft'

'Design för export av medicinsk teknik' (roughly; Design for export of medical technology) was directed towards successful companies in the industry of medical technology who had no or limited experience from working with design but were "ready to start". In effect the overall goal of the initiative was: "*(...) increase the number of "design-mature" companies in Sweden, e.g. companies that understand to and how to use design as a method to strengthen their development work"* [Robin Edman - CEO SVID].

Medical technology is a profitable and important Swedish export industry where companies often develop their products direct for the international market with a great development potential that designers could help to realize.

Christer Ericson the project leader had a long experience from the industry and put a lot of effort on getting the right companies on the project.

DIPI project “Design för medicinsk teknik” had a total budget of 825 K€ of which governmental funding constituted 35% and the industry covered the remaining 65%.

Funding of the policy **'Design för medicinsk export project'**

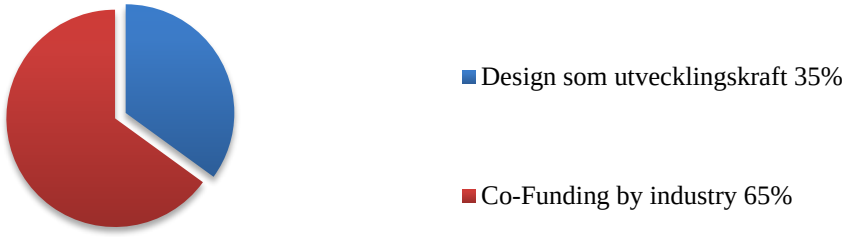

Figure 11 Budget structure of the Swedish policy 'Design för medicinsk export project'

Beneficiary firms and respondents

Arcoma:

Produces and develops X-ray stands. Arcoma has positioned themselves as a company that works with focus on ergonomics, technology and flexibility. The company had worked before the project only with design of technical components, the non-visual inside of the products. They did not take active part in designing the “visual outside” of the products that was done by their customers.

Camp Scandinavia:

Camp Scandinavia is a family-owned corporate group that develops, produces and sells products for orthopaedic rehabilitation in 50-60 countries. Aside the company’s own proprietary products it acts as a distributor for many major companies in orthotics and prosthetics. Are located in Sweden, Denmark, Finland, Belgium, China, Hong Kong, UK and USA.

Perimed:

Perimed provides instruments, software and expertise for precise and convenient measurement of vascular function and diseases. Developments, manufactures and markets state-of-the-art equipment for micro vascular diagnosis. With customers in more than 80 countries, Perimed also actively participates in a wide range of research projects together

with leading universities to deepen our understanding of diseases related to blood perfusion and micro vascular functions. Perimed has subsidiaries in the UK, United States, France, Italy, Germany, Mainland China and Hong Kong.

Permobil:

Permobil, who was the largest company in the project, is one of the world leading distributors of electric wheelchairs. At the time of the project, Permobil sold 8.600 wheelchairs in 20 countries; today the company sells 16.000 wheelchairs in about 30 countries.

Beneficiary Firm	**Arcoma**	**Camp Scandinavia**	**Perimed**	**Permobil**
Founded	1990	1952	1981	1967
Industry	Medical furniture	Orthopaedic rehabilitation	Micro vascular furniture	Electric wheelchairs
Turnover before the policy	13, 3 mln €	11 mln €	4,5 mln €	110 mln €
Turnover 2011	12,9 mln €	20 mln €	4,5 mln €	166 mln €
Employees before the policy	57	75	29	700[1]
Employees 2011	58	190	43	191[1]
Markets presence	Worldwide	Worldwide	Worldwide	Worldwide
[1] Firms shareholder structure has changed during the target period that is why these figures are not fully comparable.				

Table 16 Swedish background information of the beneficiaries firms

3.3.2 Description of the Policy Makers and intermediaries

The interview protocol for policy maker has been used for both the interviews, with policy maker and the policy provider. Policy maker and policy provider are in this case

represented by the same organization (SVID) but by different respondents who held different positions in the execution of the program.

SVID:

SVID, The Swedish Industrial Design Foundation, was founded in 1989 by the Royal Swedish Academy of Engineering Sciences (IVA), SIND (later known as the Swedish National Board for Industrial and Technical Development, or NUTEK, now Swedish Agency for Economic and Regional Growth), and the Swedish Society of Crafts and Design (Svensk Form). The board of SVID consists of representatives from the IVA, Swedish Agency for Economic and Regional Growth, Svensk Form and The Support Association for the Swedish Industrial Design Foundation.

At the time of its foundation, SVID's focus was on industrial design: hence the name. Today, SVID works along the lines of a much broader spectrum to demonstrate design as a force for development for the private and public sectors of the importance of design as a competitive tool and to encourage the integration of design methodology into their activities. Its target groups include industry and commerce, local government, designers, universities and colleges.

3.3.3 Description of the Policy process

This section starts with a description of the method used to select the programme and the beneficiaries firms, followed by a brief presentation and description of how data were collected.

Programme	Beneficiary firm	Additional for interviews
Preferably have a significant macro impact Be finished Be design oriented Have specific objectives Aimed to improve enterprise capabilities	No start-up companies Consider both services and manufacturing Include creative/design services Variety of dimensions, sectors etc.	Companies should still be in business Firm should be representative for DIPI participating companies Someone that was active part in the DIPI should be

	Random selection	available for interview

Table 17 Selection criteria of the Swedish Policy

All the initiatives of the program 'Design som Utvecklingskraft' were directly oriented towards design at varied degree, focusing on the development of the design capabilities in companies. Since our study focuses on how investment in design affect firms' capabilities, a first delimitation was done by excluding those initiatives for the development of design capabilities in the public sector or in the eco-system.

Professor Ulla Johansson did initial delimitations and selections based on the program evaluation report. The evaluation report showed that five out of the nine programs met the selection criteria. Nonetheless, project managers from only two of the programs were contacted:

1) The policy 'Design för export av medicinsk teknik';
2) The policy 'Förpackningsomvärdeskapare'.

Project managers were asked to help find representative beneficiaries and persons to contact, without just addressing the successful ones. Seven years have passed since the policy finished and it turned out that companies had been acquired, companies had new CEOs and employees had left for new jobs. Random selection of beneficiary firms was thereby not possible and finding and accessing beneficiary firms still in business with people available for interviews came to be the predominant selection criteria.

'Design för export av medicinsk teknik' was finally chosen for the case study based on the accessibility of beneficiaries.

Design Policy data

Size of budget allocated to implement the policies: 5.7M€

Number and type of beneficiaries that were intended to benefit from the policy and the outcome:

Beneficiaries	**Aim**	**Outcome**

Companies	350 Companies will participate in the DIPIs during at least 2 months	490 Companies participated in the projects during at least 2 months
	50 companies will run specific development project supported by design methodology	201 Companies have conducted specific development projects supported by design methodology
	300 companies will develop design concepts	498 Companies have through the projects developed design concept's
Municipalities	40 municipalities or companies owned by municipalities participating in the DIPIs	60 municipalities or companies owned by municipalities participated in the DIPIs
Students	200 students get professional practice during at least 7 weeks	406 Students did get professional practice

Table 18 Outcome of the Swedish Policy

Main results from the external evaluation was:

i. The program was economically seen as highly successful from the perspective of the government and the companies but not as successful from the perspective of the participating designers.

ii. Companies estimates an increase in turnover between 55.5 M€ and 83.3 M€. Since design seldom is the only driver of the increase in turnover firms was asked to value how design have been a necessity or contributing driver of the result. When weighted, the estimated raise in turnover driven by the design support was valued and they calculated to be between 9.7 and 13 M€.

iii. Only about 10% of all projects had generated, at the time of the evaluation, increases in turnover and recruitments. But Ulla writes in her evaluation report that two things are important to point out:

- These 10% very successful projects are so successful that they economically motivate the entire program
- Beyond the effects in turnover and recruitments large amounts of other, less measurable, effects have been achieved e.g. over 100 (of 162 answers) representatives for participating companies and organizations say they have

changed their attitude towards design and its ability to contribute to innovation and development.

3.4. Design Policies in the UK context

The UK has gained a reputation over the years as historical excellence in all types of design. Employment in design is competitive at international level, although there has been a steady decline over the past decade. Similarly, the design education is a national force base, but is threatened by the diminishing UK market for design graduate employment.
The total number of design graduates has steadily increased over the past ten years, from about 11.500 in 2000 (around 197 per million population) to 13.200 in 2007 (218 per million population).

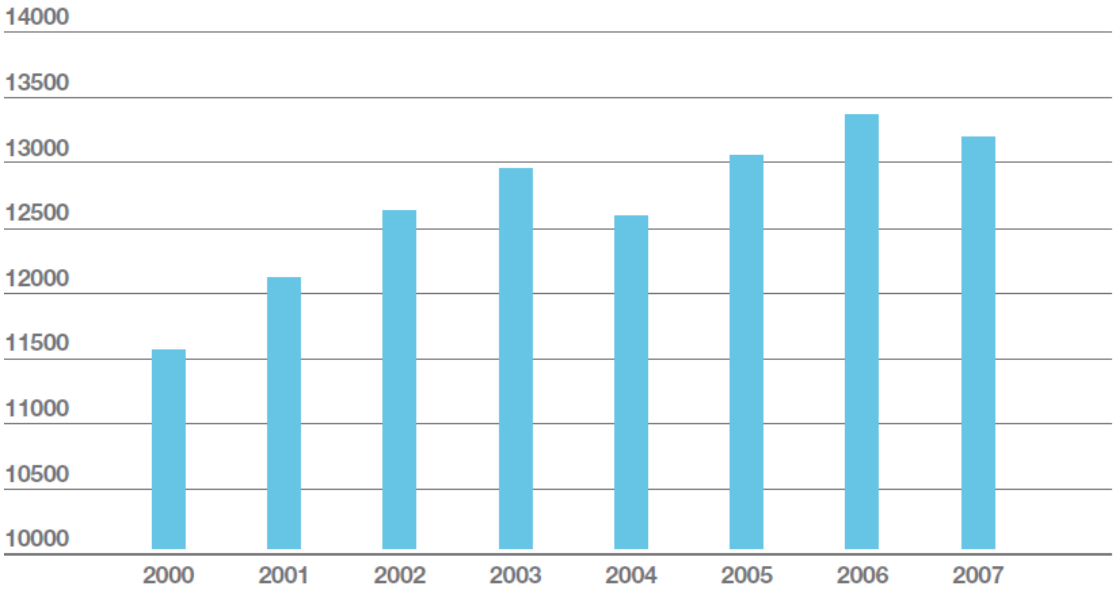

Figure 12 Trend of the total number of Design graduates in UK (source: Dr James Moultrie and Finbarr Livesey, 2009)

In the table below we provide a dimension of the UK design sector:

		2000	2001	2002	2003	2004	2005	2006	2007	Most recent
Public investment in design	Total investment (UK £ M)					7.25	7.83	8.50	6.00	6.000
	Total investment US $ M 2007 prices					14.51	14.90	16.36	11.89	11.89
	as a percentage of GDP (x 10 $^{-3}$)					0.00612	0.00635	0.00653		0.00653
Design graduates	Total number	11,605	12,159	12,684	13,005	12,645	13,110	13,420	13,270	13,270
	per million population	197	206	214	218	211	218	222	218	218
WIPO design registrations	Total number	9,768	7,828	9,192						9,192
	per million population	166	132	155						155
WIPO trademark registrations	Total number		34,534	30,595	28,351	28,755	29,821	32,044		32,044
	per million population		584	516	476	481	495	529		529
Number of design firms	Total number						12,450			12,450
	per million population						207			207
Turnover of the design services sector	Total turnover (UK £ Bn)	6.50	6.70	5.90	5.30	3.90	4.59	4.31	3.98	
	Total turnover US $ Bn 2007 prices	11.53	11.10	9.89	9.87	7.80	8.72	8.29		8.29
	as a percentage of GDP (x10 $^{-3}$)	6.84	6.74	5.65	4.74	3.29	3.72	3.31		3.31
Employment in the design services sector	Total number	76,000	82,000	67,000	68,000	70,000	70,759	64,847	61,680	61,680
	per million population	1,291	1,387	1,129	1,142	1,170	1,175	1,071	1,014	1,014

Table 19 UK design context data (source: Dr James Moultrie and Finbarr Livesey, 2009)

The leading organization that promotes and sponsors the English national policies on design is the Design Council. The UK Design Council aim to promote the importance of Industrial Design to industry and support firms in the use of professional design skills. The public investment in 2007 carried out by UK Design Council was around £6 million.

UK design policy has traditionally been developed in line with governmental industrial policy and industry's demands, in collaboration with other design-related organisations including government departments. Design policy is intended to help UK industry improve the economy and society, and increase the global competitiveness of the UK through design (Choi 2009).

	Industrial characteristics	**Design Policy**
1940s	Nationalisation	Initialisation of design policy
1950s	Major merger movement	Increasing promotion in design
1960s	De-industrialisation	Enhancing design awareness
1970s	Absolute industrial decline	Introducing design education programmes
1980s	Privatisation & de-regulation	Raising design awareness, improving design education and training

1990s	Continuous de-industrialisation	Improving design education, offering support to the public sector
2000s	Competitive threats and opportunities	Supporting the UK economically and socially

Table 20 UK Design Policy evolution in the last 70 years (Source: Adapted from Choi, 2009)

The last 20-30 years has seen a widening of support for UK businesses as a whole extending to the social and public sectors, including 'non-product' areas, for example, service design & design for well-being. Successive UK Government departments (BIS, DBERR, DIUS, and DTI) have set out broad-brush industrial, R&D and innovation policy, the interpretation and translation of which is often devolved to quasi-autonomous non-governmental organisations for implementation.
As we said above the Design Council is the main national organisation influencing and implementing design policy in the UK, developing campaigns and support programmes appropriate to various sectors.

3.4.1 The Policy: 'Designing Demand'

We make our research on **Designing Demand** programme, an initiative that promotes design policy in the UK**.** Here most of the English Regional Development Agencies were key co-founders and shapers of the programme and its implementation; the programme now operates at the national level and is managed in its entirety by the Design Council.

Designing Demand was introduced in 2005 and has evolved continually to its present day form. It is presently funded to 2015 as part of the Design Council's Design Leadership Programme. The programme sets out to improve the performance of UK businesses by helping them to use design as a key driver of growth and competitiveness. The programme's overarching objective is to embed effective processes for the management of design in SMEs and also specifically in technology start-ups.

The **Designing Demand** programme was created and launched by the Design Council in partnership with the RDAs following a recommendation from the Cox Review (2005)

which identified five main barriers that prevented SMEs from accessing the UK's creative sector, principally:

1. Lack of awareness and experience (of the UK's creative talents)
2. Lack of belief in the value of, or confidence in, the outcome
3. Not knowing where to turn for specialised help
4. Limited ambition or appetite for risk
5. Too many other pressures on business.

Design Council planned and organised a programme aimed at empowering performances for SMEs in the national landscape. Starting from those five main barriers and clear in mind that what was required was a national programme available to SMEs regardless of their location, the programme was developed. This needs all of the RDAs and the devolved administrations vigorously, have driven the programme (Cox Review of Creativity in Business, 2005).

The Design Council own research has consistently shown a link between the use of design and better business performance across key measures including turnover, profit and market share, while at the same time demonstrating that most businesses are failing to make best use of design (Design Council 2007).
This evidence helped to create a powerful case for the Cox Review recommendation to accelerate the rollout of the former Design for Business programme, which had been piloted by Advantage West Midlands (AWM), South West Regional Development Agency (SWRDA) and the London Development Agency, and make it available to SME's nationwide (Godber 2008).

Designing Demand builds design capabilities in UK small and medium sized enterprises (SMEs) by helping them to understand how they can use design strategically and effectively within their business and embed design tools, techniques and management within business to build skills and capability. A learning by doing approach is adopted where professional coaches (Design Associates) work directly with businesses to identify where design can best meet their goals and then supports them in implementing tangible projects. Businesses are taken through a programme that includes workshops, coaching and

peer-to-peer support. CEOs and management teams work explore, define and implement design opportunities that will deliver business growth.

The Design Council recruits, retains and develops a national network of Design Associates, who are invariably successful independent design professionals with expertise across all design disciplines. They are engaged by the Design Council to work on individual projects and who offer independent advice while adhering to a strict ethical code of practice.
Design Associates have worked across a range of sectors and with organisations of all sizes and stages of growth. Examples given by the Design Council include Virgin, Orange, Philips Design, Tesco, The NHS, Dyson and Black & Decker. They are recruited them not only because of their design expertise but also because they have business acumen, practical know-how and 'a genuine passion to support growth through innovation and design' (Eden 2012). The Design Council currently retains over 50 Design Associates.

Due to the evolution of the **Designing Demand** programme and its various methods of implementation and delivery over time, a historical budget figure for the entirety of the programme since 2005 is hard to obtain. For the current spending review period (2012-15), £1.3m per annum (€1.52m) has been allocated to Designing Demand.
Taking part in the programme costs between £2k and £15k depending on your needs and the size of your organisation. This funds a package of bespoke design support and coaching to help you identify opportunities to reap the rewards of design. You will be working with some of the most experienced designers in the UK who will also help you to procure talented teams to implement your design projects.
The Design Leadership programme is supported by the Department for Business, Innovation and Skills; each year a number of places on the programme are subsidised by 50%.

Beneficiary firms and respondents

Engineering Company (Sme): *(Specifically requested anonymity)*
The company was selected as a case beneficiary for Designing Demand because besides fulfilling all the selection criteria, it is an exemplar of using design to enhance its business

capability. The company has been designing and manufacturing industrial filters for over a quarter of a century. The company was founded in the NW of England in the mid-1980s by two brothers, trading as a partnership. The company's initial focus was retailing mesh and finding practical uses for it, but now specializes in bespoke filter design & manufacture and can provide customers with filter manufacturing solutions in any shape or design in expanded metal, perforated plate or wire mesh.

The company employs 20 people and turnover for 2011 was €1.69m, an increase from €1.33m in 2010 (although profits remained the same). Unusually, for a company of its size and sector, the business' legal status is that of a 3-way partnership, rather than limited company.

Naylor Industries:

Naylor Industries was founded in 1890 to manufacture clay pipes. It now has three divisions; Naylor Drainage, focused on clay and plastic drainage pipes; Naylor Concrete Products, which services the construction and civil engineering sectors; and Naylor Gardenware, which manufactures two ranges of clay products. Naylor has factories in Yorkshire, Fife and the West Midlands, and a turnover of £250m.

Challs International:

Chas International began making cleaning products in the early 1990s and owned several brands, the most successful of which was Buster. Based in Suffolk, it employed around 20 people and had a turnover of around £1m when joined the Immerse service.

Owlstone:

Owlstone launched in 2004 to develop nanotechnology capable of detecting airborne chemicals in extremely small concentrations. It focused initially on military security.

Using leading-edge micro and nano fabrication techniques, Owlstone has created a complete chemical detection system that is one hundred times smaller and one thousand times cheaper than existing technologies. Owlstone works with market leaders within these applications to integrate its detector into next generation chemical sensing products and solutions. Owlstone's technology offers a unique combination of benefits,

including: small size, low manufacturing costs, minimal power consumption, reduced false-positives, and a customizable platform.

Beneficiary Firm	Engineering Company	Naylor Industries	Challs International	Owlstone
Founded	1985	1890	1990	2004
Industry	Design and manufactures	Manufacturer of building & construction products	Cleaning products	Nanotechnology
Turnover before the policy	1,33 mln €	250 mln €	N/A	N/A
Turnover 2011	1,69 mln €	250 mln €	1 mln €	N/A
Employees before the policy	N/A	N/A	N/A	N/A
Employees 2011	20	N/A	20	N/A
Markets presence	N/A	UK	Worldwide	Worldwide

Table 21 UK background information of the beneficiaries firms

3.4.2 Description of the Policy Makers and intermediaries

Department for Business, Innovation & Skills (BIS):

BIS is the department within UK Government responsible for economic growth. The department invests in skills and education to promote trade, boost innovation and help people to start and grow a business. The department covers almost every aspect of the economy, from higher education and skills to business and trade, from consumer issues to regulation.

Design Council:

The Design Council is the national strategic body for design in the UK. It aims to inspire and enable the best use of design by the UK, in a world context, to improve prosperity and

well-being. It helps people and organisations in business, education, public services and government understand design and use it effectively as part of their strategy.
The Design Council also increases awareness of design through events, publications, case studies highlighting examples of design and innovation in action and online knowledge helping people find out about design and make more informed design decisions. The Council developed and managed Designing Demand, a national business development mentoring service for SMEs.
The remit of the Design Council extends beyond business to: '(…) use design to transform communities, business and the environment for the better. As an enterprising charity, our work places design at the heart of creating value by stimulating innovation in business and public services, improving our built environment and tackling complex social issues. We inspire new design thinking, encourage public debate and inform government policy to improve everyday life and help meet tomorrow's challenges today' (Eden 2012).

Although the Council is the best-known body supporting design in the UK, there are several other important agencies. Design Wales and the Lighthouse in Scotland are important regional bodies supporting design. In addition, other private and public bodies also play important roles in championing design (e.g. British Design Innovation, Design Business Association, the Crafts Council, and the Design Museum).

3.4.3 Description of the Policy process

The Design Associates provide guidance and direction to develop a brief, procure appropriate resources (usually design agencies) and ensure that projects get delivered.
The programme experience is intended to be "high quality and pragmatic" and this requires the involvement of important stakeholders, both internal and external to the business.

Three phases of development can be identified in the development of the programme:

1. Phase 1: Originally there was a pilot called Design Works. From 2006 to 2007, the pilot programme was delivered in Yorkshire, the South West and the West Midlands funded by the respective Regional Development Agencies (RDAs), and managed centrally by the Design Council;

2. Phase 2: Designing Demand launched by the Design Council in 2006 and gradually rolled out between 2007 and 2010 in seven of the 9 English regions. The RDAs funded the programme delivery through contracted Delivery Partners;
3. Phase 3: Following the abolition of the RDAs in 2010 by the Coalition Government the Designing Demand programme was subsequently restructured and is now delivered directly by the Design Council funded by the Department of Business Innovation and Skills (BIS) and match-funding from participating businesses, who each contribute 50% of the cost. It was renamed the 'Design Leadership Programme'.

Designing Demand offered three levels of support, each of increasing intensity and impact, with different points of entry and exit. The three levels of Designing Demand services were:

Level 1

- **Programme Introductions:** workshops for business advisors and designers to introduce them to the Designing Demand programme, including information on how to engage client SMEs with design. This is a 'one to many' service.
- **Skills Assists:** introductory educational workshops for client SMEs and technology venture start-ups using specially developed Design Council tools to identify design opportunities linked to an organisation's strategic goals. This is a 'one to many' service.

Level 2

- **Business Support Services:** diagnostics and tailored consultancy supporting key design areas including new product or brand development, with expert one-to-one mentoring support provided by a Design Associate drawn from the Design Council approved roster. There are two business support services at this level, Generate and Innovate.
- **Generate gets a design project going for small and medium-sized businesses with growth potential,** and focuses on a specific design project over a six to 12 month period. Generate is an opportunity to make design a long-term part of the business by developing new skills among staff, ranging from choosing and briefing designers to managing the design process. Generate normally consists of up to five

days of specialist consultancy, provided by a Design Council-approved Design Associate.

- **Innovate cuts time to market for new technology.** Innovate supports early stage technology ventures with the potential for rapid growth, helping them use design to strengthen their business proposition, attract funding, reduce risk and get to market faster. Technology ventures explore potential design opportunities through an intensive diagnostic process and then work on a range of projects for up to 12 months with strategic guidance from a Design Associate.

Level 3

- **The Immerse service helps companies to build bigger profits through design-led strategies.** Immerse is a service aimed at mature businesses who are hungry for growth, have an appetite for new ideas and are willing to invest in realising these ideas with the support of a Design Associate. Up to 15 days of mentoring are delivered over a 12 to 18 month period. The service also provides a cohort of 14 client SMEs the opportunity for peer-to-peer learning through a series of three specialist workshops on the subjects of brand, new product development and user experience.
- SME design projects implemented to date as a result of participation in Designing Demand's Generate and Immerse services have drawn on a wide range of design disciplines. These include strategy and process, branding, new product design, marketing and communications, packaging, web design, environment and service design.

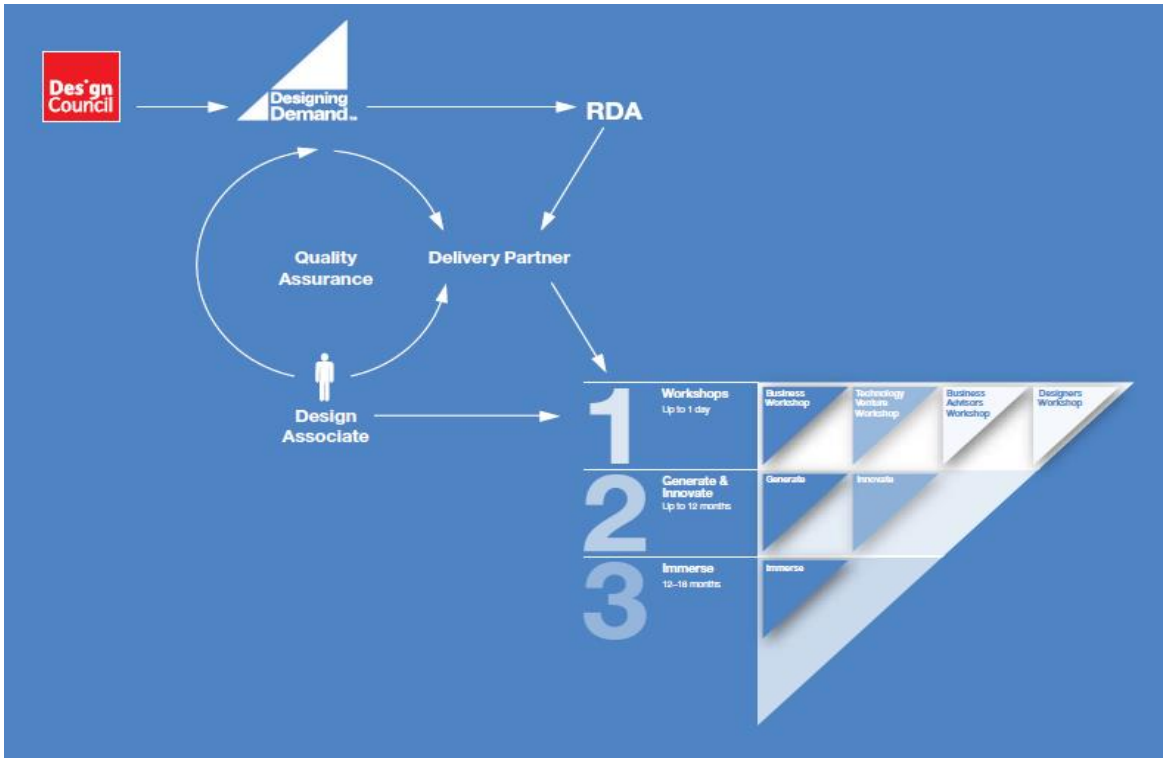

Figure 13 Design Demand programme delivery (Source Godber, 2008)

Design Policy data

Since 2007, the programme has supported over 2000 SMEs, intensively coaching over 700. The programme is part of the Government's national portfolio of support for SMEs with high-growth potential. The estimated national gross impacts are combined actual/ anticipated additional revenue of £140m, an overall increase in operating income of just under £28m.

Aim	Outcome
15 Jobs/Employment opportunities created 60 Jobs safeguarded	196 Jobs/Employment opportunities created 5 Jobs safeguarded
10 companies receiving business advice	10 companies receiving business advice
5 companies engaging in new collaborations with the knowledge base	3 companies working with universities
40 with at least 4 senior managers skills are assisted in each company	54 attendees to 3 NetWorkshops 15 attendees to an in-house

	brainstorming/NPD workshop

Table 22 Outcome of the UK Policy

3.5 Design Policies in the Polish context

In 2006, commissioned by the Ministry of Economy, a research was carried out on the application of design in Polish enterprises. Research results had a direct impact on including design in such documents as the National Development Strategy or National Cohesion Policy as an element fostering the Poland's development; design was also featured in the national reform program and in regional operational programs. Moreover, design was classified as the so-called "ordered field of study" by the Ministry of Science and Higher Education. All those events created a certain context for defining design as an element influencing Poland's economic growth.

3.5.1 The Policy: 'Design Your Profit'

Under the National Operational Programme Innovative Economy, the Polish Institute of Industrial Design realized '**Design Your Profit'**.

Design Your Profit is the abbreviated name of the key project 'Improvement of the competitiveness of enterprises through the application of design (process and product innovation)', conducted by the Institute of Industrial Design from September 2008 to December 2011.

The project "Design Your Profit" (in short: DYP) was co-financed from public funds within the framework of Operational Program, Innovative Economy and Priority Axis, supporting institutions within the business environment, providing pro-innovation services and their networks of over-regional importance. The contract was signed with the Ministry of Economy.

One of major objectives of the project was to create a network of partnership collaboration encompassing various Polish business-related institutions and organizations and to educate them in the field of supporting designers and entrepreneurs' cooperation.

During the project implementation, the number of beneficiaries who actually took part in the policy was considerably exceeded. In total, 1348 companies participated in DYP, 709

of which visited DYP's website at least 10 times; workshops were attended by representatives of 111 large companies and 1247 SME's. Total budget of the project amounted to 21.154.470 PLN gross what equals 5.288 k€ gross.
The project "Design Your Profit" provided expertise, methodology and practical solutions in which companies and designers learned how to effectively create innovative product designs and place them on the market. The main objective of the project was to create a professional business environment, conducive to cooperation of entrepreneurs and designers, in the field of industrial design applications.
The project permitted small, medium and large companies in Poland to increase their level of knowledge in the areas:

- Design as a tool of competitiveness, innovation and improving business profitability
- How to market new product designs
- Methods of cooperation with designers

Another important objective was to enhance knowledge and skills of designers in the market context of design and designing (technology, marketing, sales etc.) and cooperation with entrepreneurs.

Beneficiary firms and respondents

Amica Wronki S.A.:
Amica's first gas cooker was produced in Wronki in 1957 and within years the Wronki-based company became a well-known and trusted brand.
Amica's product portfolio currently includes a range of modern, electronically controlled cookers, fridges and washing machines. Its increasingly popular commercial offer includes a broad variety of both freestanding and built-in products as well as vacuum cleaners, irons, kettles and toasters, which perfectly complement the company's core product range. Amica household appliances are now very well known throughout the European market. The company currently exports more than 50% of its production and plans to generate further growth in export sales within the next few years.

Among numerous distinctions in past years, Amica received The Most Trusted Brand award several times in a row.

Asimpex:

Furniture Manufacturer was founded in 1985. The company operates in the B2B sector, mainly producing contract furniture or furniture for pharmacies and public buildings, as well as providing comprehensive furniture and interior-related services. At present, Asimpex employs 60 people. The headquarters and the production plant are located in Dywity near Olsztyn (Warmia and Mazuria region), while the sales and design department is based in Poznań.The company prides itself on advanced production machinery, being able to work in all modern furniture-making technologies.Asimpex employs technology and construction engineers, as well as industrial design graduates.Present operations also include exports, mainly to Scandinavia, Benelux and West African countries.

Marmorin:

Marmorin, created by a family of aristocrats, is an inspiring mixture of the Wielkopolska region's economy with the Polish design thought at their best. Marmorin was established in 1985. A couple of years dedicated to manufacturing countertops from “artificial marble” allowed the company to experiment with production of sinks. First those were bathroom washbasins, then kitchen sinks and shower trays which became products meeting the strictest standards as well as fulfilling the requirements of clients mainly from Western Europe. An important decision was the introduction of the solid surface material used for manufacturing sinks and shower trays and widely appreciated in Europe and the US due to its unique features: freedom and precision of form, colours and luxurious look. In 2011, a range of designer bathtubs expanded Marmorin’s product offer. Owing to investments in expertise and technological facilities, the company obtained a certificate from the German LGA institute, which confirms the ultra-healthy properties of our products. We also have our own research laboratory certified by TUV Rheinland Polska.

Today, Marmorin is a widely known brand - both in Poland and in Europe. It operates two manufacturing plants in southwestern Poland, employing 240 people. The best design traditions have been handed down for 3 generations. The company's current product portfolio includes 600 bathroom washbasins, 200 kitchen sinks, 50 shower trays, and 10

bathtubs. Total annual production amounts to 200 thousand items, 70% of which are exported to 24 different countries. Distribution network in Poland comprises 80 select showrooms, meeting the company's strict criteria.

Mode:lina:

Mode:lina was founded in 2009, in Poznań, by Paweł Garus and Jerzy Woźniak, both formerly members of the Rotterdam-based architectural practice 123DV/Liong Lie (www.123dv.nl).

Mode:lina is the highest quality, out-of-the-box thinking, and attention to detail, professional advice and close cooperation with both our clients and specialists. Mode:lina is projects carried out as tailor-made products for specific requirements and spaces. The road to the most optimal solution is through experiment and testing of different options, using the cutting-edge communication technologies. Company is happy to engage in social projects that promote new trends. They used to work as editors of TAKE ME lifestyle magazine and co-organizers of Pecha Kucha Night in Poznań.

Soul and Mind:

The company has been present on the market for 20 years now. Initially an advertising agency, now it operates in such fields as brand design (mainly), industrial design (for more than 2 years now), and consulting. Company's premises are located in Poznań.

They cooperate with brands likeAmica, Heinz, Maspex, Saint-Gobain, SAB Miller, Johnnie Walker, AMZ Kutno, Autosan, Piotr i Paweł, Monini, US Pharmacia, Nestle, Zelmer, and others.

Beneficiary Firm	**Amica Wronki S.A.**	**Asimpex**	**Marmorin**	**Mode:lina**	**Soul and Mind**
Founded	1957	1985	1985	2009	1992
Industry	Electrical appliance	Pharmacies furniture	Marble manufactures	Design products and spaces	Design services
Turnover before	N/A	N/A	N/A	N/A	N/A

the policy					
Turnover 2011	N/A	N/A	N/A	N/A	N/A
Employees before the policy	N/A	N/A	N/A	N/A	N/A
Employees 2011	1800	60	240	5	35
Markets presence	Europe	Worldwide	Worldwide	Poland	Poland

Table 23 Polish background information of the beneficiaries firms

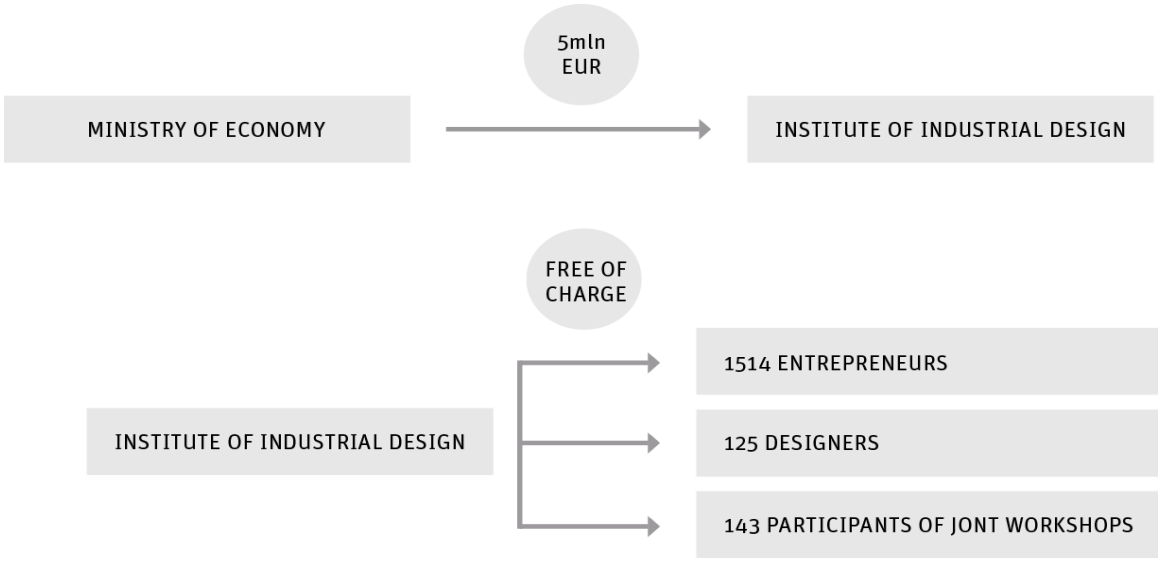

Figure 14 DYP Actors

3.5.2 Description of the Policy Makers and intermediaries

The Institute of Industrial Design:

The Institute of Industrial Design (IWP) was founded in 1950 in Warsaw. It was among the first institutions promoting design in the post-war Europe, established in 1950 in Warsaw. The main objective of the Institute was "...to conduct scientific research work aiming to increase the level of the production aesthetics and devising the guidelines on planned economy within the frames of industrial design". Throughout its activity, the Institute has dealt with the economic aspects of design application: it provided data and orders; it

designed and supplied samples and templates or documentation. It also carried out consultations, design and economic analyses, consultancy work, and provided information on the theory and history of design. Currently, the Institute also advises on design strategies and design management, as well as new product development and implementation; it also prepares and executes competitions for the provision of design services. IWP's clients are mainly large and medium enterprises who want to use design-driven innovation in order to improve their competitive edge. The Institute implements educational projects focusing on design and design management, e.g. trainings for entrepreneurs and post-graduate courses for managers. Since 2006 the IWP has been a member of the International Council of Societies of Industrial Design (ICSID), the international non-profit organization promoting design, associating over 150 institutions from over 50 countries. The ICSID carries our standardization activities, promotes good practices, and supports cooperation between designers and business.

The Marshal's Office of the Wielkopolska Region (UMWW):

The Marshal's Office of the Wielkopolska Region (UMWW) in Poznań is a subsidiary body of the Board and the Marshal (e.g. Governor) of the Wielkopolska Region. The Office comprises 25 departments, which perform their duties in collaboration with the Regional Parliament (Sejmik) and its Committees, the Board, regional government's organizational units, national and regional administration, as well as social and economic organizations. It is an important joint duty of the departments to cooperate with the Regional Treasurer when the budget is drafted and when the budget's execution is verified. The departments initiate collaboration with relevant structures of regional authorities in other countries and with international regional assemblies and associations. The Board (Zarząd) of the Region (Region's executive body) is responsible for implementing tasks of the Region's authorities (other than those reserved for the Regional Parliament and regional organizational units).

3.5.3 Description of the Policy process

Design Your Profit was an open project; there were no restrictions on access. Applications were processed on a first-come-first-served basis. Even though descriptions of target

groups indicated who could benefit the most from participation in workshops, admission to workshops was not determined on that basis. Recruitment involved an online application procedure using forms of the Institute of Industrial Design (IWP). A telemarketing company provided support tools, directing internet users to the website with the application form.

DYP project was implemented all over the country and workshops were held in 15 Polish cities.

Within the DYP project there were prepared for every group profiled trainings and tools helping to understand the positive results that come from the designers' cooperation with a businessman:

1. **Self-assessment survey for companies**: the self-assessment survey is an electronic tool dedicated to polish companies - it offers the possibility of evaluation to which degree a company is organized and prepared for the application of design, taking into consideration the key aspects connected with the process of the development and implementation of a new product.
2. **Workshops for companies**: 2-day cycle in selected Polish cities, in the premises of organizations and institutions who are partners of the project. The scope of the training-methodology was management in the process of implementing new product on the market, including cooperation with designers.
3. **Workshops for designers**: 5-day cycle in selected Polish cities, in the premises of the organizations and institutions who are partners of the project. The scope of the training-methodology was increasing marketing skills and effective cooperation with companies.
4. **Combined workshops for companies and designers**: 3-day cycle in selected Polish cities, in the premises of the organizations and institutions who are partners of the project. The scope of the training-methodology was management in the process of implementing new product on the market, working in interdisciplinary teams and practicing effective cooperation between the designer and the company.
5. **E-learning**: Course of 20 e-learning trainings on the website www.zsz.com.pl.
6. **Manual on the methodology** of managing the process of marketing new products based on design. Topics include the process of preparation, development and product life (from market research to introduction of a new product on the market).

The manual serves as instructions for company design teams and designers. Every participant of the stationary workshops will receive a free copy of the manual.

7. **23 exhibitions** presenting processes and business models connected with the implementation of new products and products designed as reference models were organized in Poland and two abroad in Shanghai (2010) and in Vilnius (2011).

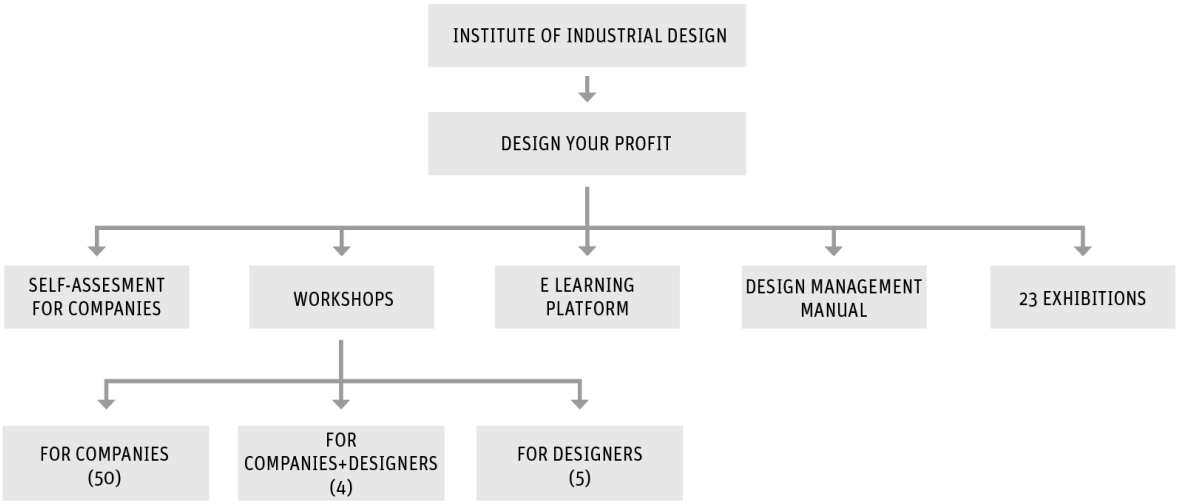

Figure 15 DYP structure

4. Empirical results - Design Impact on SMEs

After the literature analysis and the description of our role within the DeEP project, we came out with the analysis of the results. We notice, once again, that design is a competitive tool, available for the management, that cannot be considered simply aesthetics and style, but that is becoming increasingly important within companies from a competitive point of view.

Our research was mainly conducted in the Italian context in collaboration with the Politecnico di Milano, and it has been enriched thanks to the collaboration of others stakeholders involved in the DeEP project: Lancaster University (LU), Mälardalen University (MDH), Confartigianato Lombardia (CL), The Work Foundation (TWF), Munktell Science Park (MSP), and Pro Design (PD).

We developed with our partners one case study for each policy, interviewing the beneficiaries of the related initiatives: in Italy as we have introduced in the previous chapter the target policy was '**Un designer per le imprese**', in Sweden it was '**Design för export av medicinsk teknik**' (roughly; Design for export of medical technology) that is part of the program '**Design som Utvecklingskraft**' (roughly; Design as a Development Force), in England it was '**Designing Demand**' and in Poland '**Design Your Profit**'.

After the literature analyses we made, based on previous studies and academic discussion on design, two main hypothesis arose we will explain in this section, discuss them and bring empirical evidences about: how design investments impacts on business performances and which are the mediating factors or capabilities (design capabilities) that link design investments and performance improvements for companies (HP1-HP2).

As we have already mentioned in the methodology's chapter, we built a questionnaire addressed to the beneficiaries which has been the starting point for the analysis of results, suitable for the evaluation of the policies impacts, and properly as a starting point we want to present in the following section ours consideration regarding their answers.

4.1 Cross-country evaluation results

In the following chapter we aim to answer to the main hypothesis we made on design, innovation and firm performances, and we want to present the structure we will follow to drive you through the results evaluation. First of all we aim to answer to the first hypothesis we made and to do that we proceed to a cross-country analysis that will consider the case studies we developed within the deep project and refers to them as baseline to test the hypothesis itself. Secondly we face the second hypothesis and in this particular stage we want to explore better and deeper the concept of design capabilities and the concept of absorption, in order to understand how this two concepts are linked to the improvement in companies' performances. We aim also investigate better the concept of design maturity and how this firms' status can be related to the rate of performance improvements that investments can boost.

Starting from the case studies we went through and analysing critically the literature made on the correlation between investments in design and the increase in firms' performances, we try to confirm the hypothesis that drove us into our investigation.

The project we did, enabled us to have an European point of view about the situation of design and particularly related to design investments in Europe, this allowed us to have a lot of extensive and very specific data with which, starting from the Italian case of our expertise, we have built the comments below.

In general the support policies provided in the different countries that we analysed as a form of investment in firms, were perceived in a positive way by beneficiaries of those policies. Although the budget of the policy was significantly different across the analysed countries, the impact of this investment, both financial and non-financial, was highlighted by the results that firms obtained after the policy and by the evaluation made on the firms themselves.

The Swedish Policy:

We can start introducing the Swedish case study, we investigated within the DeEP project that will help us to evaluate results and make comparison useful for our research. We aim to understand also from this research, how beneficiaries perceived the support they received and how this particular kind of design investment affected their performances. Beneficiaries did initially seem to associate "results/effects" to primarily tangible and

short-term effects, more intangible and long-term effects as "side effects" or "unintended". Beneficiaries initially stated that their participation in the project lead to no results and this at the beginning seemed us strange compared to what we evidenced in the Italian interviews, but later they referred to the policy as a starting point where they learned new methods, ways to work and think about design that lead to good and tangible results. These results were a direct effect of what they learned in the support policy and they said it had a great impact on them.

All the beneficiaries stressed the positive impact on their results and on their view that investment received and the participation in the support policy. This for us make clear how increase in performance in the short term is boosted by design practices that takes place within the policy initiative and in the medium-long term by a change in the mind-set and in the company's perception of design and its role.

The UK Policy:

We come through the UK case study, as we said above, introducing different policies (we mean different way to invest in design practices) is necessary in order to present results and make assumptions that can be sustained by facts and data.

In UK, as a public body and now as a registered charity, the Design Council has had a significant number of evaluations made of the organization and the program it has managed. The evaluations have used different methods and different KPIs to carry it out in order to understand how support targeted to firms had impacted on them. However, the majority of the evaluations have looked at some common key aspects of measurement. The effectiveness of Designing Demand, the project analysed in the UK case study, is also assessed according to the following criteria, including:

1. Raising the profile of design within businesses; influencing current and future investment by SMEs in design; and leaving a design management legacy which enables the business to feel confident in managing future design initiatives;
2. Measurable business growth, including current and future job creation, current and future jobs protected sales, profits, actual/anticipated new product/service development; increased market share; etc. In determining these factors, particular consideration is attributed to determining the net impact of the programme. This is

defined as the benefit across the companies that happened as a direct result of the policy that would not have occurred otherwise;

3. More confidence in procuring design advice prior to the policy, participating companies were either not that confident or would not know where to begin in procuring design support. After the initiative, respondents felt very confident that they could procure design support without outside help, or felt confident about doing so although recognised that they would benefit from additional support;
4. Increased understanding of senior managers of SMEs to identify strategic design opportunities respondents either strongly agreed or agreed that they are more capable of spotting design opportunities within their company as a result of investment in design;
5. Senior managers are capable of writing briefs and hiring designers.

Major results from the abovementioned evaluations are as follows:

1. Technology campaign impact update: From the twenty technology ventures that participated in the Innovate pilot programme (the Technology Campaign), the overall beneficial impact was on:
    i. Stronger business proposition
    ii. Enhanced income and survival prospects
    iii. Shorter time to market
    iv. Alignment of products and services with customers' needs

2. The evaluation of the performance of the Design Immersion Program and its benefits to ceramics companies:
    i. Turnover increased by 14 per cent above earlier predicted levels
    ii. Profit increased 9 per cent above earlier predicted levels
    iii. Employment increased 13 per cent above earlier predicted levels

Length of time after engagement (years)	Business Benefits (survey)	Qualitative Benefits (case studies)
0-1	The only business benefit reported in the first year after engaging with Immerse was one company stating that brand awareness had improved. No increases in sales, profits or market share were recorded, reflecting both the duration of Immerse interventions and the fact that it has not been designed as a 'quick fix' solution.	Project design and implementation
1-2	Two companies reported increasing market share, entering new markets and increasing sales. Profit increases were recorded by one company.	Project design and implementation
2-3	This is the period when business benefits have been most likely to occur, especially in the first six months, ie 2-2.5 years after engagement. Four companies increased market share, two entered new markets, two increased sales and two increased profits.	Period when profitability appears to improve and a design culture starts to become embedded.
3-4	No business benefits were recorded in this period.	Anecdotal evidence of more sophisticated design, branding and market share with increased design related experience.
4-5	Limited business benefits—one company reported an increase in profits and one reported improved brand awareness.	
5+	Examples of business benefits across most categories although only by one company in each.	Longer-term cultural change.

Figure 16 Summary findings on the timing of immerse benefits

Besides the national level evaluations, the RDAs also carried out their own evaluations that gave very interesting insights and the measuring criteria. These evaluations were conducted at regional level and hence the data and sample used were confined to that particular region, but here is not the place where report them.

Now that we presented and introduced above the projects that underpin the case studies we used for our research we can go in depth and use the data gathered in those researches in order to answer to the hypothesis arose on design, innovation and firm's performances.

The Polish Policy:

We can continue on introducing the polish case study. The polish policy had different structure and different dimension than the Swedish and Italian ones, previously presented, and this variety of design investments help us to have a broad understanding of the correlation between design and firm's improvement in performances. The main objective of the project in the polish case was to create a professional business environment, conductive to cooperation of entrepreneurs and designers, in the field of industrial design applications and the policy, recalling firms' feedback and data achieved a number of results as:

1. Preparation and implementation of professional methodology for developing and launching industrial design, which would translate into standardized rules as well as stabilized level and scope of design services. Therefore, conditions would improve for the diffusion of process and organizational innovation.
2. Facilitation of access to knowledge and good practices, resulting in better use of current possibilities of innovating by design; in effect, Polish economy would enjoy stronger product innovation.
3. Creation and launch of an information platform that would enhance networking efficiency, exchange of experiences, joint customer service, and development of pro-innovative offers.
4. Studies on design effectiveness, studies on project effectiveness, offer monitoring. The implementation of the above-listed goals enabled small, medium and large Polish enterprises to raise their level of knowledge on:
    - Design as a tool supporting competitiveness, innovation and profitability
    - Methods of launching newly-designed products
    - Methods of cooperation with designers

The policy effectively improved designers' knowledge and skills regarding the market-related contexts of design (technology, marketing, sales) and cooperation with entrepreneurs. It also allowed to establish networks of partner collaboration, involving various Polish and foreign institutions. Finally, it helped educate them in the area of supporting cooperation between designers and entrepreneurs enabling and enforcing the companies' opportunities in term of design practices and innovation activities.

To sum up, the project presented in the polish case study is worth continuing, because it raised the awareness of design (although still not enough). Currently, the focus is placed on pro-innovative activities (implemented by the government, EU, and local authorities). Design and design management is defined and understood as a tool for increasing innovativeness in all aspects (both product and process innovation), and providing support for activities undertaken by firms that want to invest in those resources and practices.

The value of the project was appreciated by designers and firms whose interest in participation greatly exceeded initial expectations and assumptions. According to them, the workshops were important because 'such knowledge (on business-oriented offer

preparation, communication and collaboration methods with business) is nowadays a driver in the implementation of design practices in companies' processes.

The project also showed lack of a polish platform connecting the communities of entrepreneurs and designers. This opportunity was indeed offered by it. The workshops were valuable in terms of content, but most importantly, their participants had a chance to establish new contacts and initiate a dialogue: designer – entrepreneur (as we see also before in the Swedish case study).

Some of entrepreneurs engaged in new forms of collaboration with designers thanks to the project. A company for example decided after the participation to send the entire product management team to a postgraduate course in design management.

The development of soft skills was positively evaluated. In one of the companies, during the first project involving a designer, the payback period (return on investment) was less than 1 year.

4.2 Design Inputs and Innovation Outputs

We start from the first hypothesis, which emerged during literature review and the analyses of previous studies and academic papers on design investments and innovation. We want to verify the assumption that for each € invested in design activities firms will experience an impact and an improvement on innovation outcomes or results, that boosts and improve firms' performances. We know that there are overlaps between design management studies and strategic management studies, when design is being viewed as a strategic resource and more specifically that there are overlaps between innovation and design studies about the notion of learning as a prerequisite for design and innovation processes (Utterback et al., 2002). Starting from this consciousness, we can exemplify what we hypothesized, that when you invest in design, as the case of design support policy, you are investing on innovation and you must consider the outcome of both in order to investigate the improvement in firms' competitive performances.

The C.E.O of MC gave an example of how support policies have been perceived in their impact on firms in the following statement: *"The increasing number of firms applying for the support policy and the significant number of projects that completed their path from design to production, certifies effectiveness of the policy in terms of impact on innovation*

and design management" [Emilio Genovesi - Material ConneXtion]. The Swedish case study exemplifies how "you can innovate through design practices and design methods to gain a competitive and sustainable advantage" and how this was perceived as a side effect of investments in design and not as a direct effect. This is very important because makes clear why design investments always have suffered by a lack of common language and a great rate of ambiguity is important instead understand that nowadays when we talk about design we talk about a driver that enables innovation and allow gaining that competitive advantage we referred above.
Beneficiaries, in the Swedish case report, sometimes made a difference between what they considered "official" and "unofficial" effects, support, purpose and goals. Sometimes referring to something as not to being "real" support, "probably not the intended purpose of the project" and as "side effects".

All of the interviewed beneficiaries recalled the networking with other firms from the same business as one of the most valuable elements of the project. Despite that access to the network was received through the project, the network was not referred to as received support. Neither did any of the beneficiaries refer to the help to search a design bureau with a specialization that matched the needs of the company as support received. Beneficiaries often remembered what they considered "not real support-activities/effects" better than the "real" support. They also reported that the side effects they recall as very relevant were those soft skills and resources that can be compared to the mind-set of a firm and that enabled them to have a new perception of design and innovation. More, we can add that they saw the improvement in their innovation activities because of a change in their view. The fact that Swedish beneficiaries stressed that they received design support but they experienced changes in the way the manage innovation is for us an exemplification of how design investments are deeply linked with innovation processes and are one of the main driver that nowadays can lead to a competitive advantage in term of innovation effectiveness for enterprises. We must say that the connection design-innovation and the impact that design investments have on firms' innovativeness and on companies' performances, when we talk specifically about investments, can be clearly perceived by the answers firms provided to the questionnaire that aimed to investigate this specific impact. The firms involved in the support policies applied with different objectives

and goals: *"Main purpose with our participation was to develop a new product"* [Olof Eklund - Camp Scandinavia] or *"The goal is to increase employees' strategic competences, for us it meant acquiring new information and knowledge about design"* [Radosław Czarnecki - Amica]; and this makes or research even more interesting and permit to investigate the impact that those investments in design had in companies, avoiding adverse selection problems that may appear.

The topic we talked about in the previous paragraph emerges from Tambascia answer: *"When we received news of the initiative (newsletter), we found out it was an interesting twofold occasion: on one hand it was possible for us to meet new designers to be involved not only for the specific project but also for the future; on the other hand there was the opportunity to work with Material Connexion and then have access to a database of materials to specifically address the problems involved in the creation of protections".* Despite that many others enterprises perceive the opportunity to deploy and go ahead with pasts projects through the participation in it. This was confirmed by companies such as Leone1947: *"We wanted to use this chance to see if we could do something different than what we did so well in all these years";* and Sonnomedica, a medical services' company: *"We had a project we were not able to complete yet because of time and the daily-life business, but we saw in this policy an opportunity to develop it and maybe try to realise it. We were impressed by the collaboration with Design Schools; we had so low expectations about the application of a design approach to our innovation process that the results were just stunning for us".*

It was an opportunity too also for Tucano Urbano that stated: *"There was the opportunity to involve external resources on this project that internally we could not carry on due to lack of time and priority".*

Different feedbacks come from the marble company MerliMarmi that "needed" an external point of view, so 'Un designer per le imprese' has been seen as an opportunity in this sense: *"We said: we have new collection, a new vision and a new way of working, let's try to complete this transformation with an external point of view, external not only compared to the company but also to the industry. We had to question ourselves on the actual goodness of our products. We wanted to have a feedback on our path using a new point of*

view, a not affected or influenced one. We could have the opportunity to work with resources that difficultly would look at a small reality as our firm is. After this Paolo Merli the owner and manager of the enterprises continued: *"The impact with students was great and positive; they provided an original view on the marble industry and products you can create with this great material".*

We can do many considerations, starting from the Italian case study, the first and obvious is the evolution of policy summarized by the variation of the budget made available by the CCIAA, in particular the reduction of funds required for the implementation of the policy through improved efficiency and best practices on the part of the promoters (see Appendix).

We always see the funds of policies as a proxy of investments that serves as an input for the firm, and more, we want to stress that those kinds of investments are relevant in our research because they are specifically targeted for design activities and this makes clearer what we mean when we talk about design investments. As we can see from the Italian case study, the specific segmentation of these funds allows us to catalogue them and avoid ambiguity, and makes clear the relationship between design investments and innovation outputs. This linkage can be evidenced by an impact that those investments had on the mind-set of firms the U.K interviewed explain that companies has expanded their "design horizons" as a result of the support policy. Firms that were in contact with support policies went from a relatively "tight" or technical view of design to appreciate the more 'intangible' aspects of design, in fact, it emerges from the interviews made to beneficiaries companies, they are *"Starting to think about innovation, processes and needs of customers in a different way"*. In some industries the role of design is known and widely used, but in others is still lacking and investments could drove it to a great change in innovation practices and a consequent improvement of performances. As veronica Masiero (Leone 1947) said: "*I think that the main change we experienced was the one in our mind, in our way of working and approaching the development of new collections of products. We focused more on our market and I can say we learned a lot about our customers. This policy made us more aware about it"*. That happens in many companies, some of which also started new collaborations with young designers after the policy: *"We have started a*

fruitful experience and collaboration with the designer we selected for our brief and we designed all the new line of products with his help". [Veronica Masiero – Leone 1947]

Investments in design lead to a different perception of its meaning and of innovation as stated by Jonas Jähkel of Permobil: *"Yes, we used to add design as styling in our projects, now design is innovation and business development, design as styling have practically disappeared*" and more *"Design is used in broader sense than before, to a larger extent used as part of innovation regarding development of user interface in software, webpage, physical form of products of course"*.

Some of them reported also a direct relation between design support and innovation that lead to an increase in competitiveness, and this makes our assumption stronger, as Joanna Szozda of Asimpex said: "*Yes, I did change some actions and sequences of steps in the design and implementation process. We have implemented briefing and brainstorming; we have also improved the effectiveness of teamwork between technology engineers, constructors and designers. During the policy, I learned about the sequence of stages in new product implementation projects, design briefing methods, as well as general cooperation and communication with designers. These changes impacted and improved our innovation process"*.

Investments in design are useful because they increase the opportunity for companies, to take advantage of new resources for innovation. As we reported above, design investments enables firms' relationships of mutual exchange between education world and business world boosting performances. As reported in the Swedish case study: *"We did somehow develop a new approach/mind-set about how to handle things, which in a way have influenced they work in one way or another ever since. It was something that somehow pushed and boosted our perception of innovation in a direction even though that was not the main purpose of the policy"*. [Johan Henningsson – Arcoma].

The second major point we want to touch is how firms can take advantage of those resources and of those investments; as reported by the head of product management of Amica, Radosław Czarnecki: "*This initiative allowed me to explore working tools and methodologies".* This introduces our study on design capabilities and how they are related to working processes of firms.

4.3 Design Inputs and Capabilities Growth

Here we come to the second hypothesis we made: the existence of five design capabilities that impacts on firm's performances and that are enabled by design investments. In order to study what we called "absorption" in term of design capabilities, and how those capabilities act together in the increase of a company's performance, we have to define also which the objectives of the policy were and how they are aligned with the company's performance or increase in performance.

The beneficiaries' questionnaire used for the evaluation of the firms' design impacts is structured in three main sections: A, B and C. The first one wants to explore the ex-ante situation of the firm and understand how the policy works and its implementation. The second one, section B, aims to investigate the improving or not in Design Capabilities at the end of the support policy, and the third one wants to take into consideration the design maturity level of the firm.

Since the focus of our study is on firms, on their capabilities and on how design investments can impact in the increase of those capabilities, is for us very relevant be able to measure and verify those results. In a certain sense, measure the impact and the results of investments. Measuring that impact means be able to evaluate support policies, that we see as particular investment, in order to investigate the effectiveness and the efficiency of investments and to study the increase in capabilities an enterprise can gain.

In the Italian study we can see that Roberto Calugi, director of CCIA evaluated in this way the policy: "*There are more enterprises every edition that wants to apply for the project and we have prototypes that became final products after the policy process. These are indicators of the policy success. The evaluation of the policy from my point of view can be done by one indicator: how many projects end with a product launched in the market. For me this is the only aspect or the main aspect that matters*". From this particular answer we can see that policy makers often require a very low threshold and this can impact on the efficiency of design investments and particularly on the efficiency of support policies. Will be very important in future; align the design of a support policy to the results in term of capabilities that enterprises should gain through investments.

As a starting point of our analysis, we derived that many companies were a little bit sceptical in applying to the policy, mainly because they did not have confidence with that

kind of support and maybe they also underrated the real value of design in the business' areas. Usually this feeling was due to previous and unfruitful collaborations with designers; some companies said that: *" We had collaboration with a designer before the policy, but it was not a positive experience, we were sceptical about this kind of external competences"* [Veronica Masiero - Leone 1947]. Many did not have high expectations and were not even sure about being selected, but the main barrier was the mistrust about design usefulness: *"We had collaboration with an external designer, the result was negative. We completely mistake the target market of that product"* [Paolo Merli - MerliMarmi].

From the Italian case study we can highlight how the results of investments in design "are positive; the indicators show a growing trend year after year: more companies want to participate, more projects are developed and many of these are prototyped and then produced." reported us Material ConneXion. This positive impact, that investments have on firms is stressed also in the polish case study by Soul and Mind: *"The involvement in this project became the first impulse for change and eventually triggered the search for new ways to develop industrial design competences"* [Milena Kołodziejczyk – Marmorin] in relation also to the firm's mind-set. Moreover, this can be evidenced, again in the Italian case study, by the growing interest of major public subjects (Municipality of Milan) in the project that confirms its effectiveness and underlines the future improvements that institutions can make on it.

The same judgment about investments and the perception of investments can be found also in the other case studies, if companies are asked about their current relationship with design they present an improved situation than the one in the past, as in the polish evaluation, the marketing director of Marmorin said: *"The company collaborates with both external and in-house designers on a regular basis, participates in design competitions, exhibits its products at trade shows and design exhibitions"*. [Milena Kołodziejczyk – Marmorin].

The concept of absorption and its correlation with design capabilities result even more evident if we go through the analysis, in our research we noticed that firms were aware about changes they experienced in their business, in their processes or in the way the developed products and innovate, but they were at the same time unable to explain what changed. In the polish evaluation one of the beneficiaries gave insight about the change of

perspective we introduced above: *"The company has a constant relationship with design now. What I actually liked and implemented was the way of talking to an employee. We keep evolving at various stages of business operations; each project certainly changes us, develops our awareness, and teaches us how to apply new knowledge or do the same things in new (improved) ways. For us, participation in such initiative can even change our attitude to hiring people, drawing up contracts, or dealing with other formal and organizational business issues. The new approach to design does not necessarily have to revolve around styling and designing"* [Jerzy Woźniak - mode:lina]. This is an example of what they meant for improvements in their daily business, we targeted a general feeling of improvement trying to figure out what underpin it.

At the end of the gathering of the answers provided by the firms we are able to make some consideration about what happened in term of design capabilities improving consequently to the support provided.

The results in terms of design skills were beyond the expectation of the companies as many interviewed stated. First, as we mentioned beforehand the opportunity to have "fresh" ideas from young designers was conveyed as a tool to leverage design capabilities in firms. We constructed the questionnaire just on this topic, to become known how this kind of support could give a boost in design capabilities increasing. What happened after the end of the firms participation to the policy in terms of improving design capabilities is clarified once again by Camp Scandinavia: "*The project helped us clarified the question of design and lifted the "design-parameters". We have employed a designer and design has thereby taken a more natural part of our product development process*" [Olof Ekdal - Camp Scandinavia]. We have some answers that can be connect for example to design capability N.1 *Holistic view,* like Marco Caglieris from Sonnomedica reported: *"(…) absolutely not, we did not think about design from this point of view before. We always saw design as something that was useful just for manufacturing enterprises. We understand that design can be useful also in our sector, in services we provide, the design approach can be an effective tool or methodology".*

Alternatively, even what is reported from Paolo Merli (MerliMarmi): *"I would not say that something really changed in our process, but obviously changed the approach we have to*

design"; we indeed described *holistic view* as the capability of a firm to manage design as a whole process deeply linked to the firm's strategy and the medium-long period planning.
In firms such Leone1947 we perceived one of the most radical change made by the support given: *"We developed a new pair of boxing gloves different in colours, that cannot be used in regular matches, but we sold a lot of them because our customers use the boxing gloves in different activities, like fitness matches, where more attention is given to the appearance and less to the rules. This became our new market"* [Veronica Masiero - Leone1947].
Similar feedbacks can be evidenced in the Swedish answers: *"We perceive design as a more important parameter in their work today"* [Olof Eklund - Camp Scandinavia]; or even when we asked to firms like Permobil if they think have learned to approach innovation from new perspective, how changed the approach *"Yes, we have a holistic view on design today*" [Jonas Jähkel - Permobil].

We found a good revelation of leverage design knowledge like *How People Give Meaning to Things* (design capability N.2) reported in one of the most recurring statement granted: **"***After this experience we are more aligned with our market; design helped us to visualize our strategies."* The market insight given by the design approach confirm the growing capability of the firm in perceive how customer will appoint value in their products. This is confirmed by Mirko Tambascia: *"(...) the relationship is changing, before the entrepreneurs were taking all the decisions on how to make their products, after the policy we carry on the new concept with a market sight, in a more systematic way".*
Others confirmations of what reported above come from the Swedish reports: *"Thanks to the project a better understanding of a very complex structure of needs of users, buyers etc. was achieved"* [Jonas Jähkel – Permobil].
From Asimpex the interviewed Joanna Szozda gave insight on how this knowledge could be leverage using design also in a B2B reality where every client brings a new experience and she added: "*There are no "easy" clients, in my opinion. Such projects as Design Your Profit help promote business culture and teach an individual approach to a client"*; design supported the company learning more about end customers primarily from their B2B clients from Western Europe.
The U.K interviews explain that the product design project will certainly make the benefits of additive manufacture available to customers in the form of resource-efficient, quicker

manufacture and new previously 'impossible-to-produce-conventionally' designs. Given that the company provides bespoke solutions to customer problems, this capability is anticipated to be well received.

In following statements we have examples of improvement in design capabilities N.3 *Applying New Technologies* or even N.4 *Visualizing and Materializing*: *"The technology plays a limited role in Leone's business, but the visualization of new services and new ideas had been improved by the policy"* [Veronica Masiero - Leone1947].
"Federico was innovative because, being able to use the university laboratories, he made a prototype in 'Stereo', a moulding 3d technology, which is a technology that we do not have in-house and certainly will use in the future. We understood the potential of technologies like this in term of visualisation" [Mirko Tambascia - TucanoUrbano].
Interesting insight come out from the polish evaluation, where the interviewed Milena Kołodziejczyk marketing director of Marmorin reported the improving in visualizations' skills: "*Designers' competences are developing substantially, so the company can offer better and better visualizations generated with professional software".*
The Swedish evaluation reveals how the changes enabled by design investments can be targeted, as we reported, on a specific capability: "*Our approach has also broadened to include more of the "visual" design and not only the function-driven design"* [Olof Ekdal - Camp Scandinavia].

Moving forward within the analysis concerning design capability N.5 *Managing the Design Process*, we could link many answers to what happened in the developing new concepts after the policy. The other aspect was the crucial design management role, without which neither project would have been undertaken. Many changes were introduced in the new product development process: *"It was the first time we tried a product development this way"* [Mirko Tambascia - TucanoUrbano].
The most upsetting results were achieved by service firms as Sonnomedica, as the interviewed Marco Caglieris reported: *"(…) we are a service-centred enterprise, for us this way of innovating is uncommon, we usually did not pursue this path. For us was quite a step, because it changed the way we usually approach the process of definition of a new*

concept and this project forced us to review our internal processes and to evaluate them in term of compliance to final users.
The project manager of Soul and Mind stated: "*The purpose of the initiative was to acquire knowledge on design project management developing know-how in managing industrial design projects. We were interested in the process of execution of the project, so it was important to assimilate how projects run in industrial design reality"* [Bartosz Mikosz - Soul and Mind].

Due to the Swedish evaluator (Ulla Johansson) we can stress that one of the most interesting results was a new way of perceiving design, they said they have developed "design thinking". Interviews with various stakeholders revealed that the vision and the design approach of policy makers and businesses are different for some aspects. We have seen that the promoters Chamber of Commerce and MC are more "design-oriented". That means they have always interpreted the design not as just an aesthetic tool, but mainly a competitive one to invest on. On the other hand, companies except those that already were collaborating with designers, were more interested in getting feedbacks from students about their product concepts and obviously to get "fresh" ideas not influenced by the company's environment.
In general, the companies expressed their satisfaction for their participation into the policy and for the accomplishment according to their requirements of prototypes and innovative concepts. One aspect that has been reported several times was that firms did not exploit as much as they would the library materials that MC has put at disposal of students. The main reason was the non-feasibility of the concepts from the economic point of view because of the not sustainable cost of these new materials.

Another aspect that emerged from the interviews with the beneficiaries was the fact that the companies have received interesting projects from some groups but also poor projects completely out of focus and not coherent with the initial brief from others. The high variability in term of project output and concepts quality could be influenced by the role of university tutors and by the capabilities of few of the involved students, we suppose the absence of their support and also the misuse of meetings between teams and companies. In

some specific briefs the absence of production and price constraints caused problems for students in the concept development leading to low quality projects.

Another critical point particularly stressed by micro-firms was need of support also in the final part of the project, the prototype development phase and the commercialization. These particular companies due to their limited internal resources needed a specific support in order to appropriate the results of the policy that is why we want to stress that a specific commitment of MC in that particular part of the project could be very useful in term of absorption for those firms.

Finally after one year from the closing moment of the policy, which is the Triennale Exhibition, we can underline a different approach to design developed by companies involved into the policy. They stated that they would likely participate to other initiative on the same topic and with the same scheme, and this is because they understood the importance of design as a strategic lever for global and sustainable competition. This is the more important result we can and we must highlight in order to make evident the correlation existing between design and innovation; firm perceived the importance of design practices and design awareness to be successful in the today competitive market.

Another strength stressed by firms during the interviews was the positive aspect of being able to collaborate with skilled resources with deep design knowledge for the concept development. Specifically for those "work-intensive" firms used to approach in an iterative and repetitive way the new products development process, the collaboration with "knowledge-intensive" resources brought in a great number of innovative ideas that modified their approach to it interiorizing an external point of view.

A third central point is the change of perspective related to relations between companies and educational institutions. The evaluation emerged from many interviews is the willingness of many firms to collaborate in future with designers and academic environment.
The consideration we have about funds and financial support is that direct money transferred to companies are not effective in term of absorption empowerment and in term

of creation of new design capabilities. From the comparison of this policy with the 'Decò Ter' regional policy, we can observe that direct funding of new product development projects can be less effective than other indirect strategies in term of absorption empowerment and in term of creation of new design capabilities. From what we have been told regarding the 'Decò Ter' policy, this kind of initiatives allow opportunistic behaviours (e.g. underinvestment in the specific project) that translate in lower impact in terms of design capabilities. 'Un designer per le imprese' on the contrary aimed at promoting the collaboration to develop new products and promote the development of capabilities and new knowledge.

4.4 The Model of Absorption

This chapter aims to go in depth with some observations that we derived from an analysis done on the case studies we have presented; specifically in the following section, we will explain our assumption as an empirical model. The hypothesis (HP2) on which we have based our work is concentrated on the existence of a correlation between design investment and performances growth of firms; specifically, we need to prove how this correlation exists.

On this issue, we focused on the concept of "Design Capabilities Absorption". For all the results obtained from the support policy mentioned above, it is likely to say that the link between the two dimensions exists and is relevant in terms of business strategy. It is also interesting to see how different policies have given different results compared to the same theme; this convinces us even more of the goodness of the distinction of design in a set of design capabilities that may be impacted differently by different modes of investment.

We perceived the importance of this specific aspect of our research and we decided to propose an original model that aims to investigate the "absorption" linked to design capabilities. We called this model the "Model of Absorption".

We started from the Design Management Absorption Model (DMAM) proposed by Acklin (Acklin 2011, based on Zahra & George, 2002; see Figure 16) who wants to describe and measure the absorption process of design knowledge by SMEs with little or no prior design experience. Acklin proposed two design management capabilities: *design leadership* and *design management*. She conceptualises the first one as the faculties in searching new

business opportunities viewing design as part of company strategy, and the second one *design management* as an 'organisational capability' that facilitates the absorption of new design resources and leverages new design knowledge to achieve competitive advantage. (Based on Zahra & George, 2002). Acklin confirms this in her statement: *"While a sustained relationship with designers will support a more profound understanding of a design ways of knowing and doing things, design management capability on the side of the SMEs will leverage design knowledge in a way appropriate to a company's specific context and challenges"*.

We found in what Acklin defined as *design knowledge*, a linkage with our *design capabilities* (DC) we have previously recognized in three macro areas: *Design Leadership*, *Design Management*, *Design Execution* (see literature chapter).

In the prototype of the DMAM Acklin reports as this retention of knowledge within the firm can be reached thanks to the support of the design management capabilities through the four stages of *Acquire*, *Assimilate*, *Transform* and *Exploit* of the mentioned skills. For better understanding, we report the definition of these four stages given by Acklin:

1. *Acquire*: Identification of specific design contribution to company, that consists of recognizing the potential of design as a strategic resource;
2. *Assimilate*: Combination of new design knowledge to goals and processes, entails a deeper understanding of the new design knowledge by connecting it to company goals;
3. *Transform*: Deployment of design knowledge and improvement through building design management capabilities and using design tools to improve all customer touch points such as products, brands, services, communication or processes such as NPD or innovation processes;
4. *Exploit*: Company-wide implementation of new knowledge, will involve the implementation of the design resources through integrating design into processes, co-ordinating functions, aligning core values and training the staff. It gets evident that design is not a one-time activity but needs further investments.

The first part of the absorption process is evaluating design as a complementary form of knowledge. We studied how knowledge brokers such as knowledge transfer programmes

of universities or design support programmes play a role in the sensitisation of SMEs together with firms' peers that already use design and demonstrate its effectiveness.

Once the entry barrier has been overcome, the *acquisition* of design knowledge is supported by making design a strategic issue and raising it from a styling activity to the level of company objectives. During this phase, it is important that design knowledge can be related to prior expertise and capabilities like brand strategy or product development.

Talking about the *assimilation,* an obstacle in this phase could be the difficulty to gain an overview over the offer of the design industry and to identify the "right designer" for the project. In a certain way that is what has emerged from some interviews, where companies have received interesting projects from some groups but also poor projects completely out of focus and not coherent with the initial brief from others. As we have already explained, the high variability in term of project quality could be influenced by the role of university tutors, by the expertise of the involved students or the misuse of meetings between teams and companies.

During the *transformation*, design knowledge is connected to the doing of things (iterative processes), some of it tacit such as the concept of product language or aesthetics, has to be absorbed. This phase can result in confusion, miscommunication between designers and company stakeholders and even distrust (Acklin 2011).

In the *exploitation phase,* it becomes obvious to SMEs that design will have to become a company strategy to enfold its full potential and a strategic tool to leverage in for gaining in competitiveness and not just a one-time activity. In this change of perspective matured by firms, it become obvious that they might include more investment of financial and human resources in a long-term time frame. If exploitation of design knowledge is taken seriously, it is probable that the new design knowledge, overtime, will shape routines and that design management will become a dynamic capability.

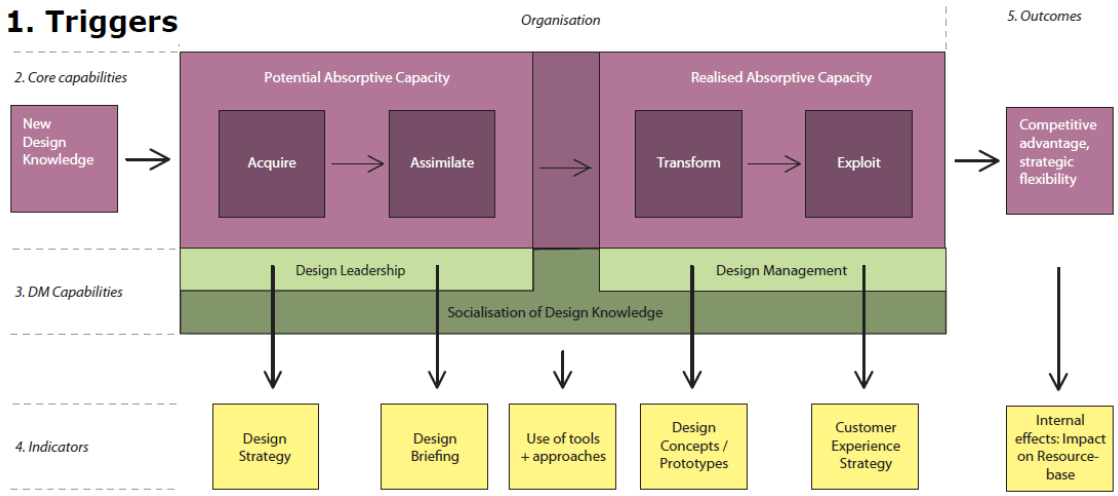

Figure 17 Prototype Design Management Absorption Model by Acklin

From strategic management studies, Amit and Schoenmaker (1993) clarify the distinction between resources and capabilities: 'Capabilities are the capacity to deploy the resources; like resources, these capabilities are firm-specific and are developed over a longer period of time through learning processes'.

With that in mind and the capabilities' description, the underlying goal of our study is to detect the variation of these firms' skills and the related deviations because of investment in design. Precisely for this reason, we define according to Cohen and Levinthal (1990), the absorptive capacity (ACAP) as 'the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends'. Going in depth whit the literature about the absorption capacity of firms, Zahra and George (2002) distinguish potential capacity (PACAP), the ability to acquire and assimilate knowledge, from realized capacity (RACAP) as the ability to transform and exploit new knowledge. In the DMAM model Acklin defines *Design Leadership (DL)* as the "hunting ground"; and *Design Management (DM)* as "facilitators" of project development. According with this specification DL capabilities are involved during PACAP; instead DM capabilities mainly during RAPAC.

From these definitions a first critical emerges, it concerns that is not enough for a firm to acquire new skills, but it is necessary to convert these into *best practices* through the absorption and exploitation process. In fact, while PACAP makes a company susceptible to learning, RACAP enables the company to leverage PACAP.

A second critical emerged during the project affects the common experience of design practitioners and of past and on-going applied research (Acklin and Hugentobler, 2008; Acklin, 2010, 2011) on SMEs. We have found that SMEs will reject the idea of integrating design into their new product development projects or often abandon it early on. This is explained by time or money constraints by small companies, but often points to a deeper chasm between engineering and design or management and design values and their ways of "handling things".

As we reported above is confirmed by an empirical French study on companies from various industry, which explore the difference between design knowledge (what we called as capabilities) and engineering or marketing knowledge during the absorption process in new product development. It came up with two main aspects: first of all that companies perceived design as related to an individual designer or architect rather than embedded to a collective as in their firms, and the second one concern the way of thinking of the designers, who are inclined to use divergent thinking rather than convergent. Designers rather strive on creative exploration, while, for example, engineers work on well specified problems (Abecassis-Moedas & Mahmoud-Jouini, 2008).

After having presented the Acklin's DMAM as our starting point, we run out with a simplified model we have developed during the DeEP project, "Model of Absorption", to highlight the absorption process and integrated this model with the one proposed by Acklin lead to the model presented in the figure below.

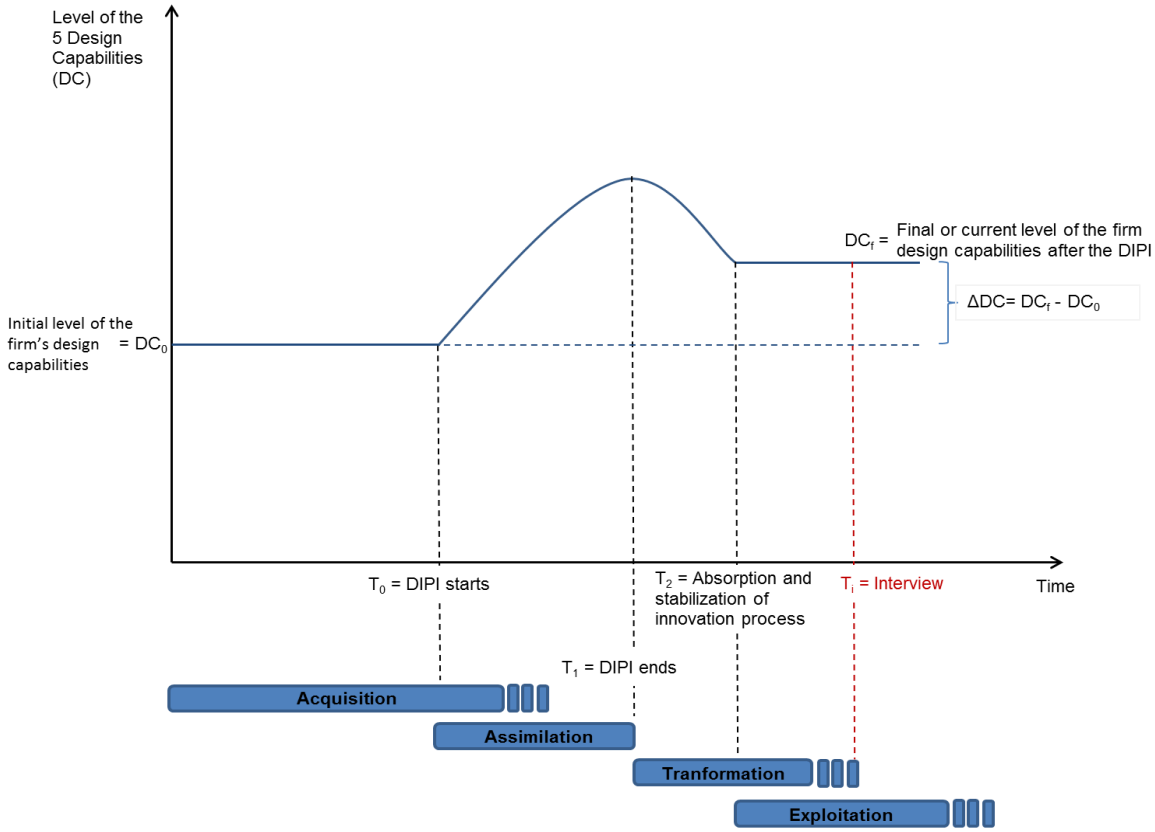

Figure 18 The Model of Absorption

The above diagram shows the trend over time of the curve of the design capabilities of a general company before, during and after his participation in a design policy. In this simplified model a correspondence is supposed between the start of the policy and the impacts it has on the firm.

In the diagram is showed how the level of the design capabilities could evolve over time and is highlighted an increase of these skills resulting in a final ΔDC obtained thanks to the transformation and exploitation of these capabilities by the firm.

As it is possible to see on the y-axis we put the starting level of the firm's capabilities (DC_0), in other words the prior knowledge and the familiarity with design capabilities, therefore the know how accumulated over time within the company itself. Precisely for this reason, different companies will have different starting point of design expertise in connection with the previous investment in design made before the target period of our analysis, until a limit value $DC_0=0$ in the case of complete absence of such skills.

The central topic that the resulting model addresses and analyses is the capacity of the design investments to help enterprises with less or no design experience improving knowledge and process skills. The term introduced is "Absorption" which we defined as a process that is more than learning, it is learning and retaining the knowledge, being able to re-use it. Absorption applies to firms, ecosystem organizations and policy makers; the absorption level is the impact on the development of design capabilities at the end of the policy.

In the presented model we assume that the absorption level will change from different company, but that it will maintain the same trend regardless of the circumstances. It will reach its maximum close to the transformation phase and then it will stabilize until the "exploitation" of those skills that will remain in the company even after the policy.

The initial boost to the design capabilities growth will be given by the firms' participation in an initiative on design, but it should have to be supported with investments made by the company itself to complete the exploitation of the knowledge. We have supposed that the maximum design value will be reached between the third and fourth phase of Ackiln's framework, actually in correspondence of the second half of the policy during the prototyping phases and in some cases in the put on the market of the new product made. This is because it is precisely in those phases that what has been learned previously is translated in an operational tool.

The recognition of the results that have led to the development of the model is identified as the $T_{interview}$, at which time, at a sufficient distance from the end of the policy, we have interviewed the beneficiaries.

4.4.1 Interpretation of the model's variables

The DIPI represents the design policy, we considered it as the main support firms have for design capabilities growth. We are studying the relationship between design investments and performances' improving, for this reason, design policies represent the first form of these investments for beneficiaries.

During the lifecycle of the policy and after it, we stress the presence and the relevance of a cumulative variable that takes into account the impact of external factors on the process itself. This makes the curve-trend different in different firms and for different contexts. We

suppose the one above as the typical curve of design capabilities' trend in a firm involved in an innovation design project. The differential design capability level (ΔDC) is also impacted by the following factors:

1. Before T_0 we refer to the initial situation in which the beneficiary firm is located. The company may have an initial $DC_0>=0$ according to its knowledge and spread of the design capabilities within the company.

   Through the observation of the beneficiaries, we have verified empirically that the smaller is this, the greater the growth (slope of the curve) of the design capabilities as a result of the participation in a design policy. At the beginning of this research it was one of the hypotheses that through the study we set out to verify.

   Analysing the results obtained by companies, we found that those companies who had never had anything to do with design and designer had found greater resonance of the effects. These companies stated that they had obtained changes and improvements in NPD substantial, far from it the others firms that were more familiar with. Just like that we report a significant passage from Giovanni Rivolta, founder of A4Adesign beneficiary firm in the design industry, in which emerges that correlation:

   "(...) we are a design-centred firm; design is basic in our daily work. We work not only with design but I would say in the design world. We are all designer in the company, we understand deeply the importance of design as a competitive advantage. So we usually develop our project in a similar way compared how the policy works, we can say that we were used to this practices, we were used to this particular concept development process".

   That was appeared about the absorption of capabilities and the change in the NPD in which firm that already work with design and designer.

2. Between T_0-T_1 we illustrate how the growth in term of design capabilities is impacted by different factors. As a consequence the scope of the line is a sum of contributes given by:
   1. The investment (in term of money);
   2. The mechanism (the innovation process practices) provided by the policy;
   3. The internal effort of the firm.

With the goal of clarify how these many factors are related to, we refer to a micro-framework in which is represented the enterprise in the design environment:

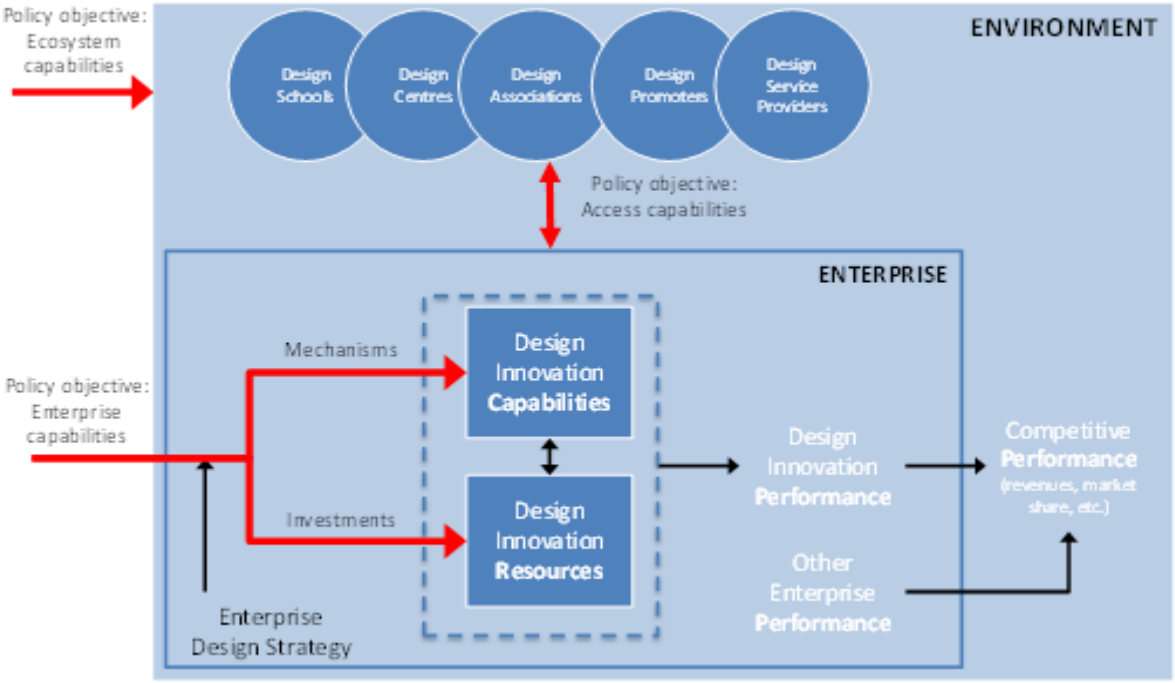

Figure 19 Micro-Framework (opening up the black box)

The micro-framework represented in figure 19 aims at opening up the firm black box showing the impact of the design investment on the resources and capabilities of enterprises, it is a preliminary framework developed to guide the empirical analyses (case studies). To compete in the market, firms should complement their own investments in design **(named as Enterprise Design Strategy)** with resources from policies aimed at enhancing Enterprise capabilities (**as Policy objective: Enterprise capabilities**). This Enterprise Design Strategy and these policies contribute both to the stock of **Design Innovation Resources** (e.g., number of designers) and thanks to the specific **mechanisms** through which they are deployed (e.g., vouchers, loans, interactions with experts, etc.) they guarantee the enhancement of **Design Innovation Capabilities.** Design innovation capabilities are embedded in the design (especially human) resources and they can grow over time thanks to learning-by-doing processes (e.g. thanks to the involvement in creative design processes and collaborations with external subjects).

Besides policies aimed at improving enterprise capabilities, firms can also leverage policies aimed at improving access capabilities**,** e.g. policies supporting the development of the capability to access external knowledge and collaborate with other subjects.

One hypothesis we made is that firms adapt their Enterprise Design Strategies to their existing level of resources and capabilities and to the available policies (e.g. the firm doesn't invest own resources in mobility programs for its researchers if there are policies already promoting mobility programs).

As is shown in the figure using Design Innovation Resources and Capabilities, firms obtain specific **Design Innovation Performances** (e.g. time to market of new products, new design registered-IPR). Overall **Competitive Performances** are then the result of such performances and of **other performances** of the firm such as supply chain performances, sales and marketing performances and financial performances.

3. Between T_1-T_2 we identify two contributes that explain why the scope is negative:
   1. The monetary effort provided by the company itself (prototype development);
   2. The Absorption.

   Absorption is the main step of the absorption process for each firm, actually as Acklin named it, the **transformation phase**. The harder critical is being able to transform the skills that during the policy have been assimilated by the company (till T_1) and to absorb as many as possible. In fact, a part of these will not remain inside just because of the end of the support, as evidenced by the scope that is negative because firms will not have its contribute anymore. We could expect this curve because some of the benefits that the firm used during the policy are now out of the firm's process. The loss of benefits in terms of capabilities will be greater, lower the effectiveness of the policy will be.

4. After T_2 we consider the firm in a new stable condition. If the firm has managed to absorb and retain practices and knowledge thanks to the investments, its final level of design capabilities will result higher than it was in T_0. To allow the successful of the

absorption process the company should leverage on the exploitation phase, otherwise it will have a further loss of the benefits obtained previously.

The interviews we made were carried out after the instant T_2 when the benefits of the policy had been "absorbed" by the companies and design capabilities had gone to the regime. The aim of the support given consisted in increasing the design capabilities of companies thus obtaining at the end of the policy a positive and sustainable over time ΔDC.

4.4.2 Consideration

We can conclude that SMEs with little or no design experience to gain competitive advantage through design has to go though a process of acquisition, assimilation, transformation and exploitation of new design skills. This capabilities' building process needs to be done partly by the company itself through building up design management capabilities that fit its context and specific necessities, and part together with external designers' partners. The expectations are to leave into those companies a strategic-oriented design view, new procedures and technologies, or even the awareness that in today's global competition one lever to be used for the success of companies is design.

A first consideration of our analysis came out of the chart in figure 19, where we have assumed a scenario in which a company participates in n-policies, and represented the cumulative curves with an 's' shape. The theoretical model presented in the figure below shows, in a graphic way, what is emerged by the study and the research we conducted through beneficiaries' interviews and policy makers' interviews. The first aspect concerns the assumption we made on how the initial DC_0 is considered with the DC_f of the antecedent support received, and as we have assumed above, that the final increase in capabilities (ΔDC) is reduced by increasing the number of policies to which it participates, tending to a value of 'design knowledge' asymptotic.
This result may guides policy makers in designing the future policies considering applications from those companies that have not participated in past policies with the same goals and the ones that are not design oriented.

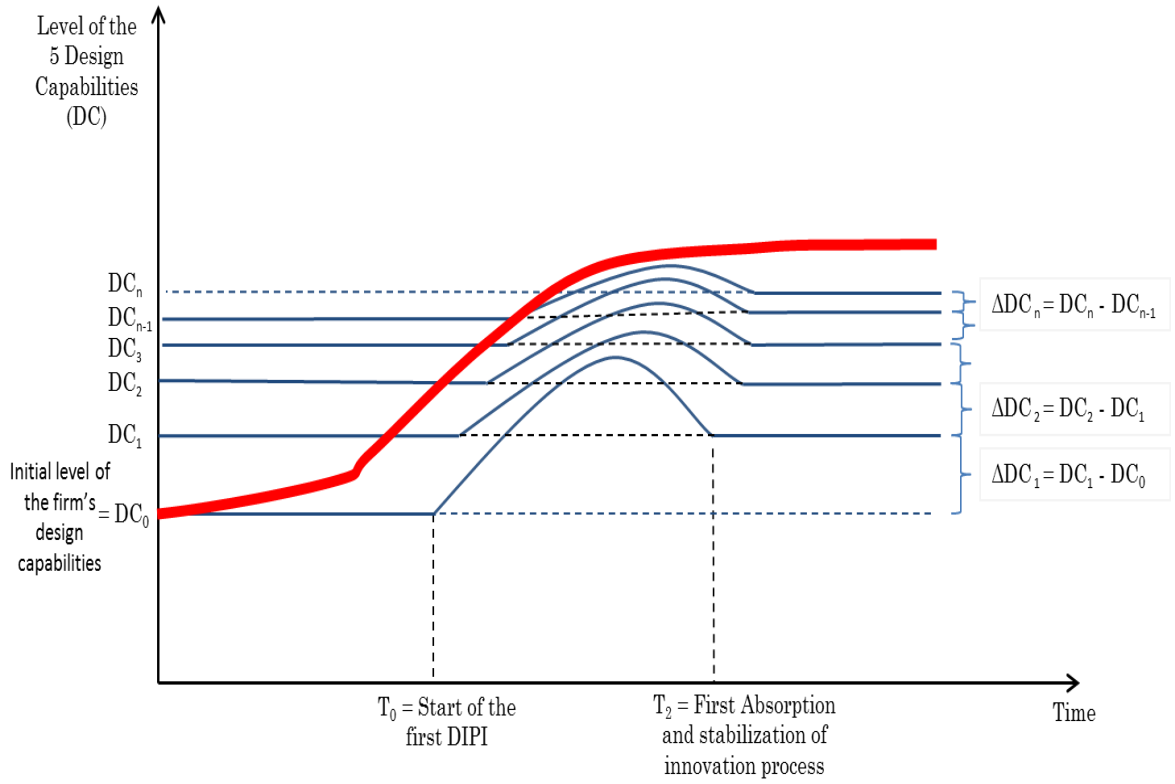

Figure 20 The cumulative effect of the DC

Another consideration as we have explained mentioning the different DC_0 level before T_0, concern the different effectiveness of a policy or investments in design according to the entry level of a firm in the process itself. We mean that the impact on design capabilities growth on firms' performances depend by the "design maturity" of the company itself; if a company have an higher starting level the final ΔDC will present a lower percentage increase than a company that have no perception of design. This result allows us to show in the graphics in the chart, a hypothetical trend of the correlation between investments in design and firms' performances, which is not linear but decrease with the increase of design understanding and design maturity level.

What emerged by the research in general is that companies, particularly those that we describe with a low "design maturity" in term of design understanding, had a very positive perception of how design investments impacted on their business. This shows how spreading the knowledge of design creates a positive return on the industrial environment, pushing those companies that were at a low maturity to understand its strategic importance and to be ready to invest on it in order to gain competitiveness.

As an output of the case studies, we made a distinction between the beneficiaries firms. On one side we interviewed firms that has not previously collaboration with designers and had not hesitated to send their intention to apply in. On the other side, the remaining firms that work every day with designers, could not expect that they would have received a significant support from a collaboration with others designers and so they were sceptical about apply in. That is what happened in A4Adesign a Milan company run by two architects as we have already mentioned, where one of the two founders Giovanni Rivolta stated: *"We decided to try and apply for the project but our expectations were quite low. We thought that no useful ideas or innovative products could come out from other designers, so we looked to the policy with a little bit of scepticism. This is because we are a design firm that's why the last thing we could think about was search for a help in a design project".*

Another answer from coming out from the MomoDesign's interview, confirmed with different words what Rivolta thought: *"These initiatives are most useful for companies that have never collaborated with designers, for us it was not a novelty"* [Manuel Tavano - MomoDesign].

We could make a final consideration on the achievement of the results of these investments, consideration that we could make on the final ΔDC as a result of the five design capabilities: *Holistic View*, *How People Give Meaning to Things*, *Applying New Technologies, Visualizing and Materializing* and *Managing the Design Process*.

Our analysis can be seen as a theoretical strengthening of the policy assessment that we suggest though it was not our field of research. If the policy maker knew ex-ante not only the objectives of the policy, but some of the possible results in terms of increase of specific capabilities, it would be possible to purify the overall effect of the policy compared to those factors and to assess the policy in terms of "extra-return", e.g. net of the effects that it was estimated to reach. This assessment would be interesting to find correlations between particular policy implementation and outcomes achieved and between increased design capabilities and performance of companies.

The design profile framework

Others observations and conclusive hypotheses we can add in light of what is described through the model. Starting from the ΔDC obtained at the end of the investment process and by the variation observed in the design capabilities, we aim to introduce an interesting and original evaluation framework in order to build and define several typical profiles of companies and policies' beneficiaries.

We can think in order to introduce theoretically this interpretative and profiling model, to aggregate the values of capabilities that every enterprise reaches, obtaining a Policy Evaluation Index and compare it with a unique threshold value fixed by the policy maker. In that way is possible to evaluate different policies with a homogeneous measure.

Our hypothesis is inspired by the patterns of behaviour of Choy and by the studies on the evaluation of capability made by Choy. Using the three macro-areas in which design competencies are defined as the five design capabilities, we want to build a system that allows policy maker to analyse, both visually and analytically, the differences and the typical profiles of the companies that participate to the political support or that companies whose approach to design is mapped. The framework is based on two parts: a graphical part and an analytical part.

The Graphic part: Design LMEx

Design LMEx (Design Leadership, Management, and Execution) consists of a radar chart composed by three main areas: *Design Leadership, Design Management, Design Execution* (to which where appropriate we may stack the sub-axes forming each axis and which represent the five *design capabilities*) which lists the measured levels of each capability. The three values on each axis represent the level of the company in that specific macro-capability and are joined together to form a plane figure that represents the profile of the company, according to the reading of his capabilities.

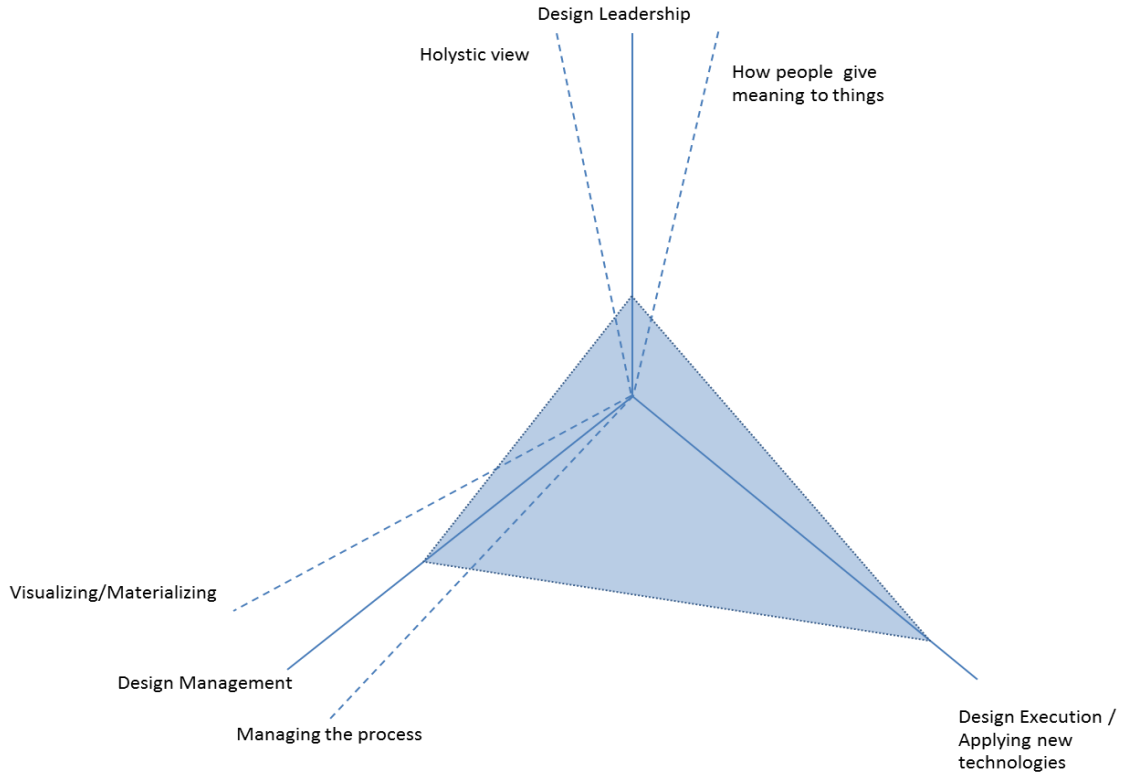

Figure 21 The Design LMEx graphic

Analytical part: The Policy Evaluation Index

The Policy Evaluation Index consists of a synthetic indicator on the evaluation of the as-is state of the capabilities of an enterprise. The index's value calculation is done through a complex algorithm that takes into account for each firm the Area and the Perimeter drawn on the Design LMEx and the sheer weight of the three main design capabilities Leadership, Management and Execution corrected with appropriate correction coefficients. The theoretical proposition of the algorithm follows the approach of the analysis and assessment of skills and it is an original reworking that we propose as part of our research. The algorithm and the analytical part of the Policy Index are constructed as follows:

$$\text{Policy Index} = A + (\delta * P) + (\alpha * DL) + (\beta * DM) + (\gamma * DEx)$$

A= Area

P= Perimeter

DL= Design Leadership

DM= Design Management
DEx= Design Execution
δ, α, β, γ= correction coefficients

The reference to the theoretical model we wanted to present here remains a synthetic inspiration. Our thesis and the DeEP project did not continue on the main analysis of the companies' profile that is rather fundamental basis for the study and analysis of the framework. However, we wanted to include in the discussion the concept of this model for the originality that sets it apart and usability that characterizes it, convinced that we will return in the future to improve and expand it and to make it a complete framework, usable and useful.

5. DeEP evaluation tool

Once established the existing relationship between design investment and firms' performance improvement, we are able to present how to operationalize it. The purpose of this closing chapter is to provide the necessary tools to measure the final ΔDC obtained by firms thanks to the design investment. After having presented the absorption model, we propose in the following an evaluation system of firms' performance improvements and include them into the **DeEP evaluation tool** made up by two set of indicators: the macro and the micro panel.

The DeEP tool represents the closing part of the DeEP project leaded by Politecnico di Milano. The tool is a support that could be used by policy makers and beneficiaries and it is designed to be an interactive data gatherer and an evaluator of the support provided by the policy.

In the DeEP tool are taken into account the three policy evaluation phases: ex-ante, monitoring and ex-post. As many studies reported, these phases include all the output reached by the firms during the investment period and transform them into knowledge sustainable in the long term. The transformation takes place right through the absorption process described in the previous chapter through the four stages of *Acquire, Assimilate, Transform* and *Exploit* of the mentioned skills. For this reason, despite our focus was put on firms' evaluation and not on policies, we felt it appropriate to make an assessment at the aggregate level for enterprises through the measurement of the results achieved by the policy in the three phases. We were able to give strength to our hypothesis assuming that a significant effectiveness of the policy match outstanding results for the participating companies. We see design innovation policy as a form of investments for firms; and so on we are measuring the effectiveness of those investments at an aggregate level.

The **DeEP evaluation tool** was structured starting from the *policy cycle* proposed by Harold Dwight Lasswell and later refined by others (DeEP Glossary 2013). This model will help us to introduce our evaluation system at micro (firms) level based on a construction of three set of indicators.

The policy cycle is a conceptual model describing the stages involved in making policy and its cyclical iterative nature. There are many variations in the number and types of activities within the cycle; we managed the following stages:

1 – Agenda Setting

2 – Policy Formation (Policy Formulation)

3 – Policy Adoption

4 – Policy Implementation

5 – Policy Evaluation

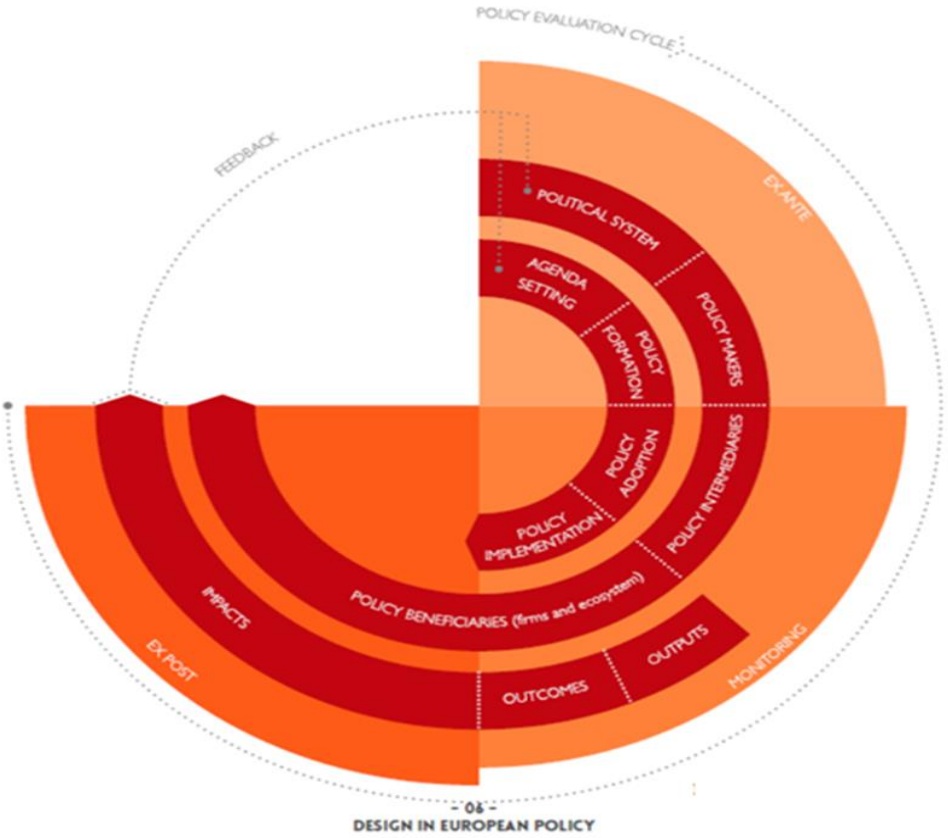

Figure 22 The Policy Cycle adopted by DeEP (Source: DeEP Glossary 2013)

Agenda Setting

According to the policy cycle, the first stage in policymaking refers to the identification of a "public problem" or challenge, which requires the state to intervene. Those public problems that are chosen by the decision makers constitute the policy agenda. In this context Cobb and Elder (1972) make a distinction between the systemic agenda and the institutional agenda. The systemic agenda refers to all societal problems that demand public attention, hence forming the 'discussion agenda'. The institutional agenda, by contrast, contains a set of problems that are up for the serious consideration of decision

makers. Thus, the institutional agenda is the 'action agenda', which is more specific and concrete than the systemic agenda. (Knill and Tosun, 2008).

Policy Formation

This second stage involves the discussion of different feasible courses of action for coping with policy problems and the acceptation or rejection of them. Policy formulation deals with the elaboration of alternatives of action and generally is strongly related to the subsequent stage (policy adoption) therefore a clear-cut distinction between them it not always feasible.

Policy Adoption

Policy adoption refers to the formal adoption to take on a policy and in contrast to preliminary stages of decision-making; government institutions determine it. For this reason, several factors impact on the adoption of a policy option. We will not discuss them in this chapter but we highlight the complexity of this phase.

Policy Implementation

Within the policy cycle, the implementation phase represents the conversion of the previous decisions into practice. Implementation may appear as an automatic continuation of the policy-making process; nevertheless, there often exists a substantial gap between decision-making and implementation. Consequently to open the 'black box' between policy formation and policy outcomes various theoretical approaches were elaborated. We report the one proposed by Pülzl and Treib (2006) which divide implementation into three models:

1) Top-down models (Pressman J. and Wildavsky A. 1973; Bardach 1977; Mazmanian and Sabatier 1983) primarily emphasize the ability of policy makers to produce unequivocal policy objectives and control the implementation process;
2) Bottom-up models (Lipsky 1971, 1980) regard local bureaucrats as the central actors in policy delivery and view implementation as negotiation processes within networks;
3) Hybrid models (Mayntz 1977; Windhoff-Héritier 1980) integrate elements of both previously mentioned models and other theoretical models.

Policy evaluation

A good evaluation system have to investigate if the output of the decision making process has attained the intended goals. Policy evaluation provides a feedback loop, which enables decision makers to intervene and eventually modified the policy course of work when possible. We can define the aim as the fulfilment of objectives, development efficiency, effectiveness, impact and sustainability. Evaluation refers to the process of determining the worth or significance of an activity, policy or program. An assessment, as systematic and objective as possible, of a planned, on-going, or completed development intervention (OECD, 2002).

Afterwards the main aims of the evaluation are to:

- Evaluate the effectiveness of the design innovation policy in connection with the objectives defined in the agenda setting;
- Support policy makers to develop policies that are more effective by integrating better evaluation in the policy cycle.

As explained above, the **DeEp evaluation tool** is made up by the three phases considered for the assessment: ex-ante, monitoring and ex-post phase. Our focus will be given on the last two phases.

Ex-ante evaluation precedes decision-making and give insight on the effects and implication of the assessed policies in order to provide feedbacks into the on-going decision-making process. If undertaken on alternative courses of policies and actions, ex-ante evaluation is useful to selecting alternatives.

At the end of this stage of the evaluation process, a checklist of key question can be provided (Rutman (1980), Smith T. (1989), and Wholey J.S. et al (1994)):

- Are the policy goals and objectives well defined?
- Are the policy goals and objectives feasible?
- Is the process to achieve the desired results, presumed in the policy theory, feasible?
- Are the constituent components, activities, and functions of the policy well defined and sufficient?
- Are the resources allocated to the policy and all its various activities adequate?

After having concisely described some aspects of the ex-ante evaluation, we come out with the **Monitoring evaluation**, a process to control and evaluate the on-going efficiency of the policy management. The on-going evaluation identifies the intermediary effects and results of the policy and give real timing information on how it is being developed while that is still under way. The essential function is to 'feed relevant information back into the implementation process when this can be used to adjust or redirect the process' (DeEP Glossary 2013).

It could be realized by the Earned Value Management (EVM) system borrowed from project management techniques. EVM is a technique for measuring project performance and progress in an objective manner (Marshall R., 2007). The typical EVM can be adapted to policy evaluation and could be structured as a process in four steps:

1. **Define the policy and its stages:** define the activities that are needed in order to implement the policy and insert milestones that would work like check-up points where the process could be evaluated and monitored;
2. **Assign value to each activity:** policy maker starting from the initial budget, should assign resources to each one of the previously identified activities;
3. **Define the "earning rules":** policy maker defines how to measure the completion of an activity. Policy makers must decide which rules to adopt in order to weight the completion of an activity and consequently the proportional budget allocated for it.

   The three steps above must be defined during the policy design before its implementation.

4. **Measure progresses:** during the policy life-cycle and at its end, earned value (EV) is accumulated according to the earning rules. This is usually done at regular intervals or according to the milestones inserted into the policy timeline. The primary benefit of using EVM is the creation of a technical performance scoreboard for the project. EVM requires cost performance to be monitored and reviewed at regular intervals. To measure cost performance, the planned value of activities (or BCWS - Budgeted Cost of Work Scheduled) and its earned value (or BCWP - Budgeted Cost of Work Performed) must be expressed in units of currency; the

same units must measure the actual costs sustained (or ACWP – Actual Costs of Work Performed). The planned value curve is commonly called a Performance Measurement Baseline (PMB) and may be arranged in control accounts, summary-level planning, planning and work packages. Starting from this data the evaluator can estimate, from the comparison between BCWS and BCWP, if the implementation is delayed or from the comparison between ACWP and BCWP, if the policy implementation is over budget, all along the life cycle of the policy.

Ex-Post evaluation instead assesses the impact of the policy intervention and provides a feedback on the degree of accomplishment of the policy objectives. Many policy maker could only be interested in this final part of the evaluation process; so as an investment, this kind of support provided to firms should be evaluated in term of objectives achieved and reasonably, the future initiatives' developments will depend upon the lessons learned from the past measured performances.
At this stage it is possible to verify the increases in performance and design capabilities of the target companies once the support ended. Compared to the absorption model we are positioned after the $T_{interview}$ when the policy is terminated and the exploitation process completed.

After having presented the different phases of the evaluation process, to make usable our **DeEP evaluation tool** we have to deal with an operational aspect, namely how can be translated the measurement of the impact of design in firms' performances. It means that we have to know what kind of indicators we should use assessing firms' improvement in the different phases. Starting from this perspective, we chose to conduct our analysis mainly on the monitoring and ex-post evaluation.
Measuring performances' gap is the way to inference how design and design investments impacted on firms' results. Measuring performances' gap means to use key performance indicators, which will give a quantitative and qualitative feedback on firms' performance improving.
In our study we have evaluated the design innovation impacts, by aggregating the data collected during the beneficiaries interviews reported in the case studies (see annex). The metrics of the assessment were applied in two different moments:

1) T_0: representing the first moment of data collection (e.g. at the beginning of the design policy);
2) T_1: representing the second moment of data collection (e.g. at the end of the policy).

These metrics enables us to measure the starting condition of the beneficiaries firms in terms of design capabilities and the modified situation at the end, thus calculating the variation in the stock due to the design innovation policy.

The used **tool** is formed by two sets of indicators:

1) Macro indicators, aimed at evaluating design policy initiatives at Ecosystem level;
2) Micro indicators, aimed at evaluating design initiatives at SMEs level, presented in the *Micro Indicators Manual*.

5.1 Macro-indicators

Talking about macro indicators we refer to the Lancaster University analysis within the DeEP study, we acknowledge that macro to micro indicators are a continuum rather than "hard" categories. Macro-economic indicators are likely to be concentrated in the early and later stages of the policy cycle; they become part of an evaluation framework through:

1) Baseline data which provides part of the agenda setting process (ex-ante);
2) Measures of the impacts at some distance down the 'process' (ex-post).

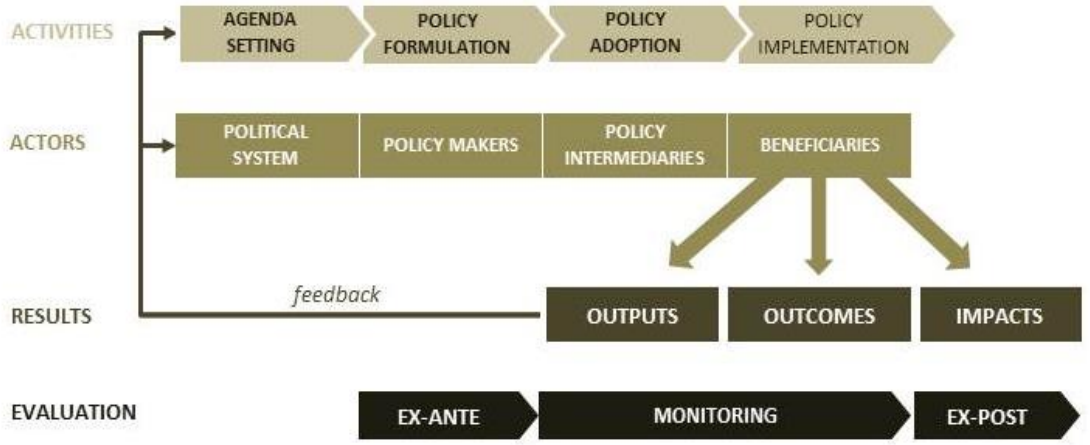

Figure 23 Policy evaluation framework

Although they are powerful measures, they often are highly aggregated and these indicators give little indication of the causal 'path' of impact for a specific policy. For this reason these metrics are likely to be filled with micro-indicators within the evaluation framework.

Macro-indicators can provide additional insight and analysis in addition to that already said:

1) The first one is in the power of comparative macro-economic data to design specific data, comparing design services macro-economic data to more aggregated national economic data. Both comply provide useful data on changes to the design industry in relation to an overall national economy;
2) The second one is that when looking at policy results at macro-indicator level, we need to be acutely aware the problems of aggregated data when looking at the impact of a policy on organisations. As we would expect with broader innovation funding, the impact of a policy is highly skewed in terms of impacts on individual businesses. For example, it might be that only 5% of firms subject to the policy see gains, which would suggest an average of 'no impact', but that the gains made by those 5% are themselves, in real terms, enough to make the policy a cost-benefit success;
3) The third one is to match macro-economic indicators to micro-indicators in terms of firm activities in a framework for specifically looking at certain capabilities growth.

5.2 Micro Indicators Manual

The construction of the micro-indicators was conducted with the development of *micro indicators manual* we present here made of two parts: the following chapter and an attached table of indicators (MsExecel file).
The micro-indicators analysis gave the main contribute to our research. It has the aim to help policy makers selecting the best panel of indicators to quantify the impact of design investments on firms. We want to describe it here in order to complete the research on design investments in relation to company's performances and how to measure, consider and interpret them. As previously mentioned the focus has been put on design capabilities growth using monitoring and ex-post evaluations.
In the next chapter we present the prerequisites for the development of an evaluation system at micro level (firm level) that has been developed to facilitate the identification of a proper panel of indicators.

5.2.1 Prerequisites and instructions

To build specific evaluation systems for their policies, Policy Makers have to decide how, when and what to measure and in particular they have to select specific subsets of indicators (scoreboards). The selection of indicators from different typologies can be made for instance considering the type of beneficiaries involved or by the aim of the policy (e.g. a policy focused on a specific design capability will adopt more indicators from that category of indicators).
The research leads to three different types of panel indicators that a policy maker could use:

1. **Core indicators,** a panel of synthetic indicators and less costly to collect, a set useful to analyse all design policies and available to any user of the tool as a central feature in order to have the most significant data and the most standard and comparable;
2. **Custom indicators,** a panel of indicators that are customized in order to be simple for low maturity policy makers but also not too much costly to collect, it is a custom set of indicators for the specific policy under evaluation. The set is

identified within a wider list by an expert consultant with the help of the policy maker;

3. **Personalized indicators,** a set of comprehensive and deep indicators more expensive to collect, it is an additional set specifically created by DeEP consultants when necessary and required.

The choice of a specific evaluation system can be made selecting indicators of different typologies. Indicators can be present in more than one typology and thus they can be used for more than one evaluation objective. Examples of indicators have been provided in the attached MsExcel file highlighting the related data and typologies. Indicators and data identified can also be used as inspiration and support to develop different indicators than the ones provided.

Indicators can be compared to three different baselines accordingly to three different evaluation objectives:

1) **Time scope:** indicators can be compared considering different moments in time in order to analyse current state, changes and improvements in firms skills or capabilities;
2) **Geographic scope:** The indicators can be compared to benchmark values or means, in order to make comparisons with different economic systems, nations and group or firms, industries or sectors;
3) **Pre-defined scope:** The indicators can be compared to pre-defined thresholds, in order to verify the achievement of pre-defined results.

5.2.2 Description of the table of indicators

In the MsExcel file containing the example of indicators, the main typologies of indicators are clustered in two central topics: **indicators of desig**n and **indicators of innovation**. Both clusters are divided into *Input, Capabilities* and *Output*.

Indicators of design

As we have already shown in the absorption model, at the end of the policy or, more generally, of the design investment period, the company should withhold part of the know-

how generated inside. To quantify the increase in the five design capabilities of the enterprises, we have built several indicators with the aim of measuring the magnitudes of the design investment before and after the policy. Each indicator is reported to one of the design capabilities. In particular, the indicators are grouped in the following categories:

1. **Design input:**

   This classification aim to investigate and group all resources used by firms in order to support and stimulate the development of design capabilities (e.g. N. of people that work with design).

2. **Design capabilities:**

   The set of design capabilities indicators are classified in different typologies as described in chapter 2 and chapter 3, for each capability, we can provide here an example of indicator:

   1. *Holistic view,* e.g. 'The strategic importance of the design innovation content of the policy was high';
   2. *How people give meanings to things,* e.g. 'Customers satisfaction of new design products';
   3. *Applying new technologies,* e.g. 'N. of new design methods, tools, etc. introduced during policy';
   4. *Visualizing and Materializing,* e.g. 'N. of design prototypes developed or intended to be during the policy';
   5. *Managing the Design Process,* e.g. 'Effective mechanisms for managing process change and creativity from idea through to successful implementation'.

   These types of indicators aim to map and analyse the improvement achieved by enterprises in those capabilities and skills that determine the innovative and competitive level of a firm. They are useful to investigate the difference between capabilities level before the policy participation and after that ($\Delta DC>0$).

3. **Design output:**

   This type of indicators measure the tangible results related to design, but not ascribable to a growth of capabilities and skills. They map the improvement in enterprises' results or outputs that derive directly from the policy due to the policy participation (e.g. N. of design patents registered or intended to be).

Indicators of innovation

We included this category of indicators because we can consider design according to our hypothesis number one, as a form of innovation and design policies can be recognised as form of innovation policies. For this reason innovation indicators can be useful to complement the analysis, especially when the distinction between design and innovation is more difficult. Innovation indicators can be grouped in the following categories:

1. **Innovation Input:**

   These are the indicators that help setting focus on enabling predecessors of the production of innovation. Indicators could therefore be both monetary and non-monetary in terms of monetary measureable assets (e.g. budget spent) or in relative terms (e.g. capabilities or routines to generate input, ideas and concepts). Further can the innovation input indicators have an internal or an external focus, measuring e.g. the firm's ability to attain input of new ideas from internal functions or its ability to extract input from extreme users or evolving markets.

2. **Innovation Capabilities:**

   1. *Strategy*: this first capability gives a holistic perspective to the analysis and are important in terms of putting focus on how firms are strategically handling innovation to support overall business purpose. The balancing and handling of seemingly contradictive dualities (e.g. long-term and short-term, or radical and incremental) is a vital part of that. To help the evaluation process, indicators are used to match innovation and overall strategy and to analyse how innovation is managed and planned for in terms of maintained innovativeness in both long and short-term perspective.

2. *Knowledge Management*: innovation is in one way or another always affected of how knowledge is managed and these indicators help analyse both the knowledge and the processes for knowledge. Indicators that address how firms build, spread and access knowledge within and outside the organization and investigate the match between knowledge and future needs to remain innovativeness over time.
3. *Organization and Culture*: firm's organization and culture have a great impact on its innovative capability. These indicators provide information about e.g. incentives and support for innovative behaviour, communication and attitude towards failures.
4. *Project Management*: here we find the indicators that help firms analysing the content and the deployment of the innovation process e.g. tools and methods used in the process, multidisciplinary represented by the participants in innovation projects, methods for selection and termination of projects.

3. **Innovation Output:**
   The output indicators helps to analyse both the direct output of a firm innovative work in terms of e.g. impact on revenue and patents, but also the firm's capability to capture the more indirect values like e.g. capability to absorb and incorporate new experiences also from non-successful innovation projects.

We decided to make a distinction between design and innovation indicators considering that the impacts measured by each indicator are not completely overlapped. For this assumption we divided them into two mutually exclusive classes. In the excel file for each indicator is signed only the most relevant impact and it is measured on design capability or innovation capability not for both of them.

After the two main distinction we would like to add other important indicator typologies with the aim to provide a stronger analysis of the results achieved. We chose some of them selecting from the indicators literature and some other we added to complete the set. We report below the picked typologies:

i. Indicators of policy maker's **maturity level** (level 1; level 2): this type of indicators relates to the policy makers' experience in designing and managing the evaluation process. Level 1 means a more experienced policy maker than level 2;
ii. Indicators of **beneficiaries' maturity level** (level 1; level 2): this type of indicators relates to the beneficiaries' experience and competence in design, it aims to investigate the capability to understand design capabilities and how to increase them. Level 1 means a more mature beneficiary than level 2;
iii. Indicators of **beneficiaries size**: this type of indicators define the size of firms that beneficiate from the policy support. We divided dimension into two categories: firms with less than 50 employees and firms with more than 50 employees;
iv. Indicators of **access to design**: this type of indicators investigates the capability to interact with external subjects or stakeholders. Indicators that have an impact on this specific column aim to map communication through the supply chain and between the firm and the economic system around it;
v. Indicators of the evaluation phase (**Monitoring** and **Ex-Post**);
vi. Indicators of time focus: **short term** (0-12 months after the policy) and **long term;**
vii. **Qualitative/Quantitative** (see literature indicators theory);
viii. **Financial/Non-financial** (see literature indicators theory);
ix. **Relative/Absolute** (see literature indicators theory);
x. **Efficiency**/**Effectiveness** (see literature indicators theory).

We want now to describe and present the different set of indicators that we identified in order to provide a useful and complete measurement system for policy makers and firms. Starting from the *core panel* that allows having a synthetic, solid and comparable overview on a support policy, we arrive to the *customized* and the *personalized panels* that are the incremental step of the evaluation process. The customized and the personalized panel provide a deeper insight on policy results and allows those policy makers that requires it, to have a better overview and a more specific one on the policy they implemented.

5.2.3 Core Indicators Panel

The following set of indicators is the first of three panels came out from our research. The panel is named *core indicators panel*, it is the result of a selection process, made on indicators, that aim to provide policy makers an accessible, usable and relevant subset of indicators. Measures coming from this list of indicators should provide a general overview on how firms approach to design practices and how design policy boosted their competitive advantage. Coherently with our classification, we divided them into design capabilities and output, both of which provided in a quantitative and a qualitative measure.

	QUANTITATIVE INDICATORS	**QUALITATIVE INDICATORS**
Design Leadership (Holistic View; How People Give Meanings To Things)	N. of new products launched during last year that integrate functional, emotional and social utilities / total number of new products launched during last year N. of new products launched during last year based on the involvement of clients in co-creative practices / Total number of new products launched during last year	There are clear connections between the design activities and the overall strategy Number of products launched during last year that exceeded sales expectations / Total number of new products launched during last year
Design Management (Managing The Design Process And Creativity)	Investments in training programs on design / total revenues Number of employees involved in design activities (e.g. designers) / Total number of	Design activities are managed through explicit processes Number of new products launched during last year based on the involvement of external design professionals / Total number of new

	employees	products launched during last year
Design Execution (Applying New Technologies; Visualizing and Materializing)	N. of new products launched during last year improving the customer experience and the user interface through new technologies / Total number of new products launched during last year N. of prototypes developed during the last year / Total number of new products launched during last year Investments in hardware and software technologies enabling design activities / total revenues	Visualization (e.g. storyboard) and/or materialization (e.g. prototypes) techniques play a crucial role in concept development
Output	Revenues from new products launched during the last year enabling new user experience / Total revenues N. of design/innovation awards received during the last year / Total number of new products launched during last year N. of designs and patents associated to design projects developed during the last year	The design activities allowed to develop new products that would not have been developed otherwise

Table 24 Core panel indicators

In order to understand better each indicator and what it addresses, we want to describe them and stress the focus on firms they have. Each indicator aim to map and investigate the quantitative and qualitative changes that a company experienced in its processes and performances after the support offered by investments (provided through the policy).

a) INDICATORS OF DESIGN LEADERSHIP:

1) **Number of new products launched during last year that integrate functional, emotional and social utilities / total number of new products launched during last year:**

   This indicator measures the ratio between new products that have an innovative design approach in relation to new products launched in the last economic year. This indicators aim to explore how firms are able to perceive and integrate new customer perceptions or uses in their products.

2) **Number of new products launched during last year based on the involvement of clients in co-creative practices / Total number of new products launched during last year:**

   This indicator measures the number of firm's programs or initiatives where clients or customers are involved as an active part of the development process. This indicator aim to investigate the capability of the firm to explore customer behaviours and to exploit them.

3) **There are clear connections between the design activities and the overall strategy:**

   This key question deal with the linkage between design activities and the overall strategy of the firm. This indicator aim to investigate the coherence between the overall firm strategy and specific objectives related to design activities. It measures the alignment and consistency between specific objectives associated to innovation design projects and strategic objectives defined at the corporate level.

4) **Number of products launched during last year that exceeded sales expectations / Total number of new products launched during last year:**

   This key question deal with the capability of the firm to meet customers' expectations and to exceed them. This indicator aim to investigate the firm's comprehension of customers' needs and wants.

b) INDICATORS OF DESIGN MANAGEMENT:

1) **Investments in training programs on design / total revenues:**

   This indicator measures the economic effort made by the firm in relations to design training programs and the usage of design concepts into organizational processes. This indicator aim to investigate the importance design has within the firm.

2) **Number of employees involved in design activities (e.g. designers) / Total number of employees**:

   This indicator measures the percentage of employees that works with design or that are involved in design activity compared to the total amount of employee. This indicator aim to map how spread is the comprehension about design as a form of competitive advantage and as a bundle of procedures and activities that can be used in different firm's units.

3) **Design activities are managed through explicit processes:**

   This key question deal with the formalization of the design process and the management of design activities in the firm.

4) **Number of new products launched during last year based on the involvement of external design professionals / Total number of new products launched during last year:**

   This key question deal with the capability of the firm to involve external skilled resources and integrate them in firm's processes. It measures the ability of the firm in communicating with external designers.

c) INDICATORS OF DESIGN EXECUTION:

1) **Number of new products launched during last year improving the customer experience and the user interface through new technologies / Total number of new products launched during last year:**

   This indicator measures the ratio between new products launched that enables new using experience and that uses new technologies compared to new products launched during the last economic year. This indicator aim to investigate the capability of the firm to integrate into new products both new user experiences and new technologies.

2) **Number of prototypes developed during the last year / Total number of new products launched during last year**:

   This indicator measures the efficiency of the firm in the creative process, the capability to pass from projects to prototypes. This indicator aim to map the efficiency within the development process and aim to investigate the firm's capability to visualize and materialize concepts.

3) **Investments in hardware and software technologies enabling design activities / total revenues:**

   This indicator measures the investments in new technologies that enable design activities in the firm processes in relations to total revenue of the firm.

4) **Visualization (e.g. storyboard) and/or materialization (e.g. prototypes) techniques play a crucial role in concept development:**

   This key question deal with the capability of the firm to visualize and materialize (prototype) its concept and its design processes. This indicator aim to investigate the capability of the firm to go through the entire process of new product development and to be efficient in it.

d) OUTPUT:

1) **Revenues from new products launched during the last year enabling new user experience / Total revenues:**

   This indicator measures the revenues coming from new products launched in the last economic year that enables new users' experience. This indicator aim to investigate the capability of the firm to sustain business through new products that meet customers' needs and that enable new experiences.

2) **Number of design/innovation awards received during the last year / Total number of new products launched during last year:**

   This indicator measures the number of design awards received by the firm in the last year. This indicator aim to investigate the maturity of the firm in the perception of design and in its usage.

3) **Number of designs and patents associated to design projects developed during the last year:**

This indicator measures the outputs of the design process in terms of intellectual property rights and deal with the tangible outputs the firm reach at the end of the design process.

4) **The design activities allowed to develop new products that would not have been developed otherwise:**
   This key question deal with the policy and with new products or product ideas that have been developed thanks to design usage. This indicator aim to investigate the support provided by design activities and their relevance in new product development process.

5.2.4 Custom and Personalized Indicators

If policy makers will need a deeper evaluation and they will wish to make a more precise evaluation of the results obtained from firms, they could need a deeper analysis in addition to the *core panel*. Through a customization service of the indicators foreseen in the deep tool, they would have access to the other two panels: **custom** and **personalized indicators**. In our study we do not treat the personalized set as it requires an ad hoc service received by the opinion of an expert who should personally study the policy issue and provides a list of specific indicators. Otherwise, as regards the custom panel provided, policy makers will have to select specific subsets of indicators to build a custom evaluation system for their policies. The choice can be made using the MsExecel file selecting indicators of different typologies according to the measurement purpose and the maturity level of who are going to take part in the measurement process. Participants of the measurement process could be either (or both) the evaluator or the evaluated firm depending on who is actually handling the indicators.

It is possible to implement this customization through selection criteria. To do this we provided a “filtering system” that gives, depending on the different characteristics of the respondent, a customized set of indicator. This set of adjunctive indicators must be used with the core panel previously described and not substitute it, the information it could gather are more specific and more stick to the respondent but are information that need the standard level of evaluation in order to be consistent and comparable.

To facilitate the selection process we present a set of questions, from the answer to those questions depends the indicators selected.
The questions are grouped into three categories:

1. Context (e.g. budget and previous experience, size of beneficiary firms);
2. Aim and purpose of the policy (e.g. targeted to design, development of capabilities, etc.);
3. Aim and purpose of the evaluation (see how beneficiaries do compared to other business).

The filtering system, based on key question we described above could be easily applied in the MsExcel file provided. The selection is made through a system of real filters on the excel file that follows the different characteristics of the respondent in order to select those indicators that are useful for it and that are specifically targeted on its needs. Regarding the first classes of key questions for example, different indicators and consequently different custom panels will be provided to policy makers. In one case with a long experience in designing and implementing support policy targeted to big companies (more than 500 employee), in the other case with no or less experience on design support initiative and that want to implement a policy targeted on SMEs. Following the specific order of key questions and filters, an expert or consultant is able to provide a panel of indicators specifically targeted on needs and characteristic of a policy maker.

The selected custom or personalized panel could help a company, with the aid of an expert, to better evaluate its path and to better match its objective. We want to underline and stress that the process conducting to the panel has been designed not only for policy makers that wants to track and monitories the policies they implement, but also for firms in order to evaluate their improvements in performances and plan the remaining effort in order to reach tasks and goals.

6. Conclusions

Finally, in this last chapter of our paper, we want to recapitulate and highlight the results we argued and the outcomes that derive from our research. We started this research with a main issue, as we wanted to investigate the relationship between investments in design innovation and performances of firms that received or made this investment, in terms of resources, skills, knowledge or people.

We proposed two hypothesis that leaded our research: the first was that investing in design in a sense is related to investments in innovation; the second was that design investments have an impact on company's performance through a complex set of design features, skills and competencies called the five design capabilities (holistic view, how people give meaning to things, visualizing and materializing, managing the design process and applying new technologies).

Starting from the bibliographic analysis and going through a consistent number of past studies and research we were able to investigate the topic and the hypothesis we made thanks to the participation to the DeEP project. It was our task to analyse the Italian policy 'Un designer per le imprese' and carry out various interviews with policy makers and enterprises that beneficiate from the support policy. This was the first step of our original study on the two hypotheses we mentioned before because in the interviews we tried to figure out if the hypothesis we made were supported by data, questions we asked and policy general outputs.

After this first step we decided to do a cross-country analysis involving the others partner of the project in order to make our consideration and our research more consistent and to gather more data and results that could support our hypothesis. Here we aim to highlight the results we achieved in our study and what we argued after our investigation.

We can move from the first hypothesis onward: according to the results achieved through the interviews realized and the cross-country study we conducted, we can affirm that there is evidence of a relationship between design investments and innovation investments. As we evidenced before, the major part of the beneficiaries interviewed experienced, thanks to the design-based investment, a process of innovation not only regarding the final products but also evident in processes, activities and practices used by the enterprises itself. Design

support enabled innovation as a primary driver; many beneficiaries highlighted that result affirming that for them the support policy was actually an innovation policy.
The second hypothesis on the other hand was more complicated to investigate and less understandable by firms themselves. We aimed to study the existence, as was affirmed theoretically in some researches, of a relationship between design, seen as a bundle of complex activities and deeply linked to the company's strategy, and enterprises performances through the stimulation on five design capabilities. The extent of our research was to define and understand how design is divided in its three macro-capabilities; *Design Leadership, Design Management* and *Design Execution*, and how design could boost firm's performances empowering some areas and some characteristics of companies through five precise design capabilities as we said above.

Using the questionnaire we interviewed the beneficiaries trying to target in the questions we asked the five different capabilities in order to say if they could be defined and actually divided from each other. We can affirm that the existence of five design capabilities acting on specific skills and empowering a specific knowledge within the firm has been confirmed by the research we made and particularly by the analysis of the cross-country study. These five capabilities impact on company's performances addressing different competencies and characteristics of the enterprise. As those capabilities are stimulated by investments in design, they grow and can be absorbed by the firm. We identified in that particular stage the impact on firms' performances and the earning of competitive advantage through investments enabling the empowering of those capabilities and their retention called *absorption*.
In order to improve study that stage and this process we proposed a model "Model of Absorption" that aimed to study and design the rate of absorption of enterprises providing a comprehensive measure for the all design capabilities exemplified in DC. The research we made and the model proposed that was built on an original concept developed by Politecnico di Milano Department of management engineering, evidenced the relationship between stimulation of design capabilities through investments in design and absorption straight linked to companies' performances in the competitive market.
From the study we made we can say a relationship of causality between the five design capabilities did not emerge by the interviews, moreover we can add that those five are so

deeply linked between each other and for this reason it is difficult to depurate the impact they could have one-by-one on the firms performances.

As a conclusion we want to highlight the LMEx profile framework we proposed and just theoretically introduced in order to evaluate the increase in capabilities achieved by firms after the support policy and to define different typical enterprise's profile to improve target and design as support policy or an investment intervention to stimulate specific capabilities. We are sure that our research will be a starting point for further investigation on a topic and issue that will be the competitive edge in the future of global business.

7. Annex

Interview Case Report 1
Policy: Un designer per le imprese (Italy)
Organisation: Camera di Commercio Industria e Artigianato di Milano (CCIAA) (Policy maker)
Date: 4 December 2012
Place: Via Meravigli 9b, 20123 Milan, Italy

Interviewees:

Dott. Roberto Calugi-Enterprise development area Manager

In 1996 Roberto Calugi started working for Promos, a special agency for international affairs controlled by Camera di Commercio Industria, Artigianato e Artigianato (CCIAA).
In 2001 he became area manager for Middle-East, representing all the firms located into the Milan area. In this position he developed innovative financial instruments for the firms interested in working in the Arabian countries. He promoted international events both in Italy and abroad and enabled the collaboration between Italian enterprises and all the countries of the Mediterranean area. In 2008 he became "enterprise development" manager in the corporate holding (CCIAA) and he is also responsible for the patent office and for the CCIAA's branches in Rho and Legnano.

Avv. Valeria Tiengo – Innovation services officer

In 2010 Valeria Tiengo started working for CCIAA trough an annual internship into the sanctions office of the institute; her task was to provide specialized legal support to the office in litigation with the enterprises.
After the internship she continues the collaboration with CCIAA as a consultant, playing a role of continuous collaboration with high professionalism in support of the Observatory for the Administrative Simplification: this structure is responsible for monitoring the problems that businesses face in their everyday lives relate to the Public Administration and aims to promote the simplification of rules, regulations and administrative procedures.

The activities related to this task regard mainly the literature research in support of investigations conducted by the Observatory, a review of publications, presentation of investigations and coordination of all activities. From 1 July 2012, she starts working as a full time employee in CCIAA, at the Service Innovation - Area Development businesses. The activities of the entire area is devoted to the development of initiatives aimed at increasing the competitiveness of Milan, through tools that promote access to credit, innovation and the internationalization of companies.

Organization

Camera di Commercio Industria, Artigianato e Agricoltura di Milano is a public institution and therefore supports and promotes services of interest to the firms and enterprises located in the Milan area. Its head office is in Milan, but it has a series of satellite agencies in order to respond to local demand and provide local services to the businesses scattered throughout the entire area. "*More specifically, it promotes activities that focus on encouraging entrepreneurial training and tuition, facilitated credit business, innovation and transfer of technologies, the diffusion of e-commerce enterprises, the protection and safeguard of the environment in relation to manufacturing activities, infrastructure development and the exploitation of the resources within the area. It also focuses on targeted activities that aim to boost the economic development of the area and the level of competitiveness of the local business system at a domestic and international level. Further functions include the administration formalities foreseen by law (registration of companies, enterprises and professionals and other related procedures) and the promotion of fair and equitable codes of practice for all business contracts*". The CCIAA also exercises various functions assigned by *Lombardia* Regional Authorities, the Italian State Authorities and applicable International Conventions.

Introduction

- Time period to which the policies are related: 2010 – 2012 (and probably 2013)
- Size of budget allocated to implement the policies (in EUR): 475.000€ (CCIAA di Milano 220.000,00 €) divided as follows:

2010: 200.000€ (CCIAA di Milano 100.000,00 €)

2011: 120.000€ (CCIAA di Milano 60.000,00 €)
2012: 155.000€ (CCIAA di Milano 60.000,00 €)

- Number and type of beneficiaries that have benefited from the policy:

  2010: 15 firms(15 in the Milan province)
  2011: 15 firms(15 in the Milan province)
  2012: 25 firms (15 in the Milan province, 10 in the Como and Monza e Brianza province)

- Geographical area of policy intervention:

  Milan province, Italy
  Como province, Italy
  Monza and Brianza, Italy

- Name(s), number and nature of organisations/intermediaries engaged to implement the policy: the policy has been promoted by the CCIAA di Milano, *Provincia di Milano* (since 2011) and the CCIAA di Como and di Monza e Brianza (both in 2012) and it has been managed by Material ConneXion.

1. Describe this policy and its background

How did this policy come about?

The policy "Un Designer per le imprese" was born involving different actors: CCIAA, Material ConneXion, four Design Schools located in Milan and firms operating in the same area.

"*The CCIAA approach to design is not through a cultural or aesthetic view, but more a business-driven approach that focuses on competitive advantages that design could provide to our firms". "We see the design as a competitive driver particularly on the international market*". [Roberto Calugi] The policy "Un designer per le imprese" was created and promoted by CCIAA, adopting the point of view of its manager. "*The role that Milan plays as a design HUB in the national*

and European context is a primary asset for the area and its enterprises" [Roberto Calugi] . CCIAA looked at Material ConneXion Italy (MC) as a "knowledge owner" in innovative materials and their use; The Chamber perceived the potential of this know-how and decided to build with them a project focused on local firms and their capabilities, in term of innovation and related to competences built up by Design Schools in the Milan area.

Which were the strategic/political drivers from which the policy was developed?

Who is the sponsor/supporter of the policy? (i.e. where are the funds coming from?)

The institutional promoter of the policy is *Camera di Commercio Industria, Artigianato e Agricoltura di Milano* (CCIAA) that operates as a player interested in firms' competitiveness and competence enrichment. "*The most important aspect of the project is the enterprise-driven point of view, we build the policy around the firm and not for design schools*" [Roberto Calugi]. Material ConneXion (MC), the operative partner of the policy, instead manages the project and organizes the meetings between firms and young designers, following and scheduling all the phases of the project.

NOTES:

"*When I became manager of the CCIAA I thought to bring the project to an end, because I didn't believe in the role played by the "intermediary", as well as funding intermediary subjects willing to explain firms how to do their business*." [Roberto Calugi]; the difference between "Un designer per le imprese" and the other CCIAA policies is that usually direct funding are given to enterprises whereas for "Un designer per le imprese" funds are given to Material ConneXion.

"*We decided to try again the collaboration with MC because in an Italian context, made by micro-firms, a tutoring activity seemed to be potentially useful*" [Roberto Calugi].

In 2009, the institutional actors organized a public competitive bidding for 20 companies: the aim was to present a project related to the implementation of innovative materials and the creation of new products. The participation of companies, and the subsequent publication of a book-collection of all the projects developed by enterprises, added value to the initiative.

In 2010, because of a management change in CCIAA, "Un designer per le imprese" became a project managed by MC, for which the CCIAA corresponds a fund covering the 50% of the total expenditure.

In 2011 a second Institutional partner, *Provincia di Milano*, enters the policy, co-financing it; the significant firm's data-base of this institution facilitated the firm's selection and the promotion of the policy.

In the 2012 edition, two more public subjects participate to the policy, Camera *di Commercio di Como* and *Camera di Commercio di Monza e Brianza*. The entering of these institutions extended the territorial coverage of the policy, allowing a greater number of companies to be included and therefore requiring the involvement of two other design schools in the Como area: The *Accademia di Belle Arti Aldo Galli* and the *Politecnico di Milano-Polo territoriale di Como*.

Comune *di Milano* showed interest in participating to future editions of the project. "In 2013 CCIAA and *Comune di Milano* are evaluating an increase of the budget of the project to develop a wider and more structured version of the policy. The Monza and Brianza and Como chamber were involved to include more manufacturing firms. In the Milan area the 75% of the firms is service-based; instead we can find a lot of product-centered enterprises in the Como and Monza and Brianza area. "*The link we established between these two areas is extremely interesting and positive"* [Roberto Calugi].

2. **What did the policy aim to achieve?**
   What were the aims and objectives of the policy?
   Were there measurable indicators (quantitative or qualitative)?

"*The real problem for enterprises and all the productive system is that competitiveness in the last 60 years was made by wrong choices: till 1960s/1970s we grew thanks to the low labor cost, we were the 'China of Europe'; then we used the currency depreciation, and doped the market with fiscal policies; now the only strategy we can adopt is focusing on competitiveness; that is why all the policies we build must be focused on that goal: make our firms as competitive as possible. Design is one of the most important drivers in this view; Milan is a city that has 'breathed' design for more than 50 years, applied in every industry, in each sector of the business. One of our objectives with this policy is to maintain the role of design capital that Milan has built in his history, linked to the design competences that Design Schools in the area own as specific knowledge and know-how*" [Roberto Calugi]. The policy aims to enable a full and strong perception of the design relevance in the SMEs and wants to enable the use of innovative materials and innovation processes in medium-sized firms. This is the differential competitive advantage that a proactive approach in the innovation process can bring. "*The CCIAA role is to develop innovative policies for enterprises that aim to support their competitiveness in the international and national market*". [Roberto Calugi]

3. **How was the policy implemented?**

   How was the policy delivered? (e.g. through intermediaries?)

   [See Material Connection Interview Report]

   The policy is structured as a public competitive bidding through which firms are selected. CCIAA reviews and approves the policy proposed by MC, helping, during the selection process and funding MC at the end of this phase in order to cover the expenses quota. After the firm's selection, the project is ruled by MC that has the operative task to follow firms and designers throughout the project.

   Were there any networks that facilitated the implementation of policy? If so, can you describe them?

   The network that plays a major part in the implementation of the policy is MC and its partners. The net of relations that MC brings into the project is fundamental for

the project and a great enabler. MC, as a centre of research in innovative material and their application, has a wide network of raw materials producers and international users that could be useful for enterprises in terms of relations, knowledge, know-how and sourcing as well.

"*CCIAA as I said before is focused on the wellbeing of enterprises: if a firm needs or wants to develop a new product with innovative materials and MC can introduce it to a manufacturer of that material, even if it is in Pakistan or Far East, I encourage the company to go there to source that material. The international network of MC is a great enabler for the policy*" [Roberto Calugi].

4. **Who are/were the intended beneficiaries?**
   How were they identified/selected?
   1. **Announcement method**
   2. **Filtering and selection method**
   3. **Promotion by 3rd party organisations**
   4. **Number of firms which applied to receive**
   5. **Geographic span**
   6. **Industry/sector span**

"*We select those enterprises that want to innovate; we start from the demand for innovation and design not from the supply of design competencies to the firms. We strongly believe that a real path of innovation is possible only if there is a strong commitment in it, that is why we want a strong design demand in order to provide a policy*" [Roberto Calugi].

"Un designer per le imprese" is a public competitive bidding "*where all the applications are assessed and selected on the real quality of the project; it is what we call "bando a valutazione" and is the best way to make a policy work*". [Roberto Calugi]

[See Material ConneXion interview report]

"Un designer per le imprese" is a structured policy in the form of public announcement, aimed at small / medium-sized enterprises in the area of Milan, Como and Monza e Brianza; Material ConneXion develops a project proposal to be

submitted to the CCIAA; when the proposal is approved and the competitive bidding opens, the companies apply and provide information on their activities (industrial, economic data).

What was the budget for this policy?

"*The policy costs in these years amount to 475.000€ and the CCIAA financed it with 220.000€. At the end of the economic year I must explain to my stakeholders how these public funds were used, for which purpose and with what results*" [Roberto Calugi].

[See Material ConneXion interview Report]

The total budget allocated to the policy has significantly changed during the life cycle of the project as stated below:

Year 2009-2010: "total budget 200.000 €, of which 50% is funded by the CCIAA as a contribution refund on a statement of MC expenditure.

Year 2010-2011: "total budget 120.000 € of which 50% is funded by the CCIAA.

Year 2011-2012: "total budget 155.000 € of which 60.000€ is funded by the CCIAA.

"*We're thinking about increasing the budget for the 2013 edition in collaboration with Comune di Milano, bringing it to a total funding of 700.000€*". [Roberto Calugi]

How much financial support did individual organisations receive (beneficiaries)?

The beneficiaries do not receive any direct monetary financing.

5. **Which have been the direct/indirect effects of the policy? On beneficiaries? On the eco-system?**

Regarding the eco-system the approach of CCIAA is particular: "*Enterprises put money into CCIAA for many reasons, one of these is to develop programs or*

policies that can support their competitiveness: we do not fund continuing education courses, we're not an educational institution". [Roberto Calugi]

6. **Were the objectives of the policy achieved? Is there evidence of these results?**
   "*The policy has achieved many results from my point of view, which is always a business-based point of view. There are more enterprises every edition that wants to apply for the project and we have prototypes that became final products after the policy process: these are indicators of the policy success*". [Roberto Calugi]

7. **Was the policy evaluated?**
   If so, describe the process.
   Did you formally evaluate the programme (process, indicators, etc.)? If so, how?
   "*The evaluation of the policy from my point of view can be done by one indicator:*

   How many projects end with a product launched in the market. For me, as a business-driven person, this is the only aspect or the main aspect that matters". [Roberto Calugi]

   Why did you choose this evaluation method?

   What was the objective of the evaluation?

   Who performed the evaluation?

   CCIAA performs evaluation on the policy through direct contact with firms.

   For other policies, with more enterprises involved, CCIAA uses customer satisfaction survey in order to investigate what firms think about policies and the internal audit office in order to keep the efficiency of the process under control.

   What was the result of the evaluation?

   Would you change something in the DIPI given these results if you could?

   The good results achieved so far by the policy make the policy maker reflect on *how "Un designer per le imprese' is an example of focused and effective policy. This 3-year experience could be useful in order to improve the policy and make it*

wider and larger; thanks to the collaboration with Comune di Milano we should increase the budget and the number of enterprises involved" .[Roberto Calugi]

8. **Evaluating the evaluation**

   Did you evaluate the evaluation? If so, how?

   Did it reach its objectives?

   Would you change the evaluation process and method if you could?

   The evaluation was not evaluated.

9. **Close**

   ***Has* there been any previous policy which has informed or complemented this one?**

   There are not prior policies supportive or complementary to the present one, provided to or developed by CCIAA.

   Do you know any other policy, which you think, may interfere or complement the current one right now?

   "*The policy is structured in a completely different way in respect to the regional project "DECO". We started to develop the policy focusing on the innovation and design demand expressed by firms and after that we contacted Design Schools and tried to involve them into the project to improve and make good use of their knowledge and skills; "DECO" instead is a education-based policy, that starts from the supply of design and innovation; in my opinion, this is a partial approach, because without commitment enterprises use the support policy just as a funding project*". [Roberto Calugi]

Interview Case Report 2
Policy: Un designer per le imprese (Italy)
Organisation: Material ConneXion (Intermediary)
Date: 15 November 2012
Place: V.le Sarca 336/F 20126 Milan, Italy

Interviewees:

Emilio Genovesi – CEO

Material ConneXion Board of Directors' member since 2001. Since 2007 CEO of Material ConneXion Italy, partner of Material ConneXion USA, innovative material research institute.

Since January 2012 he has been working with Comune di Milano on City Operations projects related to Expo 2015.

Since 1992 he has worked with Domus Academy; as a director he developed a Design and Fashion Design MBA, he also invented and launched an Urban Management and Architectural Design Master, related to Interaction Design, Interior and Living Design and Business Design. Since 2007 he is a writer for Sole 24 Ore newspaper and its insert Nova24. From 1985 to 1992 Mr. Genovesi has been marketing and communication manager of a famous design firm.

Federica Pastonesi - Special Project

She graduated in architecture at Politecnico di Milano and attended the London Guildall University (Furniture Design). Working experience in different architectural studies at Vudafieri studio - Sistematica 2000 studio- Navone Associati studio. From 2000 to 2004 researcher at Domus Academy's Research Institute in Milan where she worked in architectural and design projects and become manager of Metaprojects. In 2008 she starts her collaboration with Domus Accademy.

She is project manager of medium-size projects, responsible of the whole project cycle: basic research, project planning and coordination of the working groups, communication and design of the final exhibition, coordination of the implementation phase.

Organization

Material ConneXion is a company and the largest center of research and consultancy on materials and on innovative and sustainable production processes, with offices in New York, Bangkok, Beijing, Cologne, Daegu, Istanbul, Milan, Seoul, Skövde and Shanghai.

Founded in 1997 in New York, with offices in Milan since 2002, the Materials Library is a physical storage of materials, consisting of over 7,000 materials and innovative and sustainable production processes from all over the world.

Material ConneXion promotes the creation of contacts between the producers of materials and potential users (companies, designers, architects, students, etc.) to support them in the search for material solutions for their projects.

Introduction

- Time period to which the policies are related: 2010 – 2012 (and probably 2013)
- Size of budget allocated to implement the policies (in EUR): approx. 500.000€ (to be confirmed in the next interview)
- Number and type of beneficiaries intended to benefit from the policy: approx. 20 firms per year
- Number and type of beneficiaries that actually benefited from the policy: approx. 20 firms per year
- Geographical area of policy intervention: Milan province, Italy
- Name(s), number and nature of organisations/intermediaries engaged to implement the policy: the policy has been promoted by the Chambers of Commerce of Milan and it has been managed by Material ConneXion.

1. **Describe this policy and its background**

How did this policy come about?

"The policy "Un designer per le imprese" was born from the pluriannual collaboration between the Camera di Commercio Industria e Artigianato di Milano(CCIAA) and Material ConneXion Italy (MC), it is a project focused on local firms and their capabilities, in term of innovation" [Emilio Genovesi] related to competences built up by Design Schools in the Milan area. This is an example of "access to design" policy, because enables firms to collaborate and use skills and competences of design schools and young designers.

Which were the strategic/political drivers from which the policy was developed?

Who is the sponsor/supporter of the policy? (i.e. where are the funds coming from?)

The institutional promoter of the policy is *Camera di Commercio Industria e Artigianato di Milano* (CCIAA) that operates as a player interested in firms' competitiveness and competence enrichment; Material ConneXion (MC) instead is the operative partner of the policy, it manages the project and organize the meetings between firms and young designers, following and scheduling all the phases of the project.

NOTES:

In 2007-2008 the collaboration between CCIAA and MC started with research projects on innovative materials and their application on SMEs. *"The research focused on how firms could use new materials, which could be the easiest way for them to gather information and use them and counselling on the application of new materials in the production processes."* [Federica Pastonesi]

In 2009, the institutional actors organize a public competitive bidding for 20 companies: the aim was to present a project related to the implementation of innovative materials and the creation of new products. The participation of companies, and the subsequent publication of a book-collection of all the projects developed by enterprises, added value to the initiative.

The policy called "*Un designer per le imprese*" was created in 2010 on the basis of these experiences to encourage dialogue between the business community and young designers (students of Schools of Higher Education and Universities) and *"To create a wider perception of the value of design and new materials among small and medium-sized firms in the Milan area (SMEs)"* [Emilio Genovesi]. The four most prestigious schools in the area participated, and engaged in this policy young students not yet graduated. Schools needed to select the 15 most promising students and together with MC coordinate the work on the projects.

In 2010, because of a management change in CCIAA, "Un designer per le imprese" becomes a project managed by MC, for which the CCIAA corresponds a fund covering the 50% of the total expenditure.

In 2011 a second Institutional partner, *Provincia di Milano*, enters in the policy, co-financing it; the significant firms' data-base of this institution facilitates the firm's selection and the promotion of the policy.

In the 2012 edition, two more public subjects participate to the policy, *Camera del Commercio di Como* and *Camera del Commercio di Monza e Brianza*. The entering of these institutions extends the territorial coverage of the policy, allowing a greater number of companies to be involved and therefore requiring the involvement of two other design schools in the Como area: The *Accademia di Belle Arti Aldo Galli* and the *Politecnico di Milano-Polo territoriale di Como*.

2. What did the policy aim to achieve?

What were the aims and objectives of the policy?

Were there measurable indicators (quantitative or qualitative)?

The policy aims to enable a full and strong perception of the design relevance in the SMEs and wants to enable the use of innovative materials and innovation processes in medium-sized firms. *"The primary objective is to focus on the value of product innovation, making firms aware of the importance of Design."* [Emilio Genovesi], and the differential competitive advantage that a proactive approach in the innovation

process can bring. The policy was evaluated in terms of new products and prototypes and with informal feedbacks from the participating companies.

3. How was the policy implemented?

How was the policy delivered? (e.g. through intermediaries?)

The policy is structured as a public competitive bidding trough which firms are selected. *"The delivery of competences from design schools to firms, which is the aim of the projects, "is controlled and enabled by us (MC) with a structured process, from the presentation of the project brief to the selection of the winning concept."* [Federica Pastonesi].

Were there any networks that facilitated the implementation of policy? If so, can you describe them?

The network that enabled the implementation of the policy was composed by the MC Italy's partners and the database of all the companies in the Milan area, provided by Provincia di Milano.

4. Who are/were the intended beneficiaries?

How were they identified/selected?

1. **Announcement method**
2. **Filtering and selection method**
3. **Promotion by 3rd party organisations**
4. **Number of firms which applied to receive**
5. **Geographic span**
6. **Industry/sector span**

"Un designer per le imprese" is a structured policy in the form of public announcement, aimed at small / medium-sized enterprises in the area of Milan, Como and Monza e Brianza; the process of selection and implementation, in the most recent version of the policy, was explained by Federica Pastonesi as follows*: "Material ConneXion*

develops a project proposal to be submitted to the CCIAA, when the proposal is approved and the competitive bidding opens, the companies apply and provide information on their activities (industrial, economic data)." Material Connexion collects entries and selects the companies that can participate to the project. Before the selection, MC meets all companies, especially to discuss the project brief, give them information, understand what they want to achieve.

All of the firms were selected depending on defined parameters:

Related to the company	**Rating**
Entrepreneurship	0-3
Risk appetite, propensity to renewal and experimentation	0-5
Capacity for technological and production innovation	0-10
Sensitivity to design and product innovation	0-10

Related to the project	**Rating**
Quality and technical feasibility of the project	0-12
Maximum score achievable (total rating)	40
Minimum score for admission	20

After the evaluation, MC presents the project brief to the design schools. Schools manage the task of selecting the most interesting students, for the assigned brief.

When students are selected, the company-students meetings begin: all schools together meet the representatives of companies, gathered for the first debrief of the project; following meetings are held separately. Students work on projects followed by tutors and helped by MC (1 tutor for every 15 students) At the end of the initiative, there will be a public exhibition at *La Triennale di Milano,* where the 4 prototypes, winners of the special prizes, the 15 prototypes developed by companies and the drawings of all the projects submitted by students will be exposed.

What was the budget for this policy?

The total budget allocated to the policy has significantly changed during the life cycle of the project. Emilio Genovesi explained the changes as stated below:

- Year 2009-2010: 200.000€

total budget 200K €, of which 50% is funded by the CCIAA as a contribution refund on a statement of expenditure, provided by MC at the end of the initiative, and the remaining 50% funded by MC.

- Year 2010-2011: 120.000€

total budget 120K € of which 50% is funded by the CCIAA, 25% by Provincia di Milano and the remaining 25% by MC.

- Year 2011-2012: 155.000€

total budget 155K € of which 40% (60.000€) is funded by the CCIAA, 20% by Provincia di Milano, 13% by Camera di Commercio Monza e Brianza, 10% by Camera di Commercio di Como and the remaining 17% by MC.

How much financial support did individual organisations receive (beneficiaries)?

"The beneficiaries do not receive any direct monetary financing. The support they receive is the possibility to develop projects with prestigious design schools without increasing staff costs within the company" [Emilio Genovesi]. MC provided advice and consultancy in the project and in the application of innovative materials to products and processes.

"The subsequent development of prototypes and products designed through the policy, is instead entirely financed by the company." [Emilio Genovesi]

5. **Which have been the direct/indirect effects of the policy? on beneficiaries? on the eco-system?**

   "The breadth of the project and the quality of the subjects involved (public institutes and design schools) increase the opportunity, for companies that will be selected, to take advantage of new resources for innovation, and to establish new contacts with other companies and institutions involved, as well as benefit from the visibility offered by the public events and communications, during the different phases of the project " [Emilio Genovesi]

   The policy enables a relationship of mutual exchange between education world and business world, in order to preserve and enhance one of the differentiating factors of Italian manufacturing: Design.

6. **Were the objectives of the policy achieved? Is there evidence of these results?**

   "The policy has achieved, and will achieve even more, those results and objectives that inspired its creation. The "increasing number of firms applying for it and the significant number of projects that completed their path from design to production, certifies effectiveness of the policy in terms of impact on the innovation and design management" [Emilio Genovesi]

7. **Was the policy evaluated?**

   If so, describe the process.
   Did you formally evaluate the programme (process, indicators, etc.)? If so, how?
   Why did you choose this evaluation method?
   What was the objective of the evaluation?
   Who performed the evaluation?

   Material ConneXion, through "*meetings and direct contact with firms*" [Federica Patonesi]

   What was the result of the evaluation?

The "*results are positive, the indicators show a crescent trend year after year: more companies want to participate, more projects are developed and many of these are prototyped*" and then produced. [Federica Pastonesi]

Would you change something in the DIPI given these results if you could?

The good results achieved so far by the policy make the policy maker reflect on how "*this could be a model useful on a larger scale than just the area of Milan, Como and Monza e Brianza*" [Emilio Genovesi]

The policy could have a larger budget to allow more companies to participate.

8. **Evaluating the evaluation**

   Did you evaluate the evaluation? If so, how?

   Did it reach its objectives?

   Would you change the evaluation process and method if you could?

   The evaluation was not evaluated.

9. **Close**

   Has there been any previous policy which has informed or complemented this one?

   There are not prior policies supportive or complementary to the present one, provided to or developed by Material ConneXion.

   Do you know any other policy, which you think, may interfere or complement the current one right now?

   It should be noted that only "one policy of support may interfere with "*Un Designer per le imprese*", since it focuses on the same topics but has been developed in a conceptually different, if not opposite, way. The policy is a regional project called DECO. In this policy, the company receives a full refund on the cost of prototyping, design and putting into production a new concept, without

encourage the contractor to make an informed and conscious choice among the available projects"- explained Emilio Genovesi.

"For designers the lack of real confrontation with the employer on the ideas that may have a commercial value involves a problem of detachment from reality that cannot be filled." [Federica Pastonesi]

According to Material ConneXion, the policy, implemented and improved incrementally edition after edition, can be ascribed to the Best Practices and taken as a model. The policy can be expanded and made structural, seen the remarkable results achieved with the implementation in the Milan area at first and then in the reality of Monza e Brianza and Como. "The growing interest of major public subjects (*Comune di Milano* for example) in the project confirms its effectiveness and underlines the future improvements that institutions can make on it" – said Emilio Genovesi.

Interview Case Report 3	Beneficiary: A4Adesign
19 December 2012	Milan, Italy
Milan, Italy	

Interviewee:

Giovanni Rivolta:

Giovanni Rivolta alternates, already as a student, experiences abroad with internships in Dortmund at the office JP Kleihues Architect, and in New York at the Peter Eisenman Architects.

After graduating in architecture at Politecnico di Milano, he moved to Berlin where he worked with the company "Dioguardi" for the design of residential areas.

In 1997 he is in St. Vincent & the Grenadines, West Indies, for the project of a luxury resort and in 1998 took part in a project for Deutsche Bank and Deutsche Bahn in Germany with the studio "Michele De Lucchi".

In 1999 he founded the architectural studio "A4A" that deals with design and interior design in Italy and abroad, with Chiara Monti and Nicoletta Savioni.

In 2002 he founded, again with Chiara Monti and Nicoletta Savioni, the A4Adesign, a company that designs and produces furniture, objects and scenes honeycomb cardboard.

In 2006 and 2007 he is a consultant Senior Architect in "Della Italia" (Indo-Italian Joint Venture) based in Mumbai, for retail projects and hotels in Hyderabad and Mumbai, private construction in Dubai and Kenya.

He is currently working full-time as an architect and designer in the two companies he founded.

Introduction

A4Adesign is based in Milan and, since 2002, has been involved in the creation and production of design objects and furniture in honeycomb cardboard.

The company designs and manufactures cardboard stage settings, installations for exhibitions and commercial areas and for refreshment and recreational areas for adults and children.

All in recycled, recyclable and reusable cardboard.

Sales:	
2010	290.000€
2011	300.000€
2012	300.000€
Employees:	
2012	6

The company is run by architects Nicoletta Savioni and Giovanni Rivolta, from leading Italian and international studios, which still run their own business. Architecture strongly influences the approach of these professional project managers, designers, set designers and communicators.

"*We discovered cardboard casually, and at first it was a parallel activity to our main occupation as architects, becoming a full-time job after much vetting.*

Right from the start, creating urban designs with a strong aesthetic and social impact, we exploited the fun side of cardboard. And that fun is now part of our modus operandi.

We got into cardboard both with a vested interest and out of curiosity. And working with this material has opened up exciting new opportunities and ideas, as well as enriching us professionally thereby allowing us to offer more to our clients by constantly dreaming up new and engaging projects.

Without wavering. We go into what the product is and what its components are, resolving any glitches the material may have and driving it to its highest potential. This way we hone our outlook and the project moves towards a status of excellence.

Using cardboard in unconventional ways turned an idea into a concrete, strong, resistant, light and poetic project.

A4Adesign was founded to provide continuity and freedom for this project. Its positive and responsible approach aims at giving a formal and functional answer with each of its creations. And also to look at things from a different angle together with the people and the companies who decide to enter into its world."[www.A4Adesign.it]

Section A: Why and how did you receive the support? (The policy)

1. **Why did you apply for the policy support?**

What was the purpose of your firm participation?

"We applied to the policy thanks to a direct contact with MC, we had our head office just in front of their one and they proposed us this opportunity."

"We probably would not have taken part to the policy without that direct contact with MC. This is because we are a design firm, a firm that provide services and objects totally soaked of design essence, because this is our sector, is what we studied, we are all designers or architects into the firm, that's why the last thing we could think about was search for an help in a design project, work with other external designers." [Giovanni Rivolta].

The firm applied seeing the policy as an opportunity*. "We decided to take the chance of the policy and try what other designers, like us, could develop in term of products and views, different from our ones."*[Giovanni Rivolta]

What were your expectations?

"Actually as I explained before our application was due to the contact with MC, we decided to try and apply for the project but our expectations were quite low. We thought that no useful ideas or innovative products could come out from other designers, I mean, we work with that material and we have the expertise so we looked to the policy with a little bit of scepticism.

Instead this experience has helped us to have new ideas, ideas of students who did not know the material and its processing, a material that comes from another context of use. We had ideas of people who have not had for ten years in its hand the material and therefore had a completely different way of seeing it and work with it." [Giovanni Rivolta]

Did you have any indicators (quantitative or qualitative) to measure the achievements of these expectations?

The enterprise does not present indicators or evaluative systems concerning achievements or results compared to expectation. *"We don't have formal system of evaluation; I have to say that our company has weaknesses on the managerial side. We are all designers and architects, we have managerial skills just derived from experience, we don't have formation on this field; for us is a problem, is something we have to think about in the future."* [Giovanni Rivolta]

What support did your firm receive?

Funding? Tools? Consultancies? Please specify (e.g., amount of funding, intermediaries involved, etc.).

The support A4Adesign received was the same for all the enterprises involved into the DIPI, they received support in term of knowledge and know-how, *"we collaborate with young designers and this was a very positive experience. We were sceptical at the beginning but we had an inspected contribution. The young designers gave us an interesting point of view about the material; MC enabled the research and helped them. Some teams looked for different materials in order to be more innovative and associate them with the honeycomb cardboard. From our point of view, instead, MC was more an operative partner, a coordinator. They helped us with Design Schools and with the meetings. We did not see students' tutor during the all project and that was a pity because they could give something to the policy with a greater involvement".* [Giovanni Rivolta]

What has happened during the policy?

What did you do?

"The project began with a meeting, we met students and Design Schools all together, with the help of MC and we discussed the brief we proposed.

After the first meeting the teams started to work on the project independently, we had after a while review meeting with them. We gave them feedbacks about the project on-going and we tried to transmit them the firm philosophy, how we look the world and our job. MC helped us in the organization of these meeting at first but after we had direct contacts with the team. We didn't want to influence the young designers too much, we wanted to let them free to experiment and see the results." [Giovanni Rivolta]

Who was involved?

"MC was the most involved into the project, we had always its support and its help. Regarding Design Schools as I said before, we did not see a commitment of tutors. I think that a more active role of tutors or professors in the policy could bring better concepts and could help students to figure out better the project's brief and what is fundamental for an enterprise in term of business. " [Giovanni Rivolta]. The role of

CCIAA and Provincia di Milano was, instead, during the DIPI, more sheltered. Their roles were central in the first phase of selection and in the last one during the award ceremony.

Were you already doing these things before?

"We are a design-centred firm, design is basic in our daily work. We usually develop our project in a similar way compared how the policy works, in our work we usually develop exhibit for customers or we produce particular furniture for specific purposes, the customer gives us a sort of brief, the objectives he has for the project and a number of constraints and we develop the project starting by the brief itself. So we can say that we were used to this practices, we were used to this particular concept development process." [Giovanni Rivolta]

Was your firm satisfied with the policy?

Did the result/impact meet your expectations? (Would you apply again?) Why?

"It was a positive experience, young designers were prepared even if in the end the winning project didn't go into production. We have it in the drawer if one day the catalogue should ever take off there would be a place for it. We are a very small firm, we have to prioritize and for now the project was not a priority for us because the idea of catalogue is still just an idea." [Giovanni Rivolta]

How did you measure the results/impact?

How do you think results/impact could have been measured?

"We just do a direct control, as a small business we do not usually measure this kind of innovation with indicators but just linked to profit and revenues." [Giovanni Rivolta]

Were the results of your participation to the policy evaluated by the policy makers? How? How would you propose to evaluate your participation to the policy?

"With MC we had several direct contacts both during and after the policy. They asked about our impressions and our feedback on the policy, the process and in general its effectiveness." [Giovanni Rivolta]; the firm did not receive any survey or questionnaire provided by CCIAA and did not have any direct contact with the promoter of the policy.

Section B: What happened after the end of your participation to the policy (the effects)?

Now that the policy support is finished (e.g., you have used all the funds, the consultancy has ended, etc.) do you think that something is different inside your organization thanks (directly or indirectly) to the policy? Why? How?
Were you already investing to obtain these changes?
"In our small company nothing changed very much after the policy, we are a micro-enterprise and our investments on innovation regarding also materials and processes are very low. We do not produce anything internally, we just design and draw furniture and products but the only process we have is the creative one." [Giovanni Rivolta]

In particular:
Do you think that something has changed in your processes? What has changed? Why? How?
"With regard to the product development we have a strong expertise because it is the main activity that we do in our firm. Our interest was to see how a "colleague", a young newly formed, alien to our world would have develop regarding the brief we provided. This interest was central because these processes are things that we normally do, and that we have forfeited as automatic, a change of point of view is the thing can help us more in reconsidering our procedures." [Giovanni Rivolta]

Do you think that your firm has learned to approach innovation from new perspectives? Why? How?
Do you think that your firm has learned to better understand how customers think? Why? How?
"The provision of young designers was really important for that aspect, first they gave us a feedback on how we are perceived outside, was a point of view on our work and on what we do. Secondly we deal with international students and this was really interesting because it gave us not only an insight on the way of thinking and working of people of different culture and formation but also provided us a show of the techniques that some of these teams used and that we did not know before". [Giovanni Rivolta]

Do you think that your firm has learned how to make your technologies more accessible to customers? Why? How? NOTE: this relates to the "Applying new technologies" capability

Do you think that your firm has learned of how to better visualize and prototype new product, services and ideas?

Section C: Design and Design policies

Relationships with Design

What was your relationship with Design before the policy?

(e.g., did you have designers in your company? Did you have relationships with design companies; etc.)

"As I said yet we are a design-driven firm, we work not only with design but I would say in the design world. We are all designer in the company, we understand deeply the importance of design as a competitive advantage. For example I our work, the cardboard is a common and poor material, is the design interpretation of it that matters. The idea that honeycomb cardboard can be used as an indoor furniture material is central; the change of meaning permit to perceive in a different way a material that has commonly other uses. Is a change of paradigm, a change of context". [Giovanni Rivolta]

How your relationship with design changed thanks to the policy?

What is your relationship with Design now?

"We tried to involve the team that won the project in other works. They came in our firm and presented other concepts about products we could insert in a catalogue but after those meetings we did not have other contact with them. For us is possible in the future to try to involve external designers in our development process, we understand that a "fresh" point of view can be an advantage for a firm like us". [Giovanni Rivolta]

Did you participate to other design policies? Would you apply again for a design policy? Which one? Why?

"For us was the first time and the first participation to a policy like that, as I said was a positive experience with some weak point, particularly regarding the commitment of tutors, but I think it can help an enterprise. The policy can make a firm look inside itself and be aware of what it does and how it does thing in order to improve them". [Giovanni Rivolta]

Interview Case Report 4	Beneficiary: Merli Marmi
19 December 2012	Milan, Italy
Milan, Italy	

Interviewee:

Paolo Merli: President & owner

Since the early years, Paolo Merli shows a keen interest in the artistic activity of sculpture of which admires the plasticity and learns the rules of execution. He was born in a family dedicated to sculpture monuments. The family environment rich in values and entrepreneurial examples marked him deeply. Over time he develops a personal aesthetic concept that manifests itself in the early works, expressing a set of: craft, art and design. The originality of his message and the professional skills have allowed him to tackle the Merli Marmi successfully meet the international scene, remaining linked to family tradition.

Introduction

The company is a small company that operates in the province of Voghera, is present in the marble sector for many years and this is its core business. The company views the problems of the sector and thanks to the thrust of its chairman and owner has tried to innovate and continues to pursue advanced projects related to the field of marble.

Sales:	
2010	370 k€
2011	390 k€
2012	470 k€
Employees:	
2012	4+1

Section A: Why and how did you receive the support? (The policy)

1. **Why did you apply for the policy support?**

What was the purpose of your firm participation?

"Everything started in 2006; we participated in a project promoted by "Union Camere" of Milan where we had a very big investment for the company in order to reduce the environmental impact by installing solar panels. We worked on energy, water, dust,noise and waste. From this project was born a trademark: "Marmi style" thanks to the use of water jet machines we have been able to cut even the smallest scraps of marble which would otherwise be thrown away. We were able to bring back the harmony and perfection in a contemporary, modern, futuristic language."

"We decided to combine Art and Design" from that experience derived the idea of apply also for "Un Designer per le imprese" sponsored by CCIAA. "We said, we have new collection, a new vision, and a new way of working, let's try to complete this transformation with an external point of view, external not only compared to the company but also to the industry". [Paolo Merli]

2. **What were your expectations?**

"Reading the statement of policy "Un designer per le imprese" and deepening the content, I realized it was perfect for us at that time. We had already developed this type of collection ("Marmi style"), we were vying to participate in a project and to make an exhibit in the U.S., and we had to question ourselves on the actual goodness of our products.

We wanted to get a feedback on our path using a new point of view, a not affected or influenced one. "Un designer per le imprese" was a low cost opportunity for feedback on "Marmi style" as the first thing, and secondly we could have the opportunity to work with resources that difficult would look at reality as small as our firm." [Paolo Merli]

3. **Did you have any indicators (quantitative or qualitative) to measure the achievements of these expectations?**

"We actually do not have any indicator in order to analyse the grade of fulfilment of these expectations. We are such a small reality that for us the cost of implementing something like that would be more than the benefits. For us is enough being aware of our economic performances in order to evaluate if an expectation is achieved or not." [Paolo Merli]

What support did your firm receive?
Funding? Tools? Consultancies? Please specify (e.g., amount of funding, intermediaries involved, etc.).

The support Merli Marmi received was the same for all the enterprises involved into the DIPI, they received support in term of knowledge and know-how, "Regarding MC we received help in coordination activities. In our case, it did little good, because we already had the raw material and then we did not care at this stage to think of other types of material. The impact with students instead was interesting and positive; they provided an original view on the marble industry and products you can create with this great material. They did not have deep skills in terms production techniques in the marble sector but we helped them with it. After this experience, we have tried to do collaboration with a professor of the Polytechnic of Milan for the development of collections and I had a truly dramatic experience, he had absolutely no idea what he meant marble today. Ultimately much better the contribution of the students." [Paolo Merli]

3) **What has happened during the policy?**

a) **What did you do?**

"MC and the Design Schools came in our firm for a first general meeting regarding the brief; we explained the project, the goal we wanted and all the constraints we included in order to have a product that could be available for the market, we talk about price and cost constraints. In that meeting I understood the difficulty of our brief, I had to explain to young designers how we work and our production processes because they did not have clue about them. We explained the water-jet technology and they were astonished about its use in the marble industry." [Paolo Merli].

b) **Who was involved?**

"We had frequent contact with some of the teams, particularly one of the young designers that developed the project alone. He came many times in our company in order to discuss the project, understand the company's philosophy and the

production cycle, other team instead arrived at the end of the policy with a project developed without any meeting with me, they did not understand the firm, they did not understand the sector and what we want to produce. Also MC was involved in the project, it helped us with student and with the first meeting", CCIAA instead was present just at the end of the policy, in the exhibition made at Triennale di Milano. [Paolo Merli]

c) **Were you already doing these things before?**

"No, we had just a collaboration with external designer. This experience, the process we used in the ongoing of the collaboration with Design Schools and young designers was absolutely original. We did not have done anything similar before". [Paolo Merli]

4) **Was your firm satisfied with the policy?**

Did the result/impact meet your expectations? (Would you apply again?) Why?

The result of the DIPI was positive. "We applied in order to create a product with a potential market bigger than the one we have for the other products, we wanted to change the paradigm in the marble industry, we want a product that is ready for the customer, something we propose to him and not only the contrary, something that can be proposed in a catalogue, or on an ecommerce channel, the result of the policy was satisfactory, the winning team proposed a nice product, an innovative seat that can be an internal piece of design but also an outdoor furniture, an outdoor piece of art at a reasonable production cost, this was the goal and we achieved it so we are happy". [Paolo Merli]

b) **How did you measure the results/impact?**

c) **How do you think results/impact could have been measured?**

"As I said before we are a micro-cup and systems of indicators are out of our possibilities for now. We see the result of a product when we look our balance sheet, our revenues and our profits". [Paolo Merli]

4) **Were the results of your participation to the policy evaluated by the policy makers? How? How would you propose to evaluate your participation to the policy?**

"MC contacted us after two or three months after the DIPI ended, they proposed us a sort of survey, a questionnaire about the policy, we had to evaluate it in term of effectiveness and efficiency. Regarding CCIAA, they contacted us just in October, they invited us to the presentation of "Un Designer per le imprese" 2013 edition; in that context they asked us about the policy, they asked us our impressions". [Paolo Merli]

Section B: What happened after the end of your participation to the policy (the effects)?

Now that the policy support is finished (e.g., you have used all the funds, the consultancy has ended, etc.) do you think that something is different inside your organization thanks (directly or indirectly) to the policy? Why? How?
Were you already investing to obtain these changes?

"It is an evolution that started even before "Un designer per le imprese" and gave us the positive awareness of two things: first that you can do innovation with the marble, second that is actually hardly marketable, but this is a subjective criticism of the industry". [Paolo Merli]

In particular:
7) Do you think that something has changed in your processes? What has changed? Why? How?
8) Do you think that your firm has learned to approach innovation from new perspectives? Why? How?
9) Do you think that your firm has learned to better understand how customers think? Why? How?

"I would not say that something really changed in what we do, because we use the same technology, we follow the same business direction but obviously changed the approach we have to it. I can say that produce marble pieces of art-design and propose them directly to the costumer is a completely different approach than the usual one in our sector, is an innovative paradigm." [Paolo Merli]

Do you think that your firm has learned how to make your technologies more accessible to customers? Why? How? NOTE: this relates to the "Applying new technologies" capability

Do you think that your firm has learned of how to better visualize and prototype new product, services and ideas?

Section C: Design and Design policies

Relationships with Design

What was your relationship with Design before the policy?

(e.g. Did you have designers in your company? Did you have relationships with design companies; etc.)

"We had a collaboration with an external designer in order to develop our "Balene" collection, the result was negative, we completely mistake the target market of that product, we developed something very costly that could be perfect in the middle-east and in countries like UEA, but we did not have the assets to serve such a distant market. Our prices for Europe are too high; the collaboration was a sort of failure". [Paolo Merli]

How your relationship with design changed thanks to the policy?

What is your relationship with Design now?

I was very interested also before in the concept of design, regarding all the aspects of a product development. Obviously the aesthetic was the first point but in a marble product also the essence, what I call subject is important because it is the significance of a product, the meaning you want to share with your customers. Now I know that there is always a point of view that can be useful for a firm in order to

be ready to changes in every time of its life, this is the most important thing". [Paolo Merli]

Did you participate to other design policies? Would you apply again for a design policy? Which one? Why?

"We did participate to other policies before this one, we applied to a policy focused on internationalization of firms through the design as an Italian core skill but we saw that in some of them I can say politics was more important than the actual value of the company.
I think that this policy is a good example of what is really useful for little and micro enterprises are a perfect starting point". [Paolo Merli]

Interview Case Report 5	Beneficiary: TucanoUrbano
10 December 2012	Milan, Italy
Milan, Italy	

Interviewee:

Mirko Tambascia

Graduated from “Secoli di Milano” school as an industrial modeler.

Graduated with honors in Design Industriale, Faculty of Architecture, and Polytechnic of Milan.

2006: Product manager of Tucano Urbano gloves. In particular I take care of all the design project, development, production and after-sale service.

2007: Product manager of Termoscud (cover legs for scooter representing the core business of the company). In particular I deal with the project, prototypes, samples, production, and quality and with customer service.

2009: Responsible for store designs of Corners e Shops Tucano Urbano.

2010: I have designed a collection of waterproof backpacks for motorcyclists, assembled with welding seam technology. I have developed the Tucano Urbano airbag in collaboration with Motoairbag, a module to be applied directly to prepared jackets.

2012: Assumed to be the responsible of the development and production of technical products (cover legs, gloves, helmets, bags, etc.).

2004-2012: Designer freelance for Tucano Urbano developing accessories and clothing for a motorcycle market.

Introduction

Tucano Urbano is specialized in clothing and accessories for motorbike’s enthusiasts, the company will appeal to lovers of movement in the city, regardless of the seasons and weather conditions. There are no limits for those who travel every day on two wheels. "In motion always in motorcycle" is the motto that accompanies all collections.

Brand of clothing and accessories for scooters and motorcycles founded in Milan in 1999, today has a turnover of more than € 10 million and continues to grow. Before devoting himself to clothing and accessories for motorcyclists, Tucano was producing computer bags.

In 1999 there was a turning point for the company from this time forward Tucano will continue to manufacture backpacks and Pc bags, while the world of two wheels become independent with the addition of the “Urban” adjective.

The first product launched was Termoscud, the "cover legs" that protects from the cold and rain (in Italy did not exist before). By itself, the blanket was a nice insight, but the creativity and freshness of Tucano Urbano led to the proposal of colors and designs that have flooded dozens of jackets, vests, gloves and hats of their catalog. At Tucano Urbano gave a very simple model, and today produces more than 20 variant and the price ranges from 65 to 100 euro.

Then came the rain clothing: the windscreen and gloves, so over time Tucano Urbano continued the “battle” against bad weather, conquering scooter riders and motorcyclists, with a wide range of products that meet all needs and tastes (motorcyclists metropolitan travel lovers, elegant young professionals or fashion).

Tucano Urbano is owned by four partners: Francesco Colombo, Claudia Bertolotti, Nicholas Lurani, and John Monti. Only a small part of the production is done in Italy, the rest of it is done by outsourcers in Far East. They have an organizational model almost perfect. As Francesco Colombo say: "We started as a family and a group of friends, we have grown a lot and with great satisfaction."

A very clear vision of their targets also resulted in decisions seemingly unusual, such as the sale of items without any protections that can be purchased separately, as Francesco Colombo explains: "The protections affects the final price of a product for an amount of 30-40€, so why buy for each item? It only takes a budget that you buy separately and that applies to various jackets. So you also save in terms of space in the closet ".

In April 2012 Consilium SGR, fund management companies, acquired by the founders of Tucano Urbano Ltd. a majority stake. It is a planned capital increase ahead of an ambitious development plan for an expansion of production and distribution in the most important European markets.

Sales:	
2010	15,8 mln €
2011	13,6 mln €
2012	11,4 mln €
Employees:	
2012	30

Section A: Why and how did you receive the support? (The policy)

Why did you apply for the policy support?

What was the purpose of your firm participation?

The participation to the policy was a double opportunity. "We participated in 2011 with a project that we proposed about protection for clothes and garments." [Mirko Tambascia].

"On one hand was possible to know new designers to be involved not only for the specific project but also for the future, the second is to work with Material Connexion (MC) and then have access to a database of materials that regarding protections permit to address a great amount of the problem, the bulk of research is on materials for that kind of projects.

It also gives out this project we have in her lap for a long time but a little of resources make priorities for we were not able to carry it forward.

Comes the call (newsletter), we find the call was an interesting occasion twofold: on the one hand to know possible designers to be involved not only for the specific project, the second is to work with MC and then have access to a database of materials specifically guards problem is 90% of the project, the bulk of research on materials.

Also there was the possibility of involving external resources on this project that internally we could not carry on due to lack of time and priority." [Mirko Tambascia]

What were your expectations?

"Since Tucano Urbano has, in fact, two souls: one more related to mobility and another more fashionable, you had to understand what kind of protection do and in what clothes put them. The company wanted to come up with a new security tool, a protection that must be strongly "tucanized", it must be part of our DNA, and otherwise we should go to a contractor and buy it with less effort and expenditure." [Mirko Tambascia]

***Did* you have any indicators (quantitative or qualitative) to measure the achievements of these expectations?**

"I have to say that we did not use any measure or particular indicator to see if our expectations were fulfilled, we are a small business with employees that have many different tasks and we cannot usually go through such procedures in our daily business life. We saw the policy as an opportunity to develop something we were thinking about." [Mirko Tambascia]

1) What support did your firm receive?

Funding? Tools? Consultancies? Please specify (e.g., amount of funding, intermediaries involved, etc.).

The support Tucano Urbano received was the same for all the enterprises involved into the DIPI, they received support in term of knowledge and know-how, *and "The collaboration with young designers that have a view and a knowledge that differs from our firm competences was very interesting. Competences they brought in and the external point of view was fundamental during the project."* [Mirko Tambascia]. *Regarding the participation of the intermediary into the project, "I have to say that we had direct contacts with MC but the main help they gave us was directly to young designers in terms of materials and material treatments. One of the young designers wanted to try a new material for the protection but through MC he cannot procure a sample of it, then we intervened and helped him to find and receive the material for testes."* [Mirko Tambascia]

2) What has happened during the policy?

a) What did you do?

"The policy started with a general meeting with the four Design Schools and the promoter of the project, MC. We explained the project brief to the students and after that we gave our availability to meet with the project team and discuss progress of the concept. The only problem I can underline was about the feasibility both economic and technical one, we met all the groups and we helped them to understand what parameters and constraints we have." [Mirko Tambascia]

b) Who was involved?

"With Federico, the winning designer, we have been several revisions, three/four times just to dissect the problem and find solutions together. In the other three cases, we met the teams at the first briefing and we ended with the project in hand, without any meeting with designers in the meantime and we found them unsatisfactory. I think there must be more moments of confrontation with the company, you cannot expect in an hour or so to understand a company's philosophy or way of thinking. It was a limitation of the team, not of the project, because Federico has taken advantage of our availability." [Mirko Tambascia]. The role of CCIAA and Provincia di Milano was, instead, during the DIPI, more sheltered. Their roles were central in the first phase of selection and in the last one during the award ceremony.

c) Were you already doing these things before?

"There is an external designer that collaborates with us on packaging and advertising but was the first time we tried a product development in this way." [Mirko Tambascia]

3) Was your firm satisfied with the policy?

Did the result/impact meet your expectations? (Would you apply again?) Why?

"We were lucky because the young designer, Federico Lei, with whom we have brought forward the research, wanted to get involved. He had an easy time in the competition because other groups have rejected the specifications of the brief, and presented superficial and shoddy projects. He was alone and it was supported by a tutor within the Polytechnic of Milan. With Federico there was a proposal that

created an innovative collaboration with a double result: while he brought us innovation on the hand we have helped him to develop his thesis project (back protector) just after the policy.

I see two advantages regarding "Un Designer per le imprese": the first is that young designers are not within the company and are not affected by our common vision, which is critical for innovation, as well as open-minded and competent on different business sectors and that allows to transfer knowledge to us, the other advantage is to have a time management focused, students are not affected by daily problems. On 10 hours I will have 10 minutes to make innovation the rest is business as usual, so the process is very slow in small companies. There are things that are idle years in the drawer and then it is said that more should be good and you have to throw it all away. For me it is absolutely an advantage to outsource this type of project.

I would change the policy a bit 'more time to develop the concept and more control by the tutor*."* [Mirko Tambascia]

a) How did you measure the results/impact?

b) How do you think results/impact could have been measured?

"We just do a direct control, as a small business we do not usually measure this kind of innovation with indicators but just linked to profit and revenues." [Mirko Tambascia]

Were the results of your participation to the policy evaluated by the policy makers? How? How would you propose to evaluate your participation to the policy?

"We had no direct contact with CCIAA until November 2012 when they invited us to the presentation of the 2013 edition of the policy, in that case we have publicly expressed satisfaction with the project. MC contacted us after the DIPI ended and we discussed with them about our impressions." [Mirko Tambascia]; the evaluation of the policy was direct by policy maker, as reported in their interview reports they did not use quantitative or statistical tool in order to evaluate the DIPI but because of it dimension they operate through direct evaluation, direct contact with firms.

Section B: What happened after the end of your participation to the policy (the effects)?

Now that the policy support is finished (e.g., you have used all the funds, the consultancy has ended, etc.) do you think that something is different inside your organization thanks (directly or indirectly) to the policy? Why? How?
Were you already investing to obtain these changes?
"Within our company has not changed much. The process of innovation was already acquired, because three years we have internally a designer who, with an approach a little 'more academic and less managerial / business, helps us to develop our collections." [Mirko Tambascia]

In particular:
Do you think that something has changed in your processes? What has changed? Why? How?
Do you think that your firm has learned to approach innovation from new perspectives? Why? How?
Do you think that your firm has learned to better understand how customers think? Why? How?
"The company carries on the innovation trying to figure out, what are the latent needs of those who go on motorcycle today, or how to improve a product that already exists. We work for six months in six months: winter and summer collection. With each season you do a review on the products that exist in order to improve them or remove them from the catalogue, everyone works together. We are small and we all work in an open space so we have more contributions to the joint work. We have then a part of the new product more closely tied to the fashion of the moment.
We now would like to go into production with all the necessary adjustments.
Before arriving at a planning stage production with Federico, we have to clarify our ideas on how the needs of our customers are changing. The future is, for example, the lawyer that uses motorbike, we need protections that disappear in the garment, and we want something of minimal impact on the clothes. There is a

major problem in urban mobility in Italy because users are not aware about the problem of security, so, they often miss the added value of protection but they captures the added cost of it. We prefer to keep a lower cost". [Mirko Tambascia]

Do you think that your firm has learned how to make your technologies more accessible to customers? Why? How? NOTE: this relates to the "Applying new technologies" capability

Do you think that your firm has learned of how to better visualize and prototype new product, services and ideas?

"Federico was innovative because, being able to use the university laboratories, he made a prototype in Stereo, which is a technology that we do not have in-house and we have known and certainly will use in the future. We are talking about a moulding 3d technology. From AutoCAD you can produce a physical prototype of the part straight away. We knew it but we had never used it. We understood the potential of technologies like this in term of visualisation." [Mirko Tambascia]

Section C: Design and Design policies

Relationships with Design

4) What was your relationship with Design before the policy?

(e.g., did you have designers in your company? Did you have relationships with design companies; etc.)

"Tucano Urbano passed from a functional product not always aesthetically good, to a product that is functional but also beautiful. Aesthetics as perception, farm is becoming increasingly important. We are using external consultants; this is an independent evolution of the policy. The Italian SMEs until yesterday had a certain type of market and was content to do his part in the same manner. The market is changing and we can no longer make the "price war", the company must innovate, bringing in the Italian spirit that we are recognized for worldwide which has become crucial for the survival of micro-enterprises Italian. And then the relationship is changing, before they were entrepreneurs to make their products

today with the help of trained people in a more systematic way carry on the new concept." [Mirko Tambascia]

5) **How your relationship with design changed thanks to the policy?**
6) **What is your relationship with Design now?**

"We are interested in a relationship of this kind: he is a freelancer and we are one of its customers, in that way we have a person, extern from the company, with a much more global perspective due to working in different sectors." [Mirko Tambascia]

Did you participate to other design policies? Would you apply again for a design policy? Which one? Why?

"It's the first time we participate in such policies. Within the company, was born the desire to develop relationships with universities in this type of project, we are working on it. We have seen the importance of opening up to collaboration with universities thanks to "Un designer per le imprese." The possible research collaboration between universities and business seems to us something interesting." [Mirko Tambascia]

8. References and Bibliography

Abecassis-Moedas & Mahmoud-Jouini, (2008); Absorptive Capacity and Source-Recipient Complementarity in Designing New Products: An Empirically Derived Framework

Adams R., J. Bessant, et al. (2006), "Innovation management measurement: A review." International Journal of Management Reviews 8 (1): 21–47

Acklin C. and Hugentobler, (2008); Acklin C (2013), Design Management Absorption Model – A Framework to Describe the Absorption Process of Design Knowledge by SMEs with Little or No Prior Design Experience

Acklin C. (2010, 2011) Design-Driven Innovation Process Model Design. Management Journal Volume 5, Issue 1, pages 50–60

Amit, R. and Schoenmaker, P. (1993) Strategic Assets and Organizational Rents. *Strategic Management Journal*, 14, 33–46.

Anderson, J. E. (2003), Public policymaking: An introduction. Boston: Houghton Mifflin Company

Azzone G. (2006), "Sistemi di controllo di gestione", Etas libri, Milano

Bager-Sjögren, L., Hovlin, K., Pelli, A. (2007) Politik för design, Institutet för Tillväxtpolitiska Studier, Östersund

Bardach E. (1977). *The Implementation Game: What Happens After a Bill Becomes a Law*. The MIT Press, Cambridge, Massachusetts (second printing, 1979).

Barney J. (1991) Firm Resources and Sustained Competitive Advantage. Journal of Management

BEDA Communication Series (2002) The value of design for the European Economy stimulating wealth creation: the European creative industries and the role of design within them

Bedford C, Hertenstein JH, Plat MB and Desbarats G. (2006). Profiting by Design. *Design Management Review*, Vol. 17, No. 2, Pp. 54-59

Biloslavo, R. (2005), "Use of the knowledge management framework as a tool for innovation capability audit." Int. J. Innovation and Learning 2(4)

Björkdahl and Holmén (2012) Business model innovation – the challenges ahead; Department of Technology Management and Economics, Chalmers University of Technology

Boland RJ and Collopy F (2004), *Managing as Designing*, Stanford CA: Stanford University Press

Borja De Mozota B. (2002), Design and Competitive Edge: A Model for Design Management Excellence in European SMES. *Design Management Journal*, Vol. 2, Pp. 88-103

Borja De Mozota B. (2003), *Design Management – Using Design to Build Brand Value and Corporate Innovation*. Allworth Press

Borja De Mozota B. (2006) The Four Powers of Design: A Value Model in Design Management. *Design Management Review*, Vol. 17, No. 2, Pp. 44-53

Brown T. (2008), Design Thinking. *Harvard Business Review*, No. 6

Brown T. (2009), *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*: HarperBusiness

Bruce M., Cooper R. and Vasquez D. (1999) Effective Design Management for Small Businesses

Bruce M. and Bessant JR. (2002), Design in Business: Strategic Innovation through Design. Financial Times Prentice Hall (a Pearson Education Company)

Candi (2010), Benefits of Aesthetic Design as an Element of New Service Development. *Journal of Product Innovation Management*

Chiesa V., Coughlan P., Voss C.A, (1996) "Development of technological innovation audit", Journal of production and innovation management

Chiesa V., F. Frattini, et al. (2009), "Performance measurement in R&D: exploring the interplay between measurement objectives, dimensions of performance and contextual factors." R&D Management 39(5)

Chiva R. and Alegre J. (2009), Investment in Design and Firm Performance: The Mediating Role of Design Management. *Journal of Product Innovation Management*

Choi (2009) A comparative study of national design policy in the UK and South Korea

CIDA (2008) Results-based Management - Policy Statement: Amended Terms and Definitions. Canadian International Development Agency

Cobb, R. W., & Elder, C. D. (1972), Participation in American politics. The dynamics of agenda building. Boston: Allyn & Bacon

Cohen, W. and Levinthal, D. (1990) Absorptive Capacity: A New Perspective on Learning and Innovation. Administrative Science Quarterly, 35, 128–52.

Cormican, K. O. S., David, K. O. S., David (2004), "Auditing best practice for effective product innovation management" Technovation (24): 819-829

Cox R.F, Issa R.R.A, Ahrens D, (2003), "Management perception of Key performance indicators for construction", Journal of construction engineering and management

Cox G. (2005) *Cox Review of Creativity in Business: Building on the UK's Strengths*. Design Council, London.

Crawford F. and Mathews R. (2001); The Myth of Excellence: Why Great Companies Never Try to Be the Best at Everything

Creusen MEH and Schoormans JPL (2005), The Different Roles of Product Appearance in Consumer Choice. *Journal of Product Innovation Management*, Vol. 22, Pp. 63-81

Danish Design Centre, National Agency for Enterprise and Housing. The Economic Effects of Design, Copenhagen: 2003 in Bitard & Basset 2008

Danish Enterprise and Construction Authority (2007) (Danish Ministry of Economic and Business Affairs), 'Et billede af dansk design — udfordringer og perspektiver'

Davis S., Albright T. (2004), "An investigation of the effect of balances scorecard implementation on financial performance"

Dell'Era C., Altuna N. and Verganti R. (2013), What is the payoff of Design-Driven Innovation? Analysing the contribution of mediating and contingent variables on the relationship between investments in design and competitive performance. *Proceedings of the 20th International Product Development Management Conference* organized by EIASM, June 23-25, Paris

DeEP (2012) DeEP Framework Part B. DeEP: Design in European Policy. Unpublished internal document

DeEP Glossary 2013

Design Council (2005, 2007), Design in Britain 2004-2005

DesignDenmark 2007

Design for Growth & Prosperity (2012), p.15 Report and Recommendations of the European Design Leadership Board

DTI, 2003, Competing in the global economy: the innovation challenge, Department of Trade and Industry, UK

Dumas, A. and Whitfield, A. (1990) Why Design is Difficult to Manage. In Gorb, P. (ed.) *Design Management. Papers from the London Business School*. Architecture Design and Technology Press, London, pp. 24–37.

Dunn William N. (2004: 35), Public Policy Analysis
Eden Partners (2012) Designing Demand National evaluation 2007-2012

Eisenhardt and Martin, 2000, Dynamic capabilities: what are they?

European Commission (2003) commission recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. Official Journal of the European Union

European Commission (2006) Dissemination and exploitation of results of our programmes, Brussels

European Commission (2008, 2009), *Design as a driver of user-centred innovation*.

Evans R.E. (2004), "An exploratory study of performance measurement systems and relationship with performance results", journal of operations management

Finnish Government, ‘Design 2005!, (2000) Decision-in-principle on the design policy of Finland

FORA (Rosted, J., Lau, T., Hogenhaveu, C., Johansen, P.) (2007) Concept Design. How to solve complex challenges of our time

French Ministry of Economy, Finance and Industry 2002

Gabrielsen G, Gronhaug K, Kahle L, Kristensen T, Plenborg T and Wilke R (2007), Is Good Design Good Business? In *Industrial Design, Competition and Globalization*: Palgrave Macmillan

Gemser G and Leenders M. (2001), How integrating industrial design in the product development process impacts on company performance. *Journal of Product Innovation Management*, Vol. 18, Pp.28-38

Gemser G Candi M and van den Ende J. (2011), How Design Can Improve Firm Performance. *Design Management Review*, Vol. 22, No. 2, Pp. 72-77

Gerston, L. (2004) Public Policy Making: Process and Principles. M.E.Sharpe Inc. New York

Godber (2008) The Designing Demand Review

Godin, B. (2005) The Linear Model of Innovation: The Historical Construction of an Analytical Framework

Griffin, A. and A. L. Page (1996), "PDMA Success Measurement Project: Recommended Measures for Product Development Success and Failure." Journal of Product Innovation Management (13): 478-496

Green Book on Creative Industries, European Union, 2010

Grünfeld L. A, Jakobsen E. W, Kaloudis A, Skogli E, Olsen D. S. (2011), Key innovation indicators, learning from principles and practice applied by professional industrial players and investors: Nordic Innovation publication

Hamel and Prahalad, 1996, Competing for the Future

Hayes, M.T. (2001) The Limits of Policy Change: Incrementalism, Worldview, and the Rule of Law. Georgetown University Press. Washington, DC

Hayes, W. (2009) The Public Policy Cycle Web Site

Hertenstein JH and Platt MB. (1997), Developing a Strategic Design Culture. *Design Management Journal (Former Series)*, Vol. 8, No. 2, Pp. 10-19

Hertenstein JN, Platt MB and Brown DR (2001), Valuing Design: Enhancing Corporate Performance through Design Effectiveness. *Design Management Journal*, Vol. 12 (Summer), No. 3, Pp. 10-19

Hertenstein JH, Platt MB, Veryzer RW. (2005), The Impact of Industrial Design Effectiveness on Corporate Financial Performance. *Journal of Product Innovation Management*, Vol. 22, Pp. 3-21

Hezri, A.A. (2003), Sustainability Indicators and Policy Processes: Experience from Malaysia. International Conference on Sustainabiity Indicators, Valetta, Malta. 6-9 November

Hill M. & Hupe P. (2002) Implementing Public Policy: Governance in Theory and in Practice. Sage Publishing Ltd

Hobday, M., Boddington, A. & Grantham, A. (2012) Policies for design and policies for innovation: contrasting perspectives and remaining challenges. Technovation, 32 (5). pp. 272-281

Inns T (2002), *The Tangible and Intangible Impact of Design Activity*. Dundee: Duncan of Jordanstone College of Art & Design, 2002

Irish Centre for Design Innovation 2007

Ittner C. D., Larcker F. D. (2001), "Assessing empirical research in managerial accounting: a value-based management perspective", Journal of accounting and economics

James Moultrie and Finbarr Livesey (2009) International design scoreboard, Initial indicators of international design capabilities

Jevnaker, B.H. (1998) Building Up Organizational Capabilities in Design. In Bruce, M. and Jevnaker, B.H. (eds.) Management of Design Alliances: Sustaining Competitive Advantage. JohnWiley & Sons, Chichester

Jiménez-Beltrán D. (2000) Are we moving in the right direction?, Transport and Environment Reporting Mechanism, TERM 2000, EEA, Copenhagen

Johansson, U. (2006), Design som utvecklingskraft. En utvärdering av regeringens designsatsning 2003-2005. Göteborg

Julie H. Hertenstein, Marjorie B. Platt and Robert W. Veryzer, (2005) "The Impact of Industrial Design Effectiveness on Corporate Financial Performance," Journal of Product Innovation Management 22: pp. 3-21.

Kaplan R. S, Norton D. P (1992), "The balanced scorecard-measures that drive performance", Harvard Business Review

Kaplan R. S, Norton D. P (1993), "Using the balanced scorecard as a strategic management system", Harvard Business Review

Karlsson H. (2013) Literature review: innovation evaluation document, DeEP Project

KEA (European Affairs) report on The Economy of Culture in Europe 2006

Kline, J., Rosenberg, N. (1986) An Overview of Innovation, in Landau, R., Rosenberg, N., *The Positive Sum Strategies: Harnessing Technology for Economic Growth*, Washington DC

Knill C. & Tosun J. (2008), Policy Making. Working Paper 01/2008. Chair of Comparative Public Policy and Administration, Department of Politics and Management. University of Konstanz. Konstanz, Germany

Kolmodin, A. and A. Pelli (2005). Design for Innovation and Growth – a promising competitive concept in the future?

Kotler, P. and Rath, G.A. (1984) Design: A Powerful but Neglected Strategic Tool. Journal of Business Strategy

Langdon Morris, (2011) The innovation master plan.

Lipsky (1971, 1980) Street-Level Bureaucrats and Institutional Innovation: Implementing Special-Education Reform

Livesey F, Minshall T, Moultrie J (2006), *Investigating the technology based innovation gap for the United Kingdom*, Report for the UK Design Council, University of Cambridge, Institute for Manufacturing

Lockwood T. (2004), Integrating design into organizational culture. *Design Management Review*, Vol. 15, No. 2, Pp. 32-39

Marshall R. (2007), "The contribution of earned value management to project success of contracted efforts", Journal of contract management

Martin RL. (2009) *Design of Business: Why Design Thinking Is the Next Competitive Advantage*. Cambridge, MA: Harvard Business Press, 2009

Mayntz R. (1977). Die Implementation politischer Programme. Theoretische Überlegungen zu einem neuen Forschungsgebiet.

Mazmanian and Sabatier (1983) Implementation and public policy

Ministry of Industry Employment and Communications, (2004), Innovative Sweden: a strategy for growth through renewal, The Ministry of Industry, Employment and Communications and Ministry of Education

Moultrie, P.J.C., and David, P. (2007) "Development of a Design Audit Tool for SMEs." J Prod Innov Manag 2007; 24:335-368

Moultrie J., Livesey M. (2009) *International Design Scoreboard: Initial indicators of international design capabilities*. Cambridge: Institute for Manufacturing

Nesta (2008) Beyond the creative industries: making policy for the creative economy, Policy briefing

Nesta (2009), The Innovation Index Measuring the UK's investment in innovation and its effects, London

New Zealand Design Taskforce (2003)

Newton K. and J.W. van Deth (2005). Foundations of Comparative Politics. Cambridge: Cambridge University Press.Norman

Nilsson, F., B. Regnell, et al. (2010), "Measuring for innovation - a guide for innovative teams." Applied Innovation Management (2)

Nordic Innovation Centre 2006

OECD frascati manual

OECD (1998), Towards Sustainable Development - Environmental Indicators, Paris

OECD, (2002) Glossary of Key Terms in Evaluation and Results-Based Management 2002. Organisation for Economic Cooperation & Development/Development Assistance Committee

OECD-EU (2005) "Oslo Manual - Guidelines for Collecting and Interpreting Innovation Data"

OECD (2008) "Handbook on constructing composite indicators, methodology and user guide"

OECD, (2010) The Economic and Social Role of Internet Intermediaries. Organisation for Economic Cooperation & Development/Development Assistance Committee. April 2010

OECD (2013) Workshop on measuring design and its role in innovation - Background Document

Olsson, A., Ed. (2008). PIEp, Product Innovation Engineering program. Malmö, Holmbergs i MalmöAB

Perks, H., Cooper, R. and Jones, C. (2005) Characterizing the Role of Design in the New Product Development: An Empirically Derived Taxonomy. Journal of Product Innovation Management

Polish Ministry of Economy 2007. The report refers to the definition of ICSID

Pressman J. and Wildavsky A. (1973) Implementation: How Great Expectations in Washington Are Dashed in Oakland; Berkeley: University of California Press

Pülzl, H. and Treib, O. (2006) 'Policy Implementation'. In Fischer, F., Miller, G. J. and Sidney, M. S. (eds.) *Handbook of Public Policy Analysis: Theory, Politics, and Methods* (Boca Raton: CRC Press), pp. 89-107.

Ravasi D and Lojacono G (2005), Managing Design and Designers for Strategic Renewal. *Long Range Planning*, Vol. 38, No. 1, Pp. 51-77

Ravasi D and Stigliani I (2012), Product Design: A Review and Research Agenda for Management Studies. *International Journal of Management Reviews*

Rich H (2004). Proving the Practical Power of Design. *Design Management Review*, Vol. 15, No. 4, Pp. 29-34

Roy R. (1994), Can the Benefits of Good Design Be Quantified? *Design Management Journal*, Vol. 5, No. 2, Pp. 9-17

Roy R. (1997) Design for environment in practice – development of the Hoover New Wave washing machine range, Journal of Sustainable Product Design, Issue 1, April, pp. 36-43

Roy R. and Riedel J. (1997) Design and innovation in successful product competition, Technovation, Vol.17 No. 10, pp. 537-548

Rutman (1980) "Planning useful evaluation: evaluability assessment"

Sawang S. (2009) Key performance indicators for innovation implementation: perception vs actual usage: School of management, QUT Australia

Scott, Z. and Mcloughlin, C. (2012) Topic Guide on Political Systems. Governance and Social Development Resource Centre

SEC, 2009, Final commission staff working document: Design as a driver of user-centred innovation Brussels

SEE Platform (2012) Policy Innovation Design

Shepsle K. A. and Weingast B. R. (1987) The Institutional Foundations of Committee Power. The American Political Science Review, 81:1 (Mar., 1987), pp. 85-104. Published by: American Political Science Association

Sida (2007) Glossary of Key Terms in Evaluation and Results Based Management, Swedish International Development Cooperation Agency, Stockholm

Smith, T. (1989) Policy evaluation in third world countries: some issues and problems. The Asian Journal of Public Administration

Swan KS., Kotabe M and Allred BB (2005), Exploring robust design capabilities: Their role in creating global products, and their relationship to firm performance. *Journal of Product Innovation Management*, Vol. 22, No. 2, Pp. 144-164

Swedish Industrial Design Foundation, Swedish Agency for Economic and Regional Growth Stockholm: 2004

Talke K, Salomo S, Wieringa JE and Lutz A. (2009), *What about Design Newness? Investigating the Relevance of a Neglected Dimension of Product Innovativeness. Journal of Product Innovation Management, Vol. 26,* Pp. 601-615

TBS (Treasury Board Secretariat) (2004) Policy Statement: Amended Terms and Definitions

Teece and Pisano (1994); The Dynamic Capabilities of Firms

Teece et al, (1997,1998), Dynamic capabilities and strategic management; Institute of Management, Innovation and Organization, Haas School of Business, University of California, Berkeley, CA 94720-1930, U.S.A

Teece, D.J. (2011), Dynamic Capabilities & strategic management. New York, USA, Oxford University Press Inc

Tether in SEEdesign Bulletin: Sharing experience on design support (2006)

Theodoulou, Stella Z, & Kofinis, C. (2004), The Art of the Game: Understanding American Public Policy Making. Belmont, CA: Wadsworth

Tidd, J. and J. Bessant (2009), Managing Innovation. West Sussex, England, John Wiley & Sons Ltd

Trueman M and Jobber D. (1998), Competing through Design. *Long Range Planning*, Vol. 31, No. 4, Pp. 594-605

UK Department of Industry and Trade (DTI) (2005)

UK Government 'Creative Britain. New Talents for the New Economy', 2008

Utterback J. (2008) Design-Inspired Innovations

Van de Graaf and Hoppe (1996). Beleid en politiek : een inleiding tot de beleidswetenschap en de beleidskunde Coutinho, Bussum

Vedung, E. (2000), "Public Policy and Program Evaluation"

Verganti R. (2009), *Design-Driven Innovation. Changing the Rules of Competition by Radically Innovating What Things Mean*. Harvard Business Press, Boston

Veryzer R.W. (2005), The Roles of Marketing and Industrial Design in Discontinuous New Product Development. *Journal of Product Innovation Management*, Vol. 22, No. 1, Pp. 22–41

Wallace R. (2001), Proving Our Value: Measuring Package Design's Return on Investment. *Design Management Review*, 12, vol. 3

Waller, P., Morris, R.M., and Simpson, D. (2011) Understanding the Formulation and Development of Government Policy in the context of FOI. UCL , The Constitution Unit

Walsh V, Roy R, Bruce M and Potter S. (1992), *Winning by Design: Technology, Product Design and International Competitiveness*: Blackwell Publishers Webster's New World College Dictionary, Wiley Publishing, Inc., Cleveland, Ohio

Webster's New World College Dictionary, 2010

Wholey J.S., Harry P.H., Kathryn E.N., (1994), "Handbook of practical program evaluation"

Windhoff-Héritier (1980) *Windhoff-Héritier, Adrienne* 1980: Politikimplementation: Ziel und Wirklichkeit politischer Entscheidungen, Königstein/Taunus.

World Design Survey, (2011) Document available at http://worlddesignsurvey.org/

Zahra, S.A. and George, G. (2002) "Absorptive Capacity: A Review, Reconceptualization and Extension", Academy of Management Review

Zec and Jacob B. (2010), *Design Value*: Red Dot Edition