

# POLITECNICO DI TORINO

Department of Management and Production (DIGEP)

Master Degree Thesis

## **PLATFORM DESIGN FOR SERVICES** **The use of design platforms in Service Design**



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Firmate dove volete.





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*A me, il mio più grande progetto*

# **Abstract**

This thesis is about the development of a service platform for a social cooperative based in Turin. The project stemmed from a consultancy contract between the social cooperative Stranaidea s.c.s. and the Department of Production Engineering and Management of Politecnico di Torino (DIGEP). The principal investigator has been Francesca Montagna, Associate Professor of Innovation Management and Product Development at the DIGEP, who has worked together with Master student and author of this thesis Giovanni Marco Losi. Creating a platform proved to be pivotal both to address innovative approaches to service design to be integrated in the cooperative's established practices and to foster changes in the management and organizational structure of the cooperative. Starting from a general request of flexibility coming from Stranaidea's management, the work has been divided in two main parts. The first part was a research one, presented in Sections 1 and 2, in which the concept of third sector has been clarified and product and service design methods have been reviewed in order to select the ones that appeared most consistent with the work that had to be done. The first area that has been treated is about the intrinsic characteristics of services, starting from the concept of service itself. Then, the applicability to services of concepts such as product architecture and modularity has been studied in order to verify whether the request for flexibility expressed by management could be addressed with methods adopted in product-oriented environments. The study indicated that the

platform is a preferential method to ensure flexibility also in a service oriented context, confirming what was taught during the first meeting with Stranaidea's management. The second part of the work, presented in Section 3, consisted in the application of such method to the specific case of Stranaidea. At first, the information needed to carry out a rigorous analysis was gathered through interviews with service managers, in order to preserve the human factor fundamental to the cooperative. Then, the information was analysed with powerful tools such as sector matrices, modularization function and adjacency matrices. Once the final results were obtained, an additional step was taken in order to introduce to the whole cooperative how the platform could impact on the organizational structure.

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# Introduction

The demand for goods or services that have a social impact has been radically changing especially for the last three decades: to invest in these enterprises is becoming of great importance in order to sustain growth and innovation in Italy.

According to a census of the third sector, between 2011 and 2017 Italian social enterprises have witnessed an average annual growth of 3%, higher with respect to market oriented firms. This growth trend, that concerns both revenues and employment has been constant since the beginning of the century.

Third sector enterprises (social enterprises in particular, thanks to the mission they carry out), discussed more in depth in the following section, have often shown an anti cyclical economic performance, especially during the economic crisis. However, accordingly to a completely new perspective these entities are beginning to represent an enterprise model able to respond to contexts of crisis and, with the Third Sector reform, to step up as an interesting and constructive solution not only for social benefit, but also for innovation.

Even though these entities thrived on a demand mediated by the public sector the great organizational resilience and the strong attachment to their social mission makes social cooperatives an attractive investment alternative. Moreover, policy changes and funding mechanisms that derived from these entities bring new challenges to these organizations that have to get closer to the private enterprise model.

The question arises: can one apply the same methods and models conventionally used in the private sector in a social context? That is, can one transfer the knowledge and the practices stemming from conventional entrepreneurship and innovation

management into ventures that express an explicit social aim? The theories and the work discussed in this thesis give a possible answer to this question.

During the development of this thesis work methods and tools coming from traditional innovation management and product development theories have been applied to a service oriented enterprise belonging to the third sector. The work derived from a consultancy contract signed between Stranaidea s.c.s., a social cooperative based in Turin, and the Department of Management Engineering and Production of Politecnico di Torino (DIGEP), whose principal investigator has been Associate Professor Francesca Montagna. The activity was carried out together with MS student and author of this thesis Giovanni Marco Losi in the period going from October to December 2019. According to the requests by the cooperative's management, we have taken into account multidisciplinary aspects that fostered creativity and allowed us to obtain a result that fitted such a complex context, strongly characterized by the human factor. The socio-economic context in which social cooperatives find themselves nowadays requires these entities to be more prepared to a new competitive scenario: the future sees social enterprises gaining more and more access to risk capital. It means that social enterprises have to be prepared to show how well they work, which they have not been doing in a rigorous way since they have always addressed non-reimbursable funds. Showing how well a job is done means creating reliable indicators (for example, the widespread social impact one) and to do so the so called human factor has to be balanced with rigorous methods and tools coming from engineering and for-profit sector. Then, the aim of the consultancy work carried out in Stranaidea has been to start up an innovation process that could introduce the cooperative to new tools and methods, in order to pave the way to possible changes.

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Compagnia di San Paolo is actively involved in the territory of Turin and Piedmont for what concerns social innovation. Among its initiatives in support of entities related to the third sector particular relevance is given to the Social Enterprises Efficiency & Development (SEED) call to tender. The SEED competition addresses social enterprises which Compagnia di San Paolo wants to promote for the value they create in the communities they operate in and the employment opportunities they offer, creating beneficial outcomes for the local economy as a whole. They are seen as social innovators since they are not only as problem solvers but also as problem setters, since they are able to read and anticipate social needs and their changes and to modify the provision of services in order to satisfy them, by creating new social relations and collaborations. Moreover, they are an economic model, since they put together measurable social impact and economic value generation, and they need help in maintaining and evolving both their social mission and their entrepreneurial inclination. In the recent past several opportunities have been put in place for start-ups having a social mission; Compagnia di San Paolo decided to give access to similar opportunities to social cooperatives that are in a different phase of their life cycle. SEED call to tender has the goal of promoting and supporting social cooperatives that want to improve their entrepreneurship ability, their efficiency, profitability and good governance to reach a condition in which they could face the due diligence carried out by a private investor (investment readiness). Compagnia di San Paolo gave social cooperatives the opportunity to analyze their organizational structure with the help of professionals, chosen by the cooperatives themselves in compliance with rules set by Compagnia di San Paolo, and to shape their future. It has to be said that the adequacy to attract third party investments (investment readiness) is still an ideal perspective not yet linked to a real financing opportunity. There exists, though, a potential capital offering for social enterprises, even if it is necessary to verify if it satisfies third sector necessities. The SEED call to tender wanted to intercept the possible financing demand coming from social coops and to help them being ready when the hypotheses of third party investments will become

a solid reality.

The participating cooperatives had to undergo two distinct phases:

1. In - depth study of the cooperative and strategic - organizational checkup;
2. Strategic - organizational and/or innovation plan implementation.

Our work took place in the second phase.

Among the 20 winners of the SEED call to tender there was Stranaidea s.c.s., a Turin based social cooperative active in different fields. Stranaidea was awarded 25,000 to be spent to implement its strategic and/or innovation plan; the plan, made public as per the call to tender, states that the cooperative wants to adapt its organizational structure in order to:

- be able to activate new welfare services for privates;
- improve its ability to understand the needs of its territory;
- enhance bottom-up knowledge.

More specifically, Stranaidea started a transformation process stemmed from the introduction of a new service for privates, that addresses a previously unexplored market for the cooperative. During the first phase of the SEED competition (in which 40 initial winners were awarded with 5,000 ) this new service was analyzed together with a group of experts , which helped to define its business model. One of the main focus points has been on how this new service could be integrated in the pre-existent core activities of Stranaidea, evaluating its positioning among the values that characterise the cooperative. The strategic check-up lasted from January to March 2019; during this period the new service was co-designed by the management of the cooperative, the employees in charge of the service and the aforementioned group of experts. One output of the first phase was a strategic-organizational plan, with the goals to be reached in medium-long term, and the resources and the steps needed to make it realized. For the implementation of its strategic plan, Stranaidea

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exploited the opportunity of using the money coming from the call to tender to get the help of external consultants and started the already mentioned collaboration with Francesca Montagna, Associate Professor at Politecnico di Torino.

# Section 1

## Breaking down the Third Sector

### Summary

The first section of this thesis is aimed at giving the clearest possible framework in which the consultancy and research project has taken place. The concepts presented in the section are seamlessly narrowed down in order to provide a clear identikit about the entity in which the project has been carried out. The starting point is the definition of the third sector, that, albeit very general, is necessary to clearly address which are the reasons behind the fact that third sector enterprises express entrepreneurial and innovative needs.

# 1.1 Defining the Third Sector: let's start with why

Since the second half of the last century many scholars have been wondering about the so called Third Sector, a concept among the most perplexing ones in modern economics and social studies.

But, why is that?

Economic theory, as we know, is built on the existence of three major players that occupy the social space, which are the market, the state and the household. During the XX century, a new set of social entities (institutions and individual activities) has emerged highlighting that the aforementioned social space is way larger than how it had been described. These entities cannot be inserted in any of the previously stated economic players, since they share a set of attributes that set them apart. First of all, they are private: hence, they cannot be inserted in the State. Secondly, their goal is to pursue a common good, which sets them aside of market entities. Finally, unlike households (that is, families) active participation in them is due to free choice. This initial distinction, though, does not allow one to actually identify which actors are part of the third sector: sticking to the general definition of NPO (Non Profit Organizations) seems reductive, and, on the other hand, ignoring their similarities with non profit institutions would be counterproductive. Recent studies, such as the ones carried out by Salamon and Sokolowski (2016), have focused on the definition of boundaries that could allow to better define this blurred zone in the social space in order to foster its institutionalization [1]. A second conceptualization can be drawn from the work of Defourny and Borzaga (2001), according to which the legal structures that are part of the Third Sector represent

“the new or renewed expression of civil society against a background of economic crisis, the weakening of social bonds and difficulties of the Welfare State” [2]

## **1.1 Defining the Third Sector: let's start with why**

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The peculiarity of the entities that populate this sector lies in the fact that they show features generally attributed to private enterprises, such as flexibility, rapidity, and creativity paired with the pursuit of the social benefit. These private - like characteristics bring an added value to the services generally provided by the State or other public agents since they constitute the qualities behind the improvements of every private enterprise.

### **1.1.1 The birth of the Third Sector**

The idea of a distinct economic sector in the social space emerged during the first financial crisis after World War II, that is, during the mid 70s. This crisis highlighted all the limitations of both the private and the public sector, raising the awareness around other types of economic organizations that could overcome both the faults of capitalism and state socialism. This global trend found a very diverse and mobile environment in Europe, where different circumstances among the different nations have not fostered the spread of this concept as steadily as in the United States. This said, though, other important factors enabled European countries in adopting these new forms of economic organization: first of all, tradition. In Europe mutual organizations and co - operatives go way back to more than a century before the mid 70s and together with self - help movements and other association - based economic initiatives they were already an important player of the social landscape, even though in a non - formal or non - institutionalized fashion.

### **1.1.2 Theoretical approaches to the Third Sector: towards a complete definition**

Once the awareness around the third sector had spread internationally two main theoretical approaches have consolidated: the “non - profit” approach, which saw no marked distinction between the NPOs and the entities of the Third Sector and the “social economy” approach which brought together legal structures such as co-



## 1.1 Defining the Third Sector: let's start with why

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operatives, mutual societies and associations. The former gained importance mainly in the United States, thanks to the relative ease of defining tax laws specifically for the NPOs, which had clear characteristics and boundaries. The latter approach, instead, spread from France and was then acquired by the European Union, since it included, albeit still in a potential way, all the different forms of legal structures that could differ from the State and the private market entities.

Later on other theories have been developing around the globe. Above all, the tri - polar approach, according to which the Third Sector is localized “mid - way” among the three types of agents described by the economic theory and mentioned in the first paragraph (that is, State, private enterprises and households) or among the types of resources involved (commercial, non commercial and non monetary). Such an approach can easily bring together the first two, smoothing their divergences. Activities that concern with the third sector are widely associated with the economic roles of the State:

- Provision of quasi - public services;
- Wealth redistribution to the underprivileged;
- Integration or reintegration of the under-qualified citizens in the labour market.

What's relevant about this is that these public - like activities are driven by new kind of entrepreneurship aimed at social goals. The latter characterizes, among the entities that constitute the Third Sector, the so called social enterprises, which will be the discussion focus in the following. What is clear, at this point, is that the third sector presents itself as a set of entities with flexible characteristics: as it will be shown in the rest of this thesis flexibility is the main feature of such an economic agent and the reason behind its steady growth in the past decades.

## 1.1 Defining the Third Sector: let's start with why

### 1.1.2.1 Representing the third sector

A rough conceptualization of the third sector has been given by Salamon and Sokolowski (2016) [1]. As shown in figure 1.1, the Third Sector includes a relatively wide cluster of entities: NPIs, Cooperative and Mutuals, Social Enterprises and other human activities that are carried out without pay. The peculiarity of this representation lays in the fact that this sector, besides being a whole new player in the social space, overlaps with other institutional sectors. The distinction of what stays within the frontier and what remains outside is given by the three features already mentioned above, that are privateness, public purpose and non - compulsory participation. Among these, the public purpose feature can be identified as the absence of profit distribution to stakeholders. Finally, the distinction between the NPIs and the other types of activities is not marked by a continuous line since, some of these are also non - profit organizations, as is the case of Stranaidea.

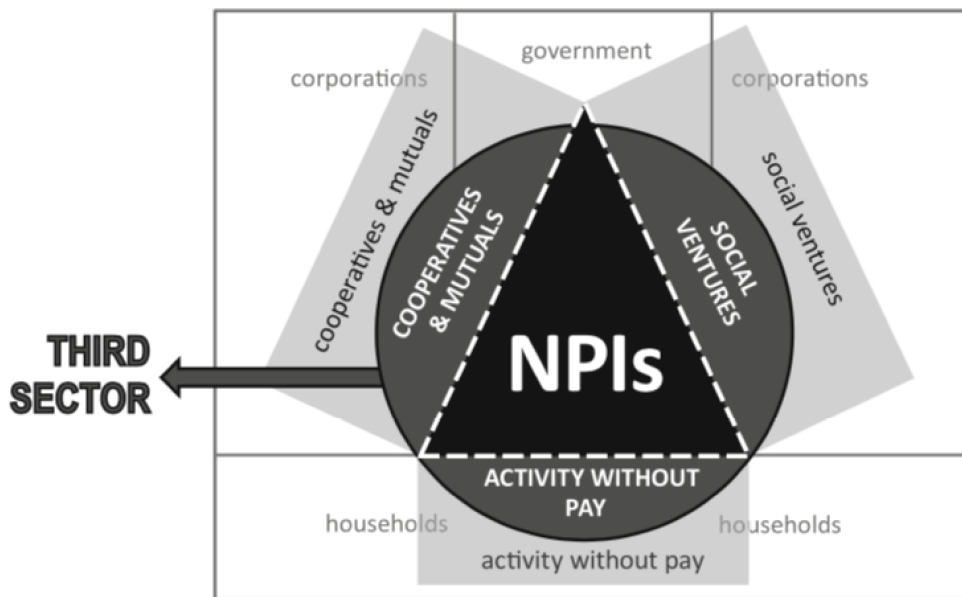


Figure 1.1: Rough conceptualization of the third sector [1]

## 1.2 The Social Enterprise

Among the entities introduced by far the interest of this thesis is focused on the concept of social enterprise. This is due to the fact that this type of activity shows marked entrepreneurial dynamics[7] compared with the ones showed in figure 1.1. Entrepreneurial dynamics are fostered, as already said, by a challenging economic environment, in which difficulties move private action to compensate the deficiencies of the public authority. The response to these challenges, driven mainly by social enterprises (but concerning the third sector as a whole), caused a shift from a welfare state to a welfare mix [2] where the aim of providing efficient services to the citizens is not the State's prerogative any more but is shared with for - profit entities and third sector organizations, under strict fairness criteria.

### 1.2.1 Enterprise to innovate

What is entrepreneurship? In Schumpeter's words it is what entrepreneurs do in order to innovate, that is, "carry out new combinations in the production process" [8] and, thereby, foster economic development. How? In one of the following ways:

- Introducing new product or a new quality of products: this is exactly what the third sector, especially in the form of social enterprises, did in lieu of the public authorities when the supply of welfare services by the State showed marked deficits;
- Introducing new methods of organizations and/or production: players in the third sector proved to be pioneers in this field, since a massive slice of their growth is due the multi - stakeholder structure that they have adopted internationally;
- Introducing new production factors: again, this happened in the third sector entities, since they all have the peculiarity to exploit the work of volunteers,

who allowed the provision of services that were either unavailable or impossible to obtain from paid workers. Moreover, also paid work dynamics were heavily innovated in this sector, since many organizations have promoted new types of employment such as semi - voluntary formulas or by enhancing the role of the worker inside the organization by recognizing him or her as members of the governing bodies of the social enterprise. Finally, mixing paid workers and volunteers meant introducing a highly innovative form of production factor.

- Introducing new market relations: if, on the one hand, provision of public services had always been responsibility of the State, on the other hand the intention to provide better suited and less expensive ones to citizens induced public authorities to make an extensive use of calls to tender bringing different types of service providers into competition to secure public funding linked to the accomplishment of specific requirements. This type of new market relation (a quasi - market), driven by third sector entities, marked the change of direction from tutelary control to competitive control from the State. And competitiveness, we know, calls for entrepreneurship and innovation.

What has to be remarked is the entrepreneurial character of these organizations, since this brings them closer to traditional for - profit enterprises, since they act in a competitive environment, depending on the changes of their commercial sector they have to re - model their governance and management structures. Moreover, they bear economic risk since their survival and competitive advantage depend of their ability to win the aforementioned quasi - markets.

### 1.2.2 Capturing the “social” dimension

Up until now we have been talking about economic trends referred to social enterprises, without wondering whether these trends can match with their social dimension. In other words, can an organization that shows the features mentioned in the previous paragraph (such as the burden of economic risk or the participation in

competitive markets) have a social aim? Although being neglected by different authors, which identify the social aim with the non - profit distribution constraint and point out that in reality these enterprises are only pursuing a double bottom - line strategy [9], this is possible by relying on the two theoretical approaches stated in paragraph 1.1 and combining them with the innovating economic practices already mentioned. The social dimension comes from three distinct aspects [2]. First of all the aim of producing goods or providing services to sustain the community instead of generating profit, which is different from the general statement of the non - profit sector of non distribution of surplus to members or managers. Social enterprises operate, in fact, under the requirement of *socializing* the production surplus. Secondly, social enterprises finance their activities both with resources retrieved from the market and with non - commercial resources provided by the public authorities. Finally, decision making in these organizations follows a democratic process.

### 1.2.3 The basis for a theory of social enterprise

Even though the approaches and the theories presented by far allow to better frame the concept of social enterprise, EMES research center and EURICSE (European Research Institute on Cooperative and Social Enterprise) still work on better defining it, which boundaries have been further narrowed down by taking the concept of cooperative from the social economy approach and pairing it with the non - profit approach (as stated before). The result can be seen in figure 1.2, which represents a basis for further developments of a theory of social enterprise. This has not to be interpreted as if all social enterprises are both cooperatives and NPOs (which is true in the majority but not the totality of cases) but as a feature of social enterprise that reflects aspects of both these types of organizations, which, in turn, further highlights the innovative driver that characterizes these entities. As shown in 1.2 among social enterprises there is one category that has been highlighted: the social cooperatives. Social cooperatives represent the main point of interest of this thesis, besides being a peculiar case of third sector development in Italy.

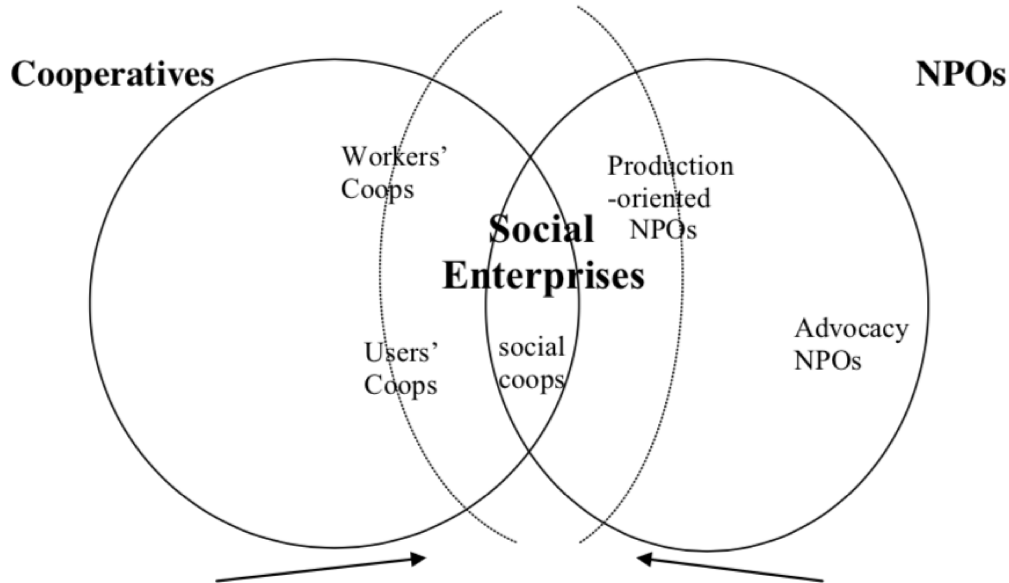


Figure 1.2: Intersecting the cooperative and non - profit sector [2]

### 1.2.4 Role, weaknesses and perspectives of the social enterprises

It has been said, in synthesis, that social enterprises have the merit of mobilising resources that would otherwise be impossible to reach for other players in the social space. Albeit being very innovative, especially for this reason, it is easy to think that they might bring underlying weaknesses concerning their financial resources and their organizational efficiency [2]. In other words can they cover a long term role or their participation in the social space can only be episodic? Taking this question to an extreme one could argue that the improvement they want to cause, that is increasing the financial resources of the private individuals addressed by their services, could become the cause of their extinction, since their same beneficiaries would then attract private sector firms thanks to their increased purchasing power. Moreover, it has been pointed out that social enterprises (especially social cooperatives) might depend too much on public funding, since their major source of financing comes from

### **1.3 The Italian case: birth and development of social cooperatives**

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calls for tender issued by public authorities. The Italian case of social cooperatives, as will be presented in the following, answers to these interrogatives and refutes the theories which see social enterprise doomed and inevitably linked to the financial fate of the State.

### **1.3 The Italian case: birth and development of social cooperatives**

Among social enterprises, social cooperatives are the most common in Italy. This is mainly due to the fact that Italy presented the right circumstances, alongside with the European tradition of cooperative work, that made social coops the driver of the third sector in the country. If one wants to see social coops just as one category of social enterprise then one could describe these entities as merely “productive organizations created and managed to supply services to local communities [...] rather than to distribute value exclusively or primarily to their owners” [9]: the consequence of such a statement implies that these organizations exist because of contracting out policies and depend on them. That is, social cooperatives are here only because States are less vertically integrated. This hypotheses strongly ignores the values behind collective action that permeate this reality and the fact that they represent the ability of citizens to foster institutional changes. And ignoring such aspects means completely overlooking the often underestimated contribution these enterprises gave to social innovation. To clearly understand the reasons behind the emergence and the success of social cooperatives Borzaga and Galera (2016) proposed a bottom - up approach, which partially neglects the existence of these institutions as a mere consequence of public authorities’ vertical integration decisions [9]. In 1991, Perlmutter wrote that the Italian scenario did not present itself as suited for non - profit organizations to play a significant role, since up until the eighties the non - profit sector was nearly absent in Italy. As history unfolded, Perlmutter has been proven wrong. But, why? First of all, the weak presence of NPOs on the Italian territory,

### **1.3 The Italian case: birth and development of social cooperatives**

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as opposed, for example, to the already strong theory around NPOs in the US, might have actually been an activating factor for such and hybrid reality to rise and develop in this country. Secondly, social enterprises in Italy were born in the form of cooperatives since the beginning, leaving them in a twilight zone were no precise definition to these entities. What was new, of course, was that they were not focused on the interests of their members but on the ones of people in need who had been ignored by public policies. The willingness of Italian volunteer group to respond to a growing demand for social services since the mid seventies represents a first proof of the importance of the social dimension and impact of social cooperatives.

Moreover, theories as the one of Perlmutter, neglected important factors such as the historical tradition of civic commitment on the Italian territory since the pre - war period. In addition to this, the exponential post - war economic growth experience by Italy after World War II was not paired with high social mobility and, consequently the welfare system did not develop accordingly to the demand for social services. Speaking of low social mobility means referring, for example, to the loophole situation in which women found themselves until the early seventies: the general opinion was that basic social services were to be provided by households, which precluded women from accessing the labour market. And with a few women in the labour market this opinion found itself reinforced. It was through workers' and students' dissatisfaction and protests in the late sixties that this downward spiral was stopped and households moved from the supply side of services to the demand side, a demand that could not be addressed by the existing welfare system. This factor, together with other conventional ones such as the youth unemployment rate and recession activated the change in the social space as described in the previous paragraphs. What struck Italian public authorities the most was the diversification of needs that required innovative approaches: at that time the welfare system strongly relied on cash benefits (how to forget baby - pensions) and since families were thought to self - fulfill their social needs, the system was prepared (poorly) to supply services that responded to emergencies that families were unable to deal



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with.

In the process of narrowing down the concept of third sector to the one of social cooperative some key features have been highlighted that explain why such context has been proving itself to be capable of accepting inputs that come from Management Engineering and Innovation Management. The features highlighted by far give a sense of the fertile ground that social enterprises represent for innovative and entrepreneurial dynamics that have been extensively applied to for - profit firms.

#### **1.3.1 Social Cooperatives: bringing complexity in the legal landscape ...**

The role of cooperatives is well stated in article 45 of the Italian Constitution according to which they are subject to a strong, even if no full, profit distribution constraint: hence, they are treated as non - profit organizations. This said, though, they were nonetheless focused on supporting members' interest, so their use by volunteers for improving the welfare system addressing the demand of people in need represented quite a difficult situation, legally speaking, to deal with. Up until 1991, when what were called social solidarity cooperatives obtained legal acknowledgement with the Act on Social Cooperatives (no. 381). Peculiarity of this law, and great innovating characteristic of social cooperatives (as aforementioned), was the possibility for these organizations to comprehend different types of members in the ownership structure (workers, users, volunteers, financing members, legal entities). Moreover this law definitely stated that these cooperatives must agree to a non - profit distribution constraint and that their assets are indivisible. An immediate effect of this law was the definitive separation of voluntary advocacy organizations reliant on donations and social cooperatives, which were given the rightful title of service providers capable to compete in a market thanks to public contracts and paid workers. In a few words, law 381 configured the social cooperatives merging two previously distinct features in a unique structure [3]: oriented to the public

### **1.3 The Italian case: birth and development of social cooperatives**

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benefit in terms of the services supplied and, at the meantime, privately oriented with regard to organizational, managerial and accounting aspects.

#### **1.3.2 ... and dealing with complexity in the social landscape.**

As it was said before, what struck the Italian public authorities was how the demand for social services has constantly been diversifying since its emergence. Social cooperatives promptly proved to be able to deal with such a plurality of needs thanks to the flexibility that is granted them by all the features discussed above (i.e. their multi - stakeholder structure). A continuously diversifying demand can be only met by a continuously ready and diversifying supplier and a supplier that is able to do so is able to innovate. Again, we see how innovation is embedded in social cooperatives. In dealing with diversity and competition (that is, bearing economic risk) both the "social" part and the "enterprise" part of such entities played an equal role: what made them thrive has been the ability of these players to pair the willingness of their founders, workers and volunteers to help and the instruments, strategies and theories deriving from the business world. Figure 1.3 shows how social cooperatives were able to work for a common good and succeeding in doing so thanks to the application of criteria of economic rationality and efficiency (in terms of use of available resources).

#### **1.3.3 Growing exponentially and overcoming challenges**

Since their legal recognition in 1991 social cooperatives have witnessed an exponential growth in number (as shown in fig. 1.3.3), confirming the positive outcome that this type of enterprise has over the society and the economy.

### 1.3 The Italian case: birth and development of social cooperatives

Social success	Economic success	
	High	Low
High	Efficient and effective management, stakeholder satisfaction, and the pursuit of social goals are interrelated.	Social success is achieved to the detriment of economic equilibrium and is therefore destined not to last.
Low	Economic success is achieved at the expense of some stakeholders' expectations or one or more of the social goals.	Inefficient and ineffective management, stakeholder dissatisfaction, and failure to achieve one or more of the social goals.

Figure 1.3: The Business Idea of Social Cooperatives [3]

Year	Number	Index (1985 = 100)
1985	650	100
1990	1,800	277
1995	2,834	436
2000	5,401	831
2001	5,936	913
2003	7,400 (estimate)	(1,138)

As of 2004, though, there were only a few social cooperatives actually able to compete with ordinary for - profit firms. Before going on explaining why social cooperatives are always more and more in need of being able to compete and innovate there is one peculiar characteristic of these enterprises that is worth mentioning, resilience, of high relevance in terms of the strength and value that these entities continuously give proof of. From 2008 to 2013 the Italian economic cycle showed a significant drop with a 9 point GDP reduction and more - than - doubled unemployment rates. This implied severe budget constraint that were heavily felt at the local level, strongly affecting local administrations, which were the main supporters of the provision of social services. It goes by itself that the spending for these kind of services was abundantly reduced. In this framework theories according to which social cooperatives completely depended on public authorities were put to test. And

### **1.3 The Italian case: birth and development of social cooperatives**

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were proven inconsistent. Instead of being doomed as they appeared social cooperatives did not stop increasing in number and employees during the whole financial crisis. As reported by the Istat (National Institute of Statistics) research report on the structure and performance of Italian cooperatives (2015) both production levels, members' satisfaction and employment levels have been assured (and increased) even if this meant sacrificing the net operational result for the whole five years of the crisis. This ability of being resilient stood out in comparison with other types of organizations (such as for-profit enterprises), proving that the focus on the outcomes of cooperatives rather than on profits is not detrimental to these enterprises. By 2015 the number of social cooperatives increased by 13% during these five years, while other kinds of enterprises faced a decrease of 3.2 percentage points. To further refute the aforementioned dependency theories health and social assistance sectors (among the social cooperatives) registered a 31.6% increase in the value of production, even though being the sectors in which public funding is the highest. Not only the generated value increased, but also the investments made by social cooperatives, that during the financial crisis, invested a total of 7.7 billion euros. These data prove that the resilience of social cooperatives served as a mean to detain a high degree of autonomy in terms of organizational and management strategies [9]. In other terms, they have proven to be able to supply an increasing number of services not driven by or dependent on an increase in revenues and to use public financing only to strengthen their equity and foster their investments. Besides these aspects of resilience and autonomy social cooperatives have proven to be way more dynamic than the one predicted by scholars, going well beyond the "mutual accommodation" characteristic they are only in part based on. According to a research carried out by Unicredit Foundation in 2012 that focused on the economic value of the third sector the amount of public spending in these activities dropped significantly up until 2012, while the amount of private financing faced an increase for all the organizations involved in the third sector. It goes by itself that the ability to respond to a constantly diversification demand, the resilience and the flexibility shown by social cooperatives

## 1.4 Towards a social cooperative enterprise

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are all based on activities that have been financed more and more through sources different from public ones. What we are witnessing today is confirming this trend: the need of private investments is increasing and since the Reform on the third sector between 2017 and 2018 introduced measures for the funding of social cooperatives through risk capital the needs for entrepreneurial behaviours and innovation have been intensifying together with the social cooperatives' need of working according to specific requirements in order to have their performances measured in a way that could be clear and satisfactory for private investors. Moreover, these needs are all intensified by the fact that nowadays public authorities remain inefficient and their inefficiency is transferred to social cooperatives in the form of delayed payments and budget constraint that have been forcing these organizations to seek for alternative sourced of funding. One of the most widespread trends in this sense is the sale of services to private clients in order to attract revenues from private demand and reinforce the activities funded by the State or by local administrations. This, in turn, further increases the urge for social cooperatives to adopt techniques, strategies and business models from the traditional for - profit sector.

## 1.4 Towards a social cooperative enterprise

Social cooperatives find themselves in a very peculiar and advantageous position to adopt more enterprise - oriented strategies and the reason behind this is transparency. Even though Borzaga (1998) talks about a fiduciary factor that could foster opportunistic behaviour (as in [10], social cooperatives have proven to be devoid of self - seeking agents: this may represent a great enabler to obtain private funding. Trust, then, does not represent a deterrent to investors since it is based on the willingness to have a positive impact on society shared by employees and managers of social cooperatives, which has nothing to do with conventional profit - maximizing mechanisms that permeate the conventional economic theory. Hence, social cooperatives have always been incredibly transparent for what concerns their statements,

## 1.4 Towards a social cooperative enterprise

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since they don't need to deceive their stakeholders. What social cooperatives are required to do, today more than ever, is to further develop the "enterprise" part of the family of organizations they are a part of (the social enterprises), that is, being even more market - oriented than they already are. According to Thomas (2004) social cooperatives are "proactively committed to securing orders" [3], which is what conventional lucrative firms do, with whom they have to compete since the orders Thomas refers to are of private nature too. Moreover, social cooperatives are concerned by a triple level of competition:

1. Inter-categorical competition [3], among all types of firms, enterprises, families and public bodies (this type of competition is true for all the players in the social space defined at the beginning of this section;
2. Inter-categorical competition, that involves social cooperatives and other types of cooperatives;
3. Extra-categorical competition: it happens between social cooperatives and private or public players that could be potential customers if they choose to externalize activities that were previously integrated inside these organizations.

To win these markets (or quasi - markets, as previously defined) social cooperatives can rely on the trust-based climate they have been building overtime, expanding it also to the other economic entities involved in the social space, fostering the decrease of transaction costs and boosting their networks. Moreover, constraints on obtaining benefits are very relaxed for this type of organization. This is again possible thanks to the Reform of the third sector. Last but not least, if on one hand conventional for - profit firms benefit from their size or their measurable technological progress, social cooperatives can thrive by establishing economies of scope, since they have been historically able to provide services that have similar origins but respond to the needs of a heterogeneous group of customers. Exploiting economies of scope allows to reduce costs, but establishing them is, again, a call for innovation and

## 1.4 Towards a social cooperative enterprise

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entrepreneurial behaviours. Besides economies of scope, then, social cooperatives are able to activate so called economies of sharing [3]: that is, they are able to provide new services thanks to the spillovers of the wide variety of competences that their workers give proof of. The ability to activate these economies of sharing is due to two main factors: first of all social cooperatives workers are driven by higher motivation, since they directly benefit from providing services aimed at helping those in need; secondly they are not just service providers, but they constantly have to reshape their services accordingly to the needs of the beneficiaries (which makes these enterprises the best in terms of relational marketing). In light of such a great performance during the years (a performance delivered in an environment where shared value and culture are very strong and shareable) it appears obvious that the need of encouraging and supporting entrepreneurship in this context should at this point be shared among all those players which want to recapture the value lost in all the underemployed socioeconomic resources.

### 1.4.1 Keeping friends close, keep investors closer

As aforementioned, social cooperatives have to be supported in their need to enterprise. To do so, they need money and support services. As for the first, it comes from investors. How can a social cooperative attract, convince and retain an investor? First of all, ethical investors are the ones that have to be attracted: they are less inclined in gaining money and they are in having their money used in a morally virtuous way, expressing their personal interest in issues concerning outcasts of society. Once the closeness between a social cooperative's aim and the investor's values has been proven, to convince and retain such an investor the fund collector has to be very vigilant on the outcomes and feedbacks on the organization's performance and has to put in place a precise method in terms of management. To achieve all of this, in other words, the fund collector (that is, the managers of such organizations) has to attain good portfolio management, which is at the basis of innovating behaviours for a significant number of enterprises (for and not for profit).

## 1.5 Innovating behaviour in social cooperatives

The Istat research on Structure and Performance of Italian Cooperatives also dealt with innovation and digitalization in Italian Cooperatives. For the sake of this thesis we only focus of innovative profiles deriving from CIS data gathered between 2014 and 2016. This study is based on a synthetic indicator, “Innovation”, built ad hoc for this research and based on the presence/interaction of the different kinds of innovation (product, process, organizational, marketing) in the studied cooperatives. Even though this study concerned all the types of cooperatives present on the Italian territory these data are considered realistic also for social cooperatives since they are a significant part of the total (1.4).

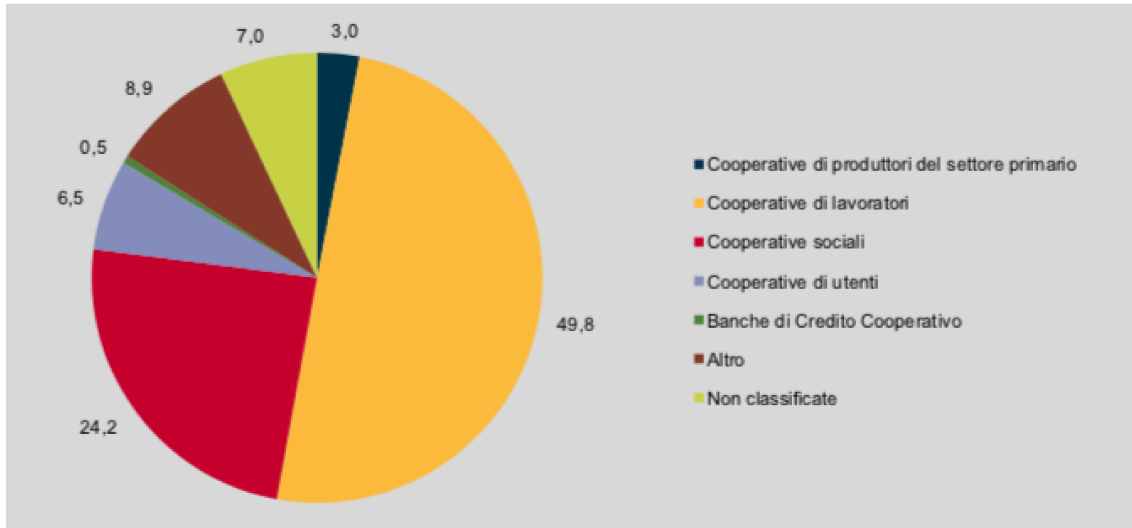


Figure 1.4: Cooperatives in Italy [4]

As emerged from the table shown in figure 1.5 Italian cooperatives are less prone to actuate product or process innovations while they are not too distant from other kind of enterprises in terms on organizational and marketing innovations. Figure 1.6 shows that units with scarce inclination to innovate are more than 50% for conventional enterprises and around 66% for cooperatives but the number of conventional enterprises that present an higher value of this innovation indicator is remarkably higher than the number of cooperatives.



## 1.5 Innovating behaviour in social cooperatives

TIPOLOGIA UNITÀ	Digitalizzazione	Innovazione di prodotto	Innovazione di processo	Innovazione organizzativa	Innovazione di marketing
Cooperative	0,17	0,14	0,14	0,21	0,21
Altre imprese	0,33	0,28	0,28	0,29	0,23
<b>Totale</b>	<b>0,32</b>	<b>0,27</b>	<b>0,27</b>	<b>0,28</b>	<b>0,23</b>

Figure 1.5: Innovation indicators for cooperatives and other enterprises with more than 10 employees [4]

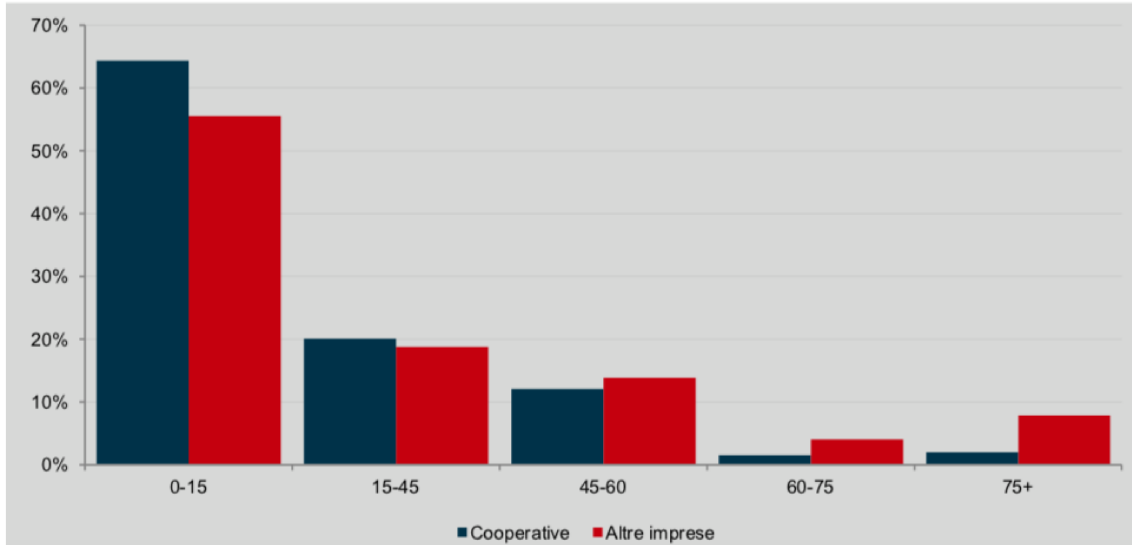


Figure 1.6: Cooperatives and other enterprises with more than 10 employees according to the Innovation Indicator [4]

The difference in the implementation of innovation models between cooperatives and other enterprises might be explained by factors of different nature (economic context, size, market etc.). Figure 1.7 shows that the most determinant factors for innovative propensity of cooperatives are linked to the economic dimension, the degree of vertical integration and level of employment. These factors (in particular the one linked to the economic dimension in terms of revenues) are of high relevance for other types of enterprises too: this further confirms that cooperatives (and, thus, social cooperatives) witness the same dynamics that interest conventional enterprises.

## 1.5 Innovating behaviour in social cooperatives

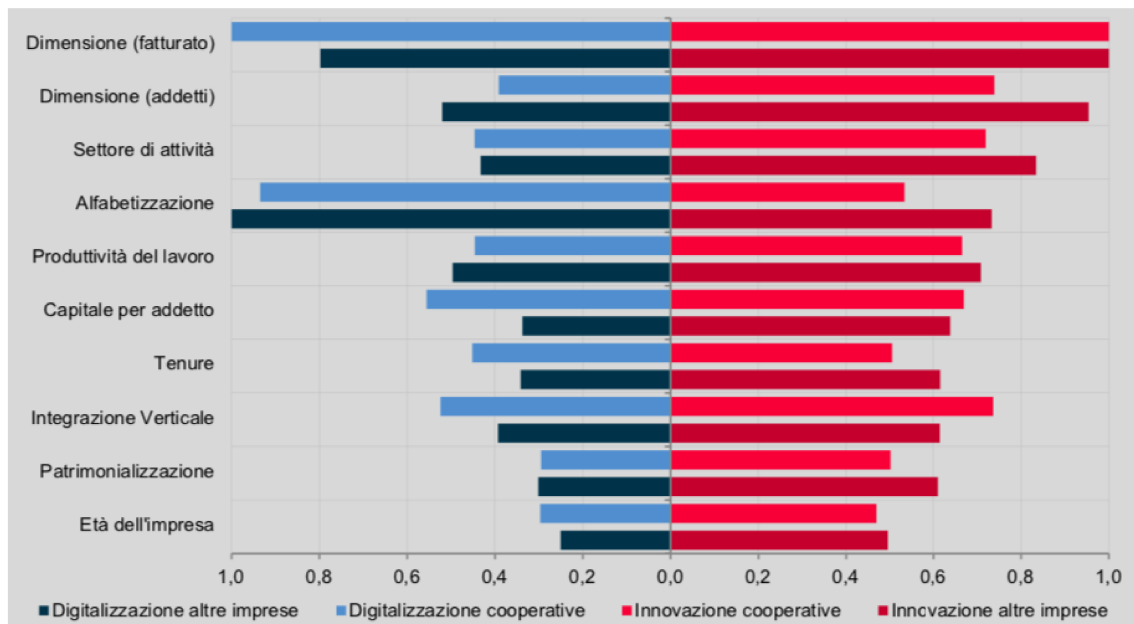


Figure 1.7: Relative importance of variables in defining the innovative inclination of cooperatives and other enterprises [4]

## Section 2

# Platform design

### Summary

This section consists in an overview of the theoretical basis behind the project carried out inside the social cooperative Stranaidea. Starting from fundamental concepts such as the the ones of service and architecture everything builds up to platform design in order to elucidate about the procedure applied in the project, discussed in the following section. The focus here is centered on the applicability to services of theories and methods conventionally linked to products, retrieved from an extensive literature review.

## 2.1 Designing a service

Service design can be tackled by four different perspectives, which vary depending on their different conception of service and on the different Design schools they stem from [11; 12].

### 2.1.1 What is a service?

Before going in depth in service design theory a brief discussion about the concept of service should be carried out. As a product is composed by tens, hundreds or thousands of components, so is a service. The difference lays in the fact that services aren't an aggregate of physical parts, but of people, competencies and processes, which make up their architecture. In order to make processes and competencies appropriately integrated with each other inside the enterprise, numerous decisions are taken at different levels of the firm: from the strategic to the operative one. The biggest challenge for service providers is to make sure that these decisions are taken in a consistent way throughout all the levels of the organization. In designing and developing services the service concept [13] has a pivotal role. It has been defined in several ways: particularly relevant the definition given by Edvardsson and Olsson (1996) that refer to the service concept as to the prototype of what has to be delivered to the user and how it can be achieved in detail (hence, this goes under the name of “what and how approach”), who centered the focus of their investigation on customer needs [14].

No matter what the approach, the more one studies the more the focus on the customer emerges. The role of customer needs has gained a more and more central role over the years in different, albeit linked, fields: from entrepreneurship to product innovation and development. The starting point of every project that has a target within a market within an economic system is not the knowledge of the macro variables at the system or market level but the insight on what does our target want, what are his or her needs, or, in another world, his (or her) ask.

### 2.1.2 Service design

As observed by Kimbell, Design is characterized by two different traditions, one deriving from engineering, which considers design primarily as problem solving and another coming from the art world which is more incline to perceive design as an explorative investigation process.

Design, in the engineering tradition, can be specified *ex - ante* by using systematic procedures and rigorous methods. When talking about services, then, this theory can be subdivided again in two different branches. If the service is considered as a type of product that has to be manufactured (that is, if the service is considered as a product, but intangible) one can refer to New Service Development (NSD) and Service Innovation [15; 16]. Differently, if the service is considered not only as an immaterial outcome of a project activity, but also as a process in which conceptualization and production cannot be separated and as a locus in which resources, experience and knowledge are exchanged among the actors [17] than one has to refer to Service Dominant Logic (SDL) [18]. It has to be said, though, that even in such a case where the service is viewed as a process and the knowledge exchange is focal to the project [19], the design choices are still supported by strict and systematic methods [20].

On the other hand, when Design is conceived as an explorative investigation process, the service can be again considered both as an output and a process. In the first case, the most shared methodological references are Design Thinking and Co - Design, which can be applied to different types of both products or services. Concerning the latter, the service is not considered as an outcome, but as a process or, more precisely as an action platform, that is, a basis for the action of a variety of actors in time. In this case the focus is on the temporal nature of services, which is adopted in the Design for Service [21], [22] literature.

Recently, there has been research effort fostering the merging of the two different traditions [23] about design mentioned above. The core of this fusion lays in the focus of both these methodologies: the human factor. Hence, Service Design is

defined as a “creative and iterative human centered approach aimed at creating new services and incorporating multiple contributes coming from different fields such as service marketing, operations and information technology, all integrated through design-based methods and instruments” [24]. This thesis adopts this latter perspective, based on a strong conviction that the typical methodological precision of engineering approaches should not be an obstacle for designers’ freedom in exploring the complexity behind considering the service as a process and in involving all the actors concerned by the service. If anything, in some cases, the engineering rigor could support both the understanding of the service functioning mechanisms and the generation of valid alternatives.

### 2.1.3 The concepts of architecture and modularity

Product architecture is defined as the relation among its functional elements, the mapping of functional elements and physical components, the interfaces among physical components.

An architecture can be either integral or modular: in the first case components are functionally interdependent. This means that to provide a specific function components have to be coupled according to a predefined and necessary scheme. In the latter case components are functionally independent, which means that there exists a 1:1 relation between function and components. In other words, each component can provide its function without having to be coupled necessarily with another one. Integral architectures favour the general performance of a product, at the expenses of local ones at the component level, while modular architectures allow to develop different design alternatives which rely on the same architecture. This second option generates flexibility in the adaptation to demand evaluations or changes, since it allows to expand the offer both vertically and horizontally and also to transform the offer in time, creating variations of the product (product generations) at a relatively low cost.

Truth be told, in general a product can be subdivided in sub-systems that present

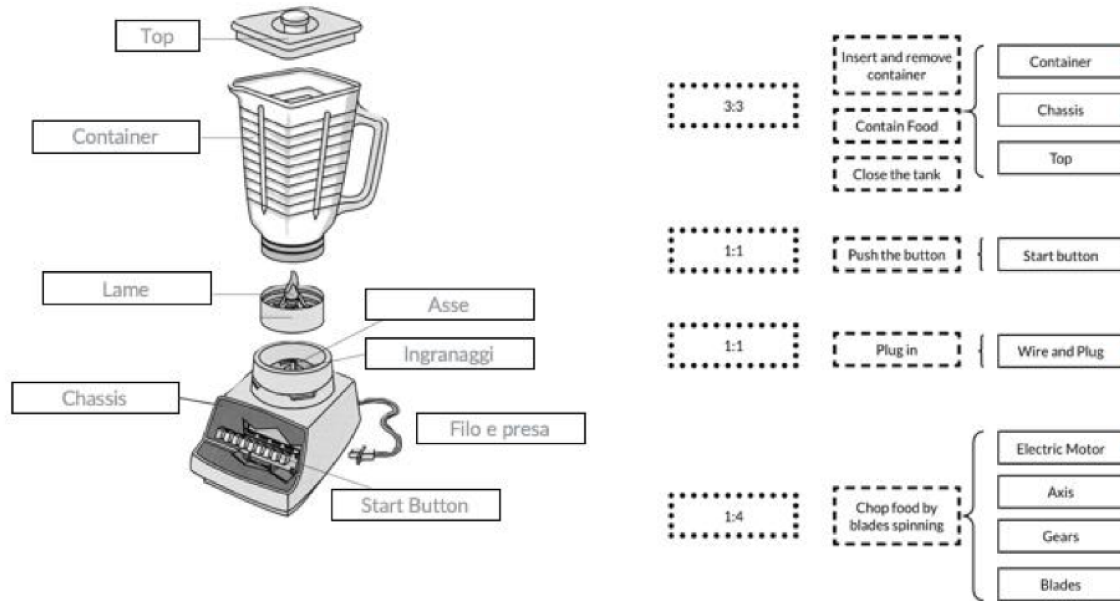


Figure 2.1: Decomposition example of a food processor

different architectures. Hence the same architecture (the product as a whole) cannot be defined in a unique way: in other words, the concept of product architecture cannot be presented as a binary concept but as a spectrum of more-or-less integral configurations.

As shown in the food processor example in figure 2.1, the first ratio indicates an integral architecture, since 3 different components “co-operate” in the provision of 3 distinct functions (there is, then, a  $n:m$  type of ratio among these functions and components). The second and third ratios show modular architectures, since a single component provides a single function. The last ratio does not indicate any interdependence among functions, but only among components, which makes it hard to define it as either modular or integral. Besides this, the architecture shown in figure 2.1 can be considered to be more integral than modular.

### 2.1.4 The platform concept

Platform based product design is a strategic approach often used in innovation management in order to efficiently develop a wide range of products based on a

unique common array of components and technologies. This components sharing can be useful to conceive a range of product or to differentiate the offer and define product families over time.

It goes by itself that a product platform will be strictly linked to the architecture that the sub-systems have in common: hence, the design of products based on the platform is strictly associated to the design of such architecture (that will be addressed as “the platform” from now on).

To better understand the difference between module and platform one can refer to Lego blocks. The Lego block represents a module, that is a functional independent unit (that replies itself according to the number of available blocks) capable of delivering its function in different ways, depending on how it is coupled with other similar or dissimilar modules. This coupling happens at the local level (in other words, this coupling creates a sub-system), can be modified and differentiated, and it does not have to be replicated in the same construction (otherwise, the new configuration would represent itself a new module) or in different ones (otherwise, these two products would share that configuration and, thus, part of the architecture). When, instead, two constructions share part of their configuration repeatedly, this represents a platform. In this sense, the basis (which, in turn, is modular) on which the different Lego blocks are placed to realize a construction can be seen as a minimal platform for each construction.

Matrices in figure 2.2 present the same components on columns and rows: the dark cells show the presence of commonality between two components. Architectural choices are defined by grouping the components in blocks. In the first scenario (S1), for example, three different architectures are proposed for projects P1 and P3, with the definition of different blocks but the sharing of one of them .

### 2.1.5 In - or - out

Designing a product platform around an array of common components implies deciding which components have to be in-platform (that is, common to all the products



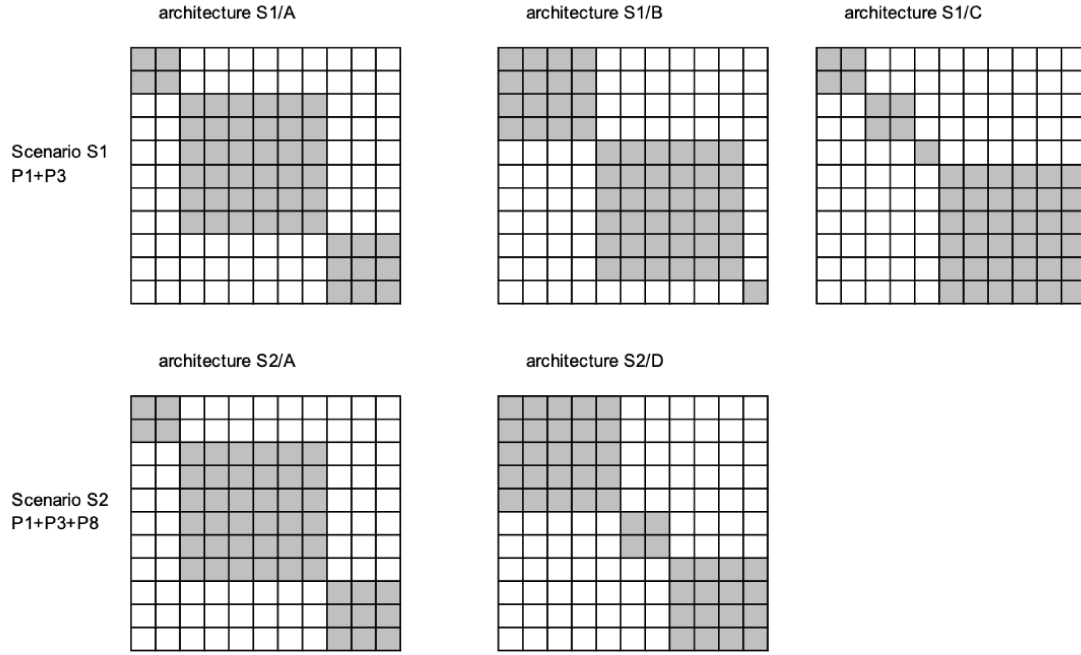


Figure 2.2: Building a platform

based on the platform) and which ones have to be out-platform. Researches on this topic carried out mainly by Ulrich (1995), Meyer and Lehnred (1997), identified two correlated conditions that determine whether it is appropriate to insert components in a platform [25; 26]. In other words these two conditions identify the commonality potential and the differentiation or specificity level among components. The first indicator shows the advantages that can sprout by sharing that component along the whole products family; the latter indicates how it is important for clients to have a specific component for each product.

A bi-dimensional map (as shown in figure 2.3) provides a visual tool helpful to make decisions about the platform based component sharing. Components with a high commonality value and low specificity value make the perfect candidates to be in-platform. On the other hand components with a low commonality value and high specificity value should be taken off-platform. Components with a low commonality value and a low specificity one can be usually shared. Critical decisions

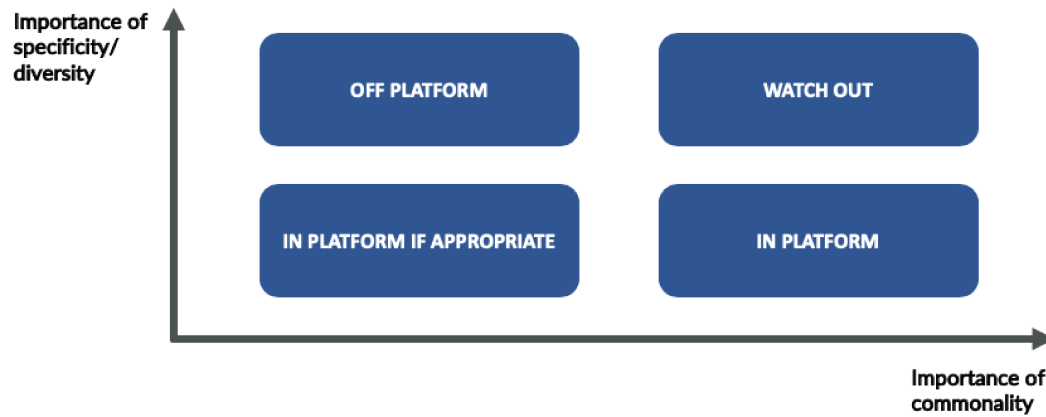


Figure 2.3: Components mapping for platform composition

can eventually emerge when dealing with components with high values of both commonality and specificity. The firm will have to decide whether to seek advantage in term of costs or to base its decision on the consumers' preferences. In some cases components can be suited for hybrid solutions. For example, the component can be shared among products, but some of its functions or features may be modified and/or disabled according to the needs.

This approach to innovation presents a series of advantages [6] . In primis, the chance to share resources and competencies on different projects, cutting costs for each new project. Platform - based product development, in fact, allows to organize common components and associated competencies among projects in a two-tier structure [6]: establishing a platform means creating a basis (of technologies or competencies) which, until obsolete, allows to kick off derivative projects without having to start from scratch every time. Moreover, since it is based on a set of resources and competencies consolidated in the platform, the duration of derivative projects is inferior to the one of autonomous projects. In addition to that these derivative projects, less costly and shorter in time in their development, allow enterprises to respond to changes in the market quickly and with the minimum investment possible. Hence, platform projects establish a basis of resources and competencies that, until obsolete, grants enterprises the opportunity to enact, through derivative projects,

a flexible strategy based on their (existing) offer. Eventually, at the organizational level, this mechanism automatically generates a separation between routine innovating activities (associated to the aforementioned derivative projects) and other more risky and radical innovations, thus helping the firm to clearly distinguish the risk and opportunities behind each project idea.

### 2.1.6 Adjacency matrices and commonality evaluation

Adjacency matrices theorized by Eppinger (1997) in [27] are a consolidated instrument to study a system's component relations and Lanner and Malmqvist's optimization procedure (1996) is usually employed to position elements in the same block ( or "chunk") or to separate them in order to define the configuration of a module of the system [28].

Commonality and specificity evaluation methods are instead very argued and debated upon. Objectives consistency, process factors, cognitive coherence are some of the factors that influence the perceived similarity between modules. In spite of this, if one adopts the original functional perspective, the degree of commonality represents the number of function shared among modules, while the specificity is given by the different number of functions embedded in each module. This vision offers simplicity and reduces ambiguities: that's why this is the method applied in this case.

There exists a variety of commonality indicators: the Degree of Commonality Index (DCI), the Total Constant Commonality Index (TCCI) are the most famous ones.

## 2.2 Service architecture, modularity and platform

The application of concepts such as product architecture and modularity in service design is quite recent, but raised increasing interest in the last ten years [29; 30]. These concepts emerged from Service Innovation and New Service Development do-

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## 2.2 Service architecture, modularity and platform

mains, but received attention also from fields such as Service Operations, Marketing and Management. These new research areas refer to Simon for what concerns the belief that a service has an architecture that can be broken down, as it happens for products [31; 32], [33]. A service can be decomposed in the same way a product can be decomposed into many components. The difference stays in the fact that a service is not the combination of physical entities, but of people, competencies and processes that form its architecture. Moreover, service architecture can be seen both in a static way (that, is, as the combination of people, competencies and processes) and a dynamic one: a focal dimension of service architecture is agility, that is how rapidly the service (or the service provider) can react to changing demand [5].

### 2.2.1 How to break down a service system

This topic is still very debated upon since the multidimensional nature of services does not make it easy to decide which decomposition logic should be used. Voss and Hsuan (2009) revised the concept of product architecture in its application to services defining a service architecture according to a functional logic. Specifically, Voss and Hsuan draw their theory on the basis of the decomposition levels suggested by Mikkola (2006) in [34], which can vary depending on the nature of the architecture (integral or modular or mixed). However, since services have both an outcome and a process dimension, other researchers distinguished between outcome modules and process modules [30; 35]. Moreover, service attributes, sectors and the analysis' granularity level (i.e. Industry, enterprise, service bundle, components bundle) bring to additional module definitions. More complete frameworks try to take into account all these aspects together, underlining the marked advantage of their application in service design.

Each of these methods has its own theoretical and methodological validity: the author believes that applying a specific logic instead of the others depends on the studied service, the context and the design goals.

### 2.2.2 Designing modular services

Once the concept of modularity applied to services has been accepted, it goes by itself that platform methods valid for products can be employed to design the architecture of modular services. Platform design has, in fact, been applied to a wide variety of service contexts such as healthcare, financial services, and IT services. Researches focused on service platforms identified two correlated conditions that determine whether a component should be inserted in a platform (as happens for products) which are again: commonality potential and specificity level (according to users' needs). Even in this context there are several definitions for these indicators that stem from the original functional perspective and arrive to more complex decomposition methods such as the Service Modularity Function theorised by Voss and Hsuan (2009)[5].

## 2.3 Modularity: from products to services

The concept of process modularity comes from the manufacturing industry, in which the benefits linked to the standardization of manufacturing process modules (which allows effortless replication and/or addition of new modules in response to changing requirements) have been quickly recognized. Standardizing process modules, though, means standardizing the whole process itself [5]. As it has been recognized (as mentioned before) the presence of a dual core when speaking of services it seems reasonable to study and understand the methods applied in manufacturing in order to transfer them into service design. The general principle to be followed is that what is recognized as standard should be ordered first, while what is recognized as customization processes should be inserted later on in order to make customization cost-effective (like the derivative-project optic described above). Modularity may represent a way to sustain competitive advantage in service industry. The trade-off that has to be taken into account is the one between the uniqueness of service modules (which corresponds to the uniqueness of the competencies put to work)

and the possession of a relatively high degree of modularity, which, exception made for substitutable (or replicable) unique service modules, brings an higher level of standardization.

### 2.3.1 Defining complex systems

A system (defined as an organized scheme or method) for which designers have specified how the system's functionalities (either a product or process) can be decomposed into individual functional elements and how these individual functional elements interact to provide the general performance [36]. Simon (1962) defines a complex system as a system made up of a large number of parts which interact in a non-simple way [37]. Moreover in such systems the sum of the part cannot represent the whole, since its value is given by how the parts are interfaced and organized. The first category of systems theorized by Simon is the one of hierarchical systems, which are complex systems that can be further subdivided into sub-systems, which, in turn, can be subdivided again (an so on). What's peculiar of hierarchical systems is that, since they can be decomposed, their behaviour can be analyzed into the independent components, each one having a behaviour which is more or less influenced by the others. Voss and Hsuan (2009) start from a systemic view in order to study the possible application of a mathematical model for decision making in services [5]. The hypothesis on which their research is built upon is that a service system and its parts can be rendered into nodes (which, in turn, can be modules or components) and interfaces (that is, the links between the nodes). Thus, conceiving a system as a network helps in determining the right indicators and measurement tools to seize the system's complexity. This method was first used by Mikkola (2006) to analyze products like cars as complex systems.

### 2.3.2 How to measure modularity

In her seminal studies Mikkola (2006) searched for “a way to measure the degree of modularization embedded in product architectures [34]. In this research modularization is not treated only as something that prescinds design choices, but also as a strategic tool that can determine the ability of a firm in designing new product architectures. The depth of a decomposition in terms of product architecture is related to how deeply and widely the firm knows the system as a whole. Modularization can pave the way to exploiting both economies of scale and economies of scope: the latter, in turn, allow the firm to offer a higher degree of customization to its customers and assures fast responsiveness to changing demand. Moreover, modularity helps in the organization of complex processes: this has its downsides, of course, which consist in an increase in coordination effort since the deeper the decomposition the higher the number of possible modules’ configurations. Since modularization had emerged as a strategy in the sixties researchers put much research effort in understanding how the modularization embedded in product architectures could be analyzed systematically [34], in order to better understand how standard components could foster economies of scale, how new-to-the-firm components could foster product performance and the tradeoffs between the two. The main challenge in NPD (New Product Development) has always been the measurability of the various dimensions that characterize complex systems (as products can be). To address this challenge and respond to this need Mikkola highlighted the focal elements on which modularization depends on.

**Components,  $N$** : defined by Clark (1985) as a physically distinguishable part of a product that embodies specific design concept and delivers a specific function. Components can be standard ( $n$ ) or new-to-the-firm, customizable or non-customizable. Hence, four types of components have been highlighted by Mikkola, but for the sake of this thesis only the first dichotomy will be taken into account. More specifically, new-to-the-firm components will be referred as unique components ( $u$ ) from now on.

## 2.3 Modularity: from products to services

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**Interfaces,  $k$ :** defined as the linkages between components, modules or any kind of subsystem of the studied architecture.

**Degree of coupling,  $d$ :** it tests how “tight” are the connections (the linkages) among the components.

**Substitutability,  $s$ :** in this theory the term *substitution* is used accordingly to Garud and Kumaraswamy (1995) definition, according to which, “ technological progress can be achieved by substituting certain components of a technological system while reusing others” [34]. In other terms this element describes the degree of re-usability of a component. Substitutability activates economies of substitution, thanks to which firms can reduce their lead time in NPD, further exploit past investment and provide continuity to their customers. Obviously this concept applies only to unique components.

All these elements are put together in the ***Modularization function***:

$$MF(u) = e^{-u^2/2Nsd} \quad (2.1)$$

Where  $d$  is approximated as the average number of interfaces  $k$  per component and  $s$  is an estimation of the number of product families that use the unique component divided by the average number of interfaces of that component in all the product families.

$$MF(u) = 1$$

represents a perfectly modular product, in which no unique components appear.

This managerial tool theorized by Mikkola (2006) is a very powerful method for the assessment of a system and represents the methodological pivot around which the case study presented in the following section is based. The importance of such a model is due to the fact that it may highlight high-level implications of architectural decisions.



### 2.3.3 Service Modularity function

As mentioned in paragraph 2.3.1 Voss and Hsuan (2009) started from the concepts of *system* and the mathematical model presented above in order to make it applicable to services too. They define service architecture as “the way in which the functionalities of the service system are decomposed into individual functional elements to provide the overall services delivered by the system” [5]. Four system levels have been identified and considered sufficient to well represent a service system:

1. Level 0 - Industry;
2. Level 1 - Service company;
3. Level 2 - Service Bundle;
4. Level 3 - Service component.

These levels can be grouped in two different sets: for the first level (Level 0) architecture emerges rather than being designed. On the other hand, the firm has the ability to impact architectures with its design choices. Modular service companies are in general based of a core on which a set of more-or-less standard modules can be applied (which brings us back to the concept of platform described in paragraph 2.1.4). Level 1 represents the different kind of services offered by the company. Level 2 goes more in depth: service bundles are the constituent of the serve offerings represented on level 1. At level 3 each bundle is represented as a set of modules (or building blocks) which constitute the smallest service constituents on which design choices can be applied (let’s say it they are the atoms of the system).

Once the system decomposition has been defined, modularity can then be assessed on each level. For the sake of their research Voss and Hsuan (2009) used the example of a sea cruise (which presents a very differentiated, yet standard, number of services), as shown in figure 2.4 [5].

## 2.3 Modularity: from products to services

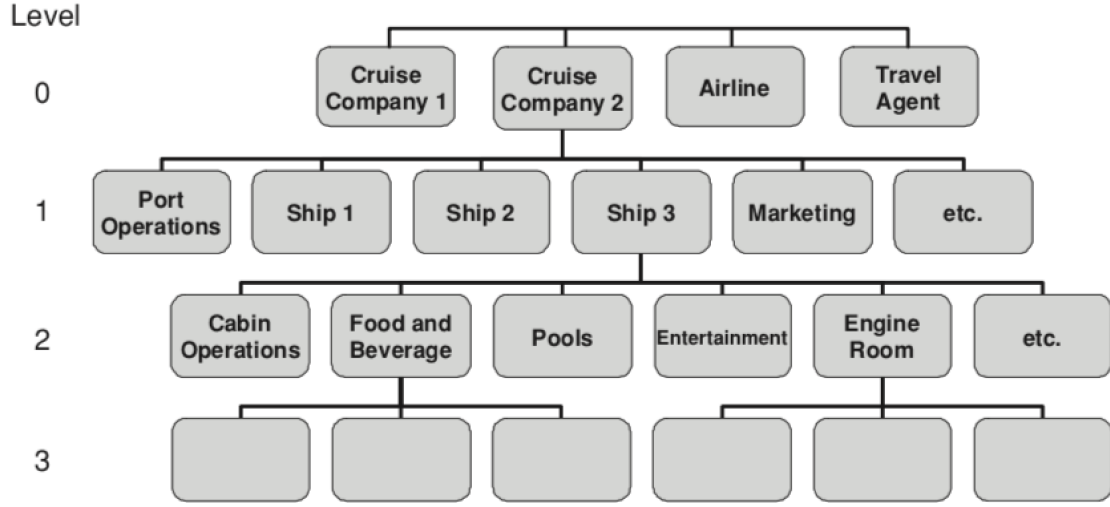


Figure 2.4: Decomposition example of sea cruise services [5]

The *Service Modularity Function* (SMF) theorized by Voss and Hsuan is directly derived from the one theorized by Mikkola:

$$SMF(u) = e^{-u^2/2Nf} \quad (2.2)$$

Where:

- $N$  represent the total number of *nodes* instead of components, which are again considered to be either standard ( $n$ ) or unique ( $u$ ).
- $f=d*s$  indicates the number of serving families along which the number of unique services  $u$  can be replicated.

The study of a system's degree of modularity starts from the lowest level (in this case, Level 3). With reference to the example shown in figure 2.5, let's say Food and Beverage service bundle ( $M_A$ ) presents 10 standard nodes ( $n=10$ ) and 2 unique nodes ( $u=2$ ) for a total  $N$  of 12 nodes, a number on linkages  $k$  equal to 66, and a degree of coupling  $d$  equal to 5.5 ( $66/12$ ). Food and beverage module can be replicated across 3 other service families ( $f=3$ ). The SMF for the Food and Beverage module is equal to 0.95, which shows a high degree of modularity.

## 2.3 Modularity: from products to services

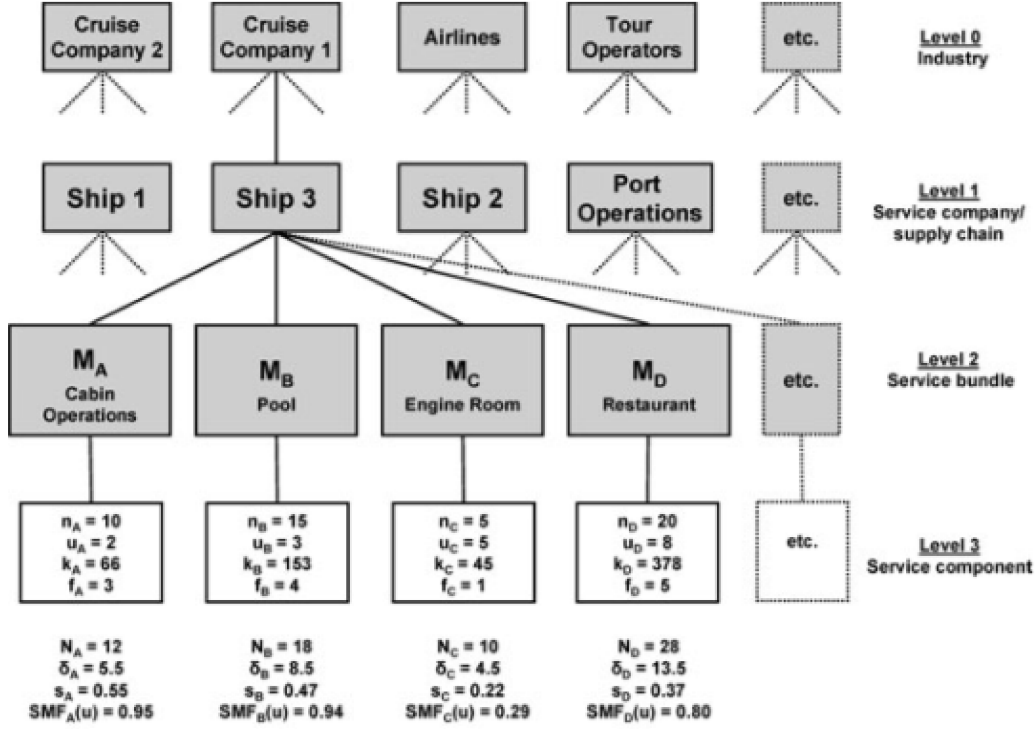


Figure 2.5: Configuration of a hypothetical sea cruise system [5]

The values calculated at each level represent the input values for the level above. Figure 2.6 shows how the degree of modularity varies with uniqueness. It is clear that different modules show different sensitivity to variation in the number of unique components ( $u$ ). This depends on the percentage of the total number of nodes  $N$  represented by standard (or unique) ones.

Module D shows a relatively less steep slope either because a significant percentage of standard nodes ( $n$ ) on the total or because the unique ones show a high degree of reusability (that is, can be used across several service families). In the first case, such a module presents great customization opportunities, since a small percentage of unique nodes allows to variate them without strongly affecting the architecture (and, thus, the provision) of the service.

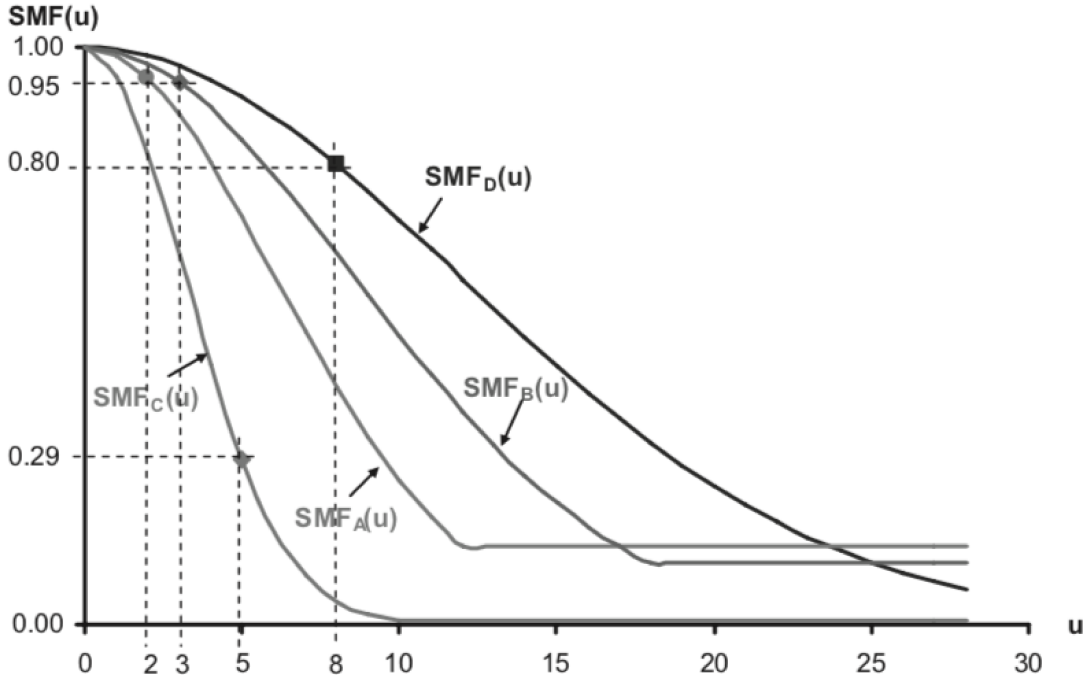


Figure 2.6: Graphical representation of the SMF of level 3 [5]

## 2.4 The Mirroring Hypothesis

At the beginning of paragraph 2.2 the agility concept has been highlighted with reference to service architecture. Being decisive for the degree of modularity embedded in service architectures, service design choices have to exploit the agility that can come from modularization since in contrast with products, services are characterized by high heterogeneity, especially in B2C service enterprises, where design choices impact both the front and the back office activities. Moreover, it not only allows to provide new services (as already said) but with minimal internal change (from an organizational point of view). Many researchers have focused their attention in the impact that product architecture has on the organizational structure of a firm. In fact, if product architecture is “the scheme by which the function of a product is allocated to physical components” [25] and if service architecture is the scheme by which the outcome of a service (or the service process itself) is allocated to specific actors, then an organizational structure can be defined as “the scheme by which the

function of an organization is allocated to different organizational entities” [38].

In this framework researchers have theorized the mirroring hypothesis according to which the structure of a product development firm must “mirror” the architecture of the product being developed [39]. In other words, the functions that co-operate to provide a determined product have to be organized in a structure derived from the product architecture, since it implies a partitioning of the tasks for developing the product similar to how the product itself is partitioned.

### 2.4.1 Mirroring and the concept of modularity

Since the mirroring hypothesis is concerned with how the architecture of a product, which is partitioned in a specific way, impacts the organizational structure the concept of modularity appears crucial to bridge the concepts of product and the concept of organization. As aforementioned, modularity shows to which extent a system can be broken down into nearly independent specialized functional elements (modules) and, since it has been proposed as a concept applicable to systems in general, it encompasses products and organizations too. It goes without saying that since the concept of modularity has been extensively proven suitable for services too, so does the mirroring hypothesis. A modular organization, indeed, can also be partitioned into distinct components (organizational entities: individuals, teams, etc.). These entities have to be “narrowly specialized, nearly independent and easily replaceable”. The rationale behind the mirroring hypothesis is that a specific type of organization (either modular or integral) can only develop a specific type of product (either modular or integral). A system’s modularization is more than the breaking down of the system in subprograms, but a responsibility assignment [40]. Once this assignment has been done, then the work on the independent modules can begin. This view of modularization stresses the fact that an architecture can be seen as both affecting the composition of a product/service and the way labour concerning that product/service has to be divided. Whatever the outcome is, a division of labour is needed because the actors of a firm that have to deal with the amount of

decisions an organization has to make don't have the processing capacity to consider and evaluate all the possible alternatives, being either humans or computers. [41].

Deciding to act primarily on the product architecture or on the labour division depends on the goal of the organization, without prejudice to the fact that, in the end one sphere (either product of organization) influences the other. In both cases the objective is to reduce complexity: in the first one concerning the product design, in the latter concerning the coordination effort of the team assigned to that precise design task. As will appear clear in the following section it may be argued that in the case of services the influence of service architecture on the organization (and vice versa) is much more evident, since a service is defined, as aforementioned, both as an outcome and as a process.

## Section 3

# Case study: Stranaidea

### Summary

This section describes the application of the methodology presented in the previous article to the specific case of Stranaidea. The adopted solution was developed applying rigorous procedures and smoothing them out by taking into account the human factor and the experience of Stranaidea's management. The final result shows that conceptual and rigorous reasoning can coexist and deliver satisfactory solutions.

## 3.1 Project content

Consistently with what has been described for the Italian environment, social cooperative Stranaidea s.c.s (from now on referred to as Stranaidea) witnessed to an increase in the diversification of the demand, together with an increase in the number of people to be considered in need of some kind of care that could then become beneficiaries of one of their services. This increment and consequent change forced Stranaidea to expand its offering and to satisfy demand in the most flexible way possible. This implied developing high level competencies in identifying the needs coming from the territory, revising already existing services in the portfolio and modifying the organizational structure in order to make not only the services but also the organization flexible (and, thus, able to deal with changes).

This being the conditions, the project has been carried out over two phases (shown in more detail in figure 3.1:

1. Processes analysis: an in-depth analysis of existent activities and related processes has been carried out in order to reach the final goal of revising the organizational model. This analysis has also been set to stimulate new innovation opportunities to eventually insert in the project portfolio.
2. Organizational model revision: a proposal for the evolution of the organizational model was put together. This initiative came from the cooperative's requirements and the previous analysis. The revision of the organizational model had been thought as a first and fundamental step towards innovation.

The analysis has been constantly shared with management both in terms of contents and applied methodology.

## 3.2 Phase zero: requirements and startup

Management request can be summarized as the creation of a “creative architecture”, that is an architecture designed in compliance with rigorous and systematic methods,



## 3.2 Phase zero: requirements and startup

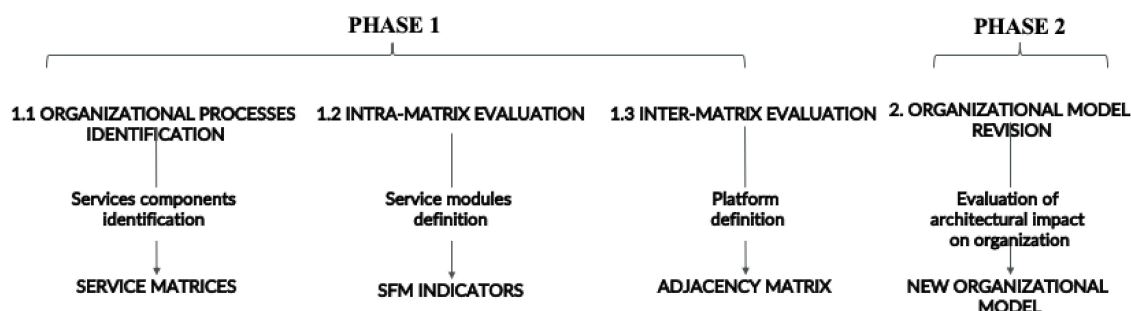


Figure 3.1: Work steps in detail

but that would not prescind from the mainly human and creative nature of the enterprise.

Prior to the first meeting with management two documents have been analyzed in order to carry out a preliminary assessment through which a first set of inconsistencies or innovation opportunities could be assumed to startup the work and draft a roadmap. The analyzed documents were the social report and the strategic development plans.. This allowed to identify the areas in which Stranaidea operates and the service offering active for each sector, as shown in figure 3.2 .



Figure 3.2: Services identification

### 3.2 Phase zero: requirements and startup

The classification showed in figure 3.2 was mainly due to a subdivision for sectors, typically linked to the fact that demand is mediated by the public sectors. This allocation, thus, takes into account the sector in which the cooperative provides some kind of service without making any kind of distinction either with respect to beneficiaries or with respect to the different activities that those services could require (since they addressed beneficiaries with different needs). This said, an initial hypothesis on possible point of contact among the different sectors was proposed, in order to foster reasoning around what was the final goal of the project: making the cooperative flexible. Figure 3.3 shows how the call for flexibility has immediately been traduced in a search for a platform. The main focus of the first part of the work (Processes analysis) has then been the possible emergence of a platform. Together

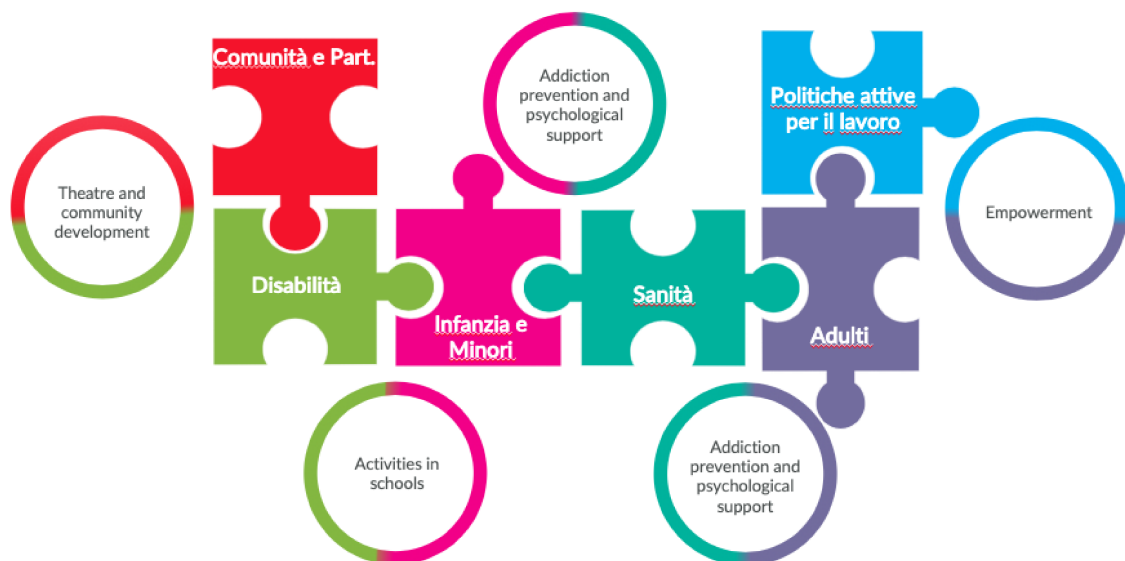


Figure 3.3: First draft of possible points of contact among sectors

with this first analysis of services some initial comments about the organizational structure have been made. The functional structure shown in figure 3.2 highly contrasts the aim of being more flexible. To explain this we have to refer to the two basic concepts of project and function: inside every project (and in order for it to be fulfilled) actions are carried out. Each one of these actions is linked to a

### 3.2 Phase zero: requirements and startup

function. On the basis of the coordination and communication required to go from one action to another (and, thus, from one function to another), the organizational structure of the enterprise that will work on that project is shaped. To address different coordination and communication needs that can concern different projects one can refer to four basic models: the inter-functional forms [6], represented in figure 3.4

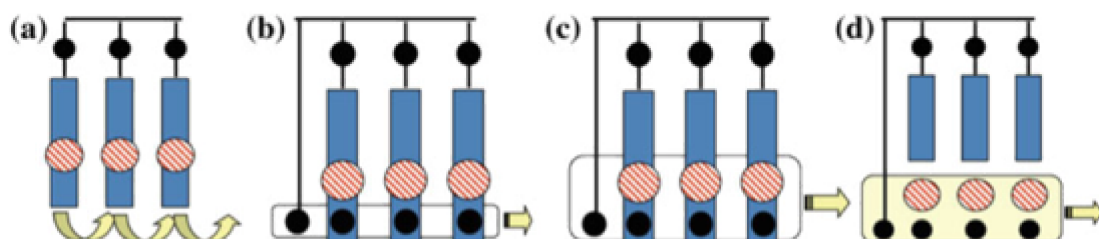
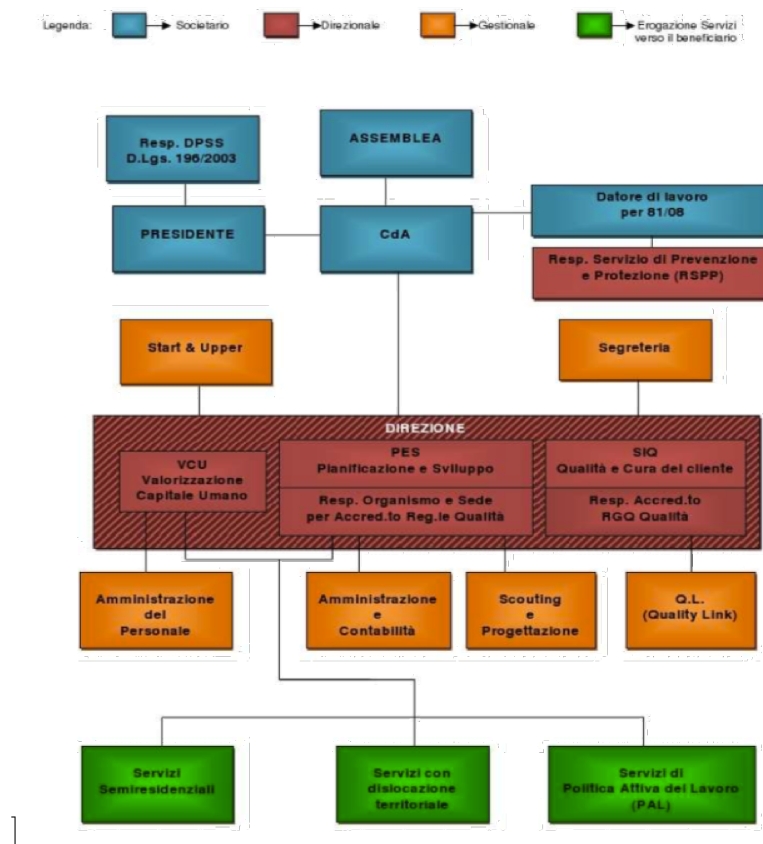


Figure 3.4: The four inter-functional forms[6]

Figure 3.4 a) shows a purely functional form: in this structure there are no resources directly assigned to projects, there is one manager for each function and coordination and communication are scarce. Figure 3.4 b) shows a lightweight inter-functional form where, again, resources are not directly assigned to projects, there is a coordination team managed by a project manager (even though with no formal authority). Figure 3.4 c) represents a heavyweight inter-functional form, where the resources are organized in a matrix structure, project managers have high authority and exert strong coordination. A drawback of this configuration is that complexity arises in reporting to two distinct managers. Lastly, figure 3.4 d) describes autonomous structures which consist of autonomous team outside functions, which are granted freedom of experimenting.

#### 3.2.1 Which form to adopt?

As a first intermediate conclusion after reading the aforementioned documents we could infer that functional and lightweight forms were already in use inside Stranaidea, thus fostering specialization inside functions, but locking the cooperative inside poorly innovative projects. A heavyweight structure could be adopted to foster incremental innovations, that are innovations aimed at improving already existing processes. An autonomous form would be perfect to implement radical innovations, but since it is not efficient in terms of resource pooling, it is suggested only for short periods of time. Since the driver that brought Stranaidea to take part to the call to tender by Compagnia di San Paolo was the need of addressing a new market, an aim of this project was to propose a transition at least to a heavyweight inter-functional structure.

### 3.3 Phase one: Process Analysis

The fact that Stranaidea services were conceptually split into sectors, as shown in figure 3.2, could have suggested that these sector might represent the independent

modules of the service system. Actually, the process vision imposed by the project and by the methodology applied (which, again, considers both the dimensions of a services: the outcome and the process) has instead led to a systematization in that sense: commonality had to be looked for taking into account processes, that is, the activities that define the offer.

To study Stranaidea service system Voss and Hsuan (2009) systemic view has been applied. Level 0, the industry level, has been limited to the Piedmont area, since, as mentioned in section 1, a social cooperative has to take into account its own competitive landscape to act as an enterprise. Figure 3.5 shows how the service system for Stranaidea has been broken down. As aforementioned, it is evident that level 0 could not be impacted by any re-design action; only level 2 and 3 have been analysed and re-designed. This is due to the fact that service platforms, our target, are more likely to occur at level 2 and 3 [5]. Level 3 is marked in red to remark that the bottom level has to be always the starting point for modularization analysis. Level 1 would automatically be reconfigured on the territory consistently with what would emerge by the re-design carried out in this project.

This said, the first step for identifying a platform has been carried out trying to find those activities or processes common to different provided services. The main idea was that, a process-wise analysis would have highlighted that these services were not internally integral, but had components organized and provided in a functionally independent way and in some cases communal to other services. The first hypothesis of points of contact among the different sectors, showed in figure 3.3 has been validated during the first meeting with management, but with some changes shown in figures 3.6 and 3.7 that had taken place after the publication of the analyzed documents.

Such changes, though, did not impact the theoretical basis on the project; at most, they further highlighted discrepancies between the assumed organizational structure and the real, yet still not clear, one.

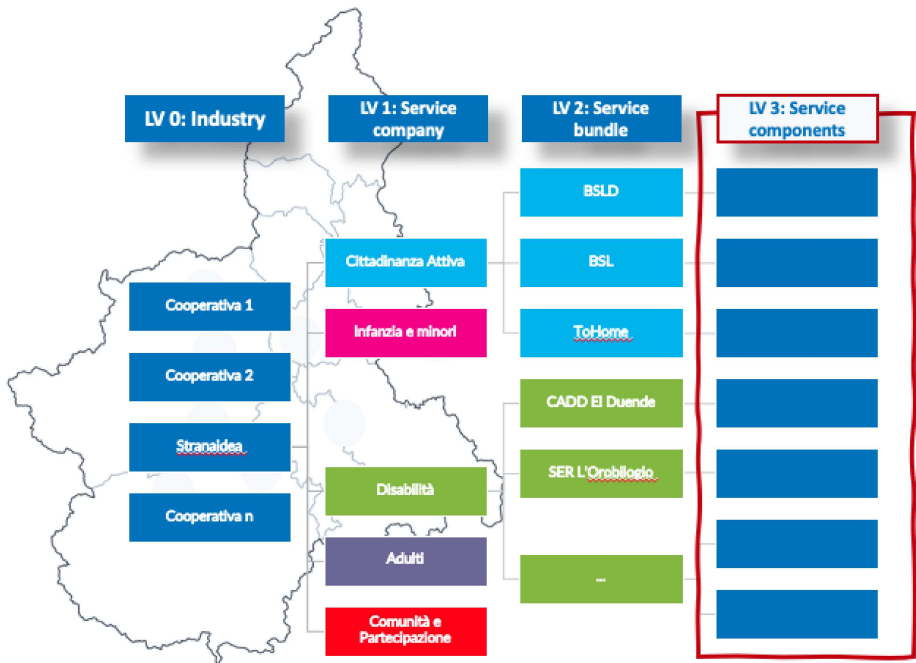


Figure 3.5: Systemic view of Stranaidea

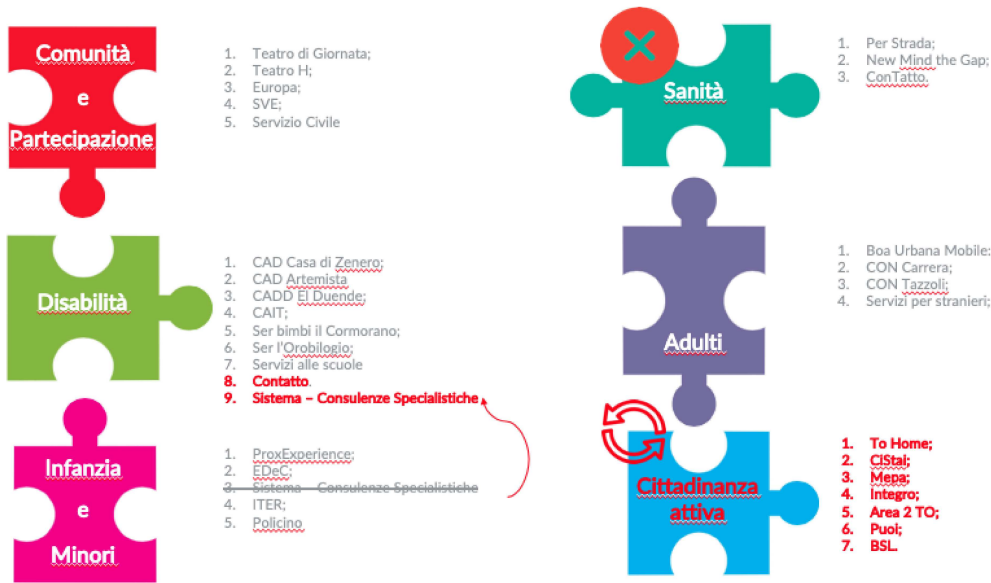


Figure 3.6: Revised service identification

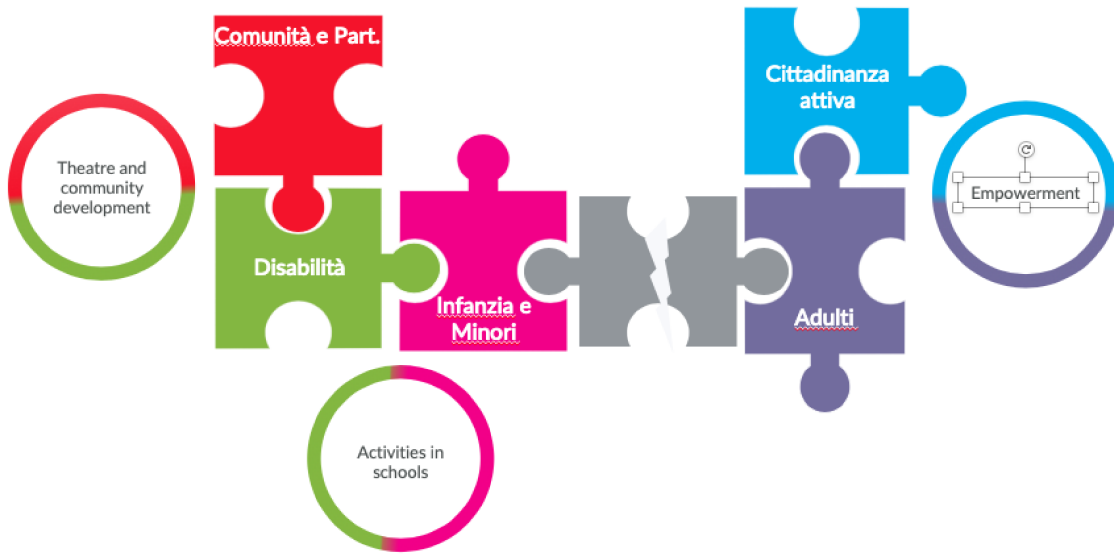


Figure 3.7: Revised points of contact

#### 3.3.1 The analysis procedure

Once the opportunity of identifying modules inside Stranaidea's services had emerged and once the existence of points of contact among different services had been observed, the following step has been to study the processes that compose the cooperative. The necessary information has been gathered through interviews, conducted with 12 referents of the different services . Interviews concerned:

- The identification of specific functions, that is, actions that act as service/process components (that could then become the variables  $u$  and  $n$  explained in 2.3.3, to be inserted in the SMF model), the identification of projects' owner, team subdivision and the association of specific subjects to the different functions for each service;
- The collection of qualitative and quantitative information that could support the evaluation of components commonality/specificity, the importance of a service for the cooperative, its compatibility with others and its reliability inside Stranaidea (won calls to tender, projects begun, personnel employed,

personnel fired, etc.). In general, information about the service evolution, on its present state and its future perspectives.

#### 3.3.2 The tool

In order to carry out the above mentioned analysis it was decided to use a simple matrix, showed in figure 3.8 that could help us in taking into account the process nature of a service, its target, its input and its output. All the beneficiaries' categories addressed by Stranaidea have been identified together with management and put on the rows, sorted by age, the expressed need and by the fruition mode (as individuals, families or community). All the activities carried out (on the individual, the household or the territory) have been represented on the columns. According to a process logic, the input of the service has been represented as the beneficiary (the user) before being inserted in an assistance and support project (that is, the beneficiary with his/her needs not yet taken care of); the output, then, has been again represented as the beneficiary, who sees an improvement in his/her condition thanks to the fruition of the service.

#### 3.3.3 The interviews

At the beginning of the project the process analysis started as a archive review of all the project done over time. During this preliminary phase the author realized that, besides the great number of missing files in the archive, which would have made the analysis almost impossible, the way it was being carried out would have led to poor results. The pivot of all the activities provided to the users is the human factor, or humanware [42], which is the key element of competitiveness in social cooperatives [3]: in this framework it appear obvious, at a certain point, that, to better analyse the cooperatives and its processes it was necessary to engage in direct contact with the people that “make” Stranaidea. Moreover, talking with the workers (mainly service managers) was a way to include them a process that could change their



### 3.3 Phase one: Process Analysis



Figure 3.8: Process matrix

culture, since the beginning. The author's aim, together with professor Francesca Montagna, was not to develop a solution handed down from on high, but to create an engineering result that could be integrated with the existent culture and way of working, without giving the impression of being an imposition rather than the spur to stimulate an innovative culture inside Stranaidea.

Hence, interviews became the main mean to "fill" the showed matrix through the description of each provided service, action by action, in order to obtain the most accurate information about the elements that constitute the service provision. Proceeding with the interviews to fill the matrices allowed to bypass the interviewees' bias sprouting from their orientation towards the beneficiaries, which means paying attention to the single action and not to the whole process regarding a service.

#### 3.3.4 Intra-matrix evaluation

From the data gathering carried out through the interviews, a matrix formed for each sector, previously represented in figure 3.6. The matrix, then, proved to be a versatile instrument both to validate the sector division as it was presented by management and to analyse the internal consistency of each sector. In other words, a check was made in order to verify if each service actually belonged to its sector. In particular, 5 matrices were generated: in each of these matrices the SMF (Section 2.3.3) was applied to each service, following Voss and Hsuan (2009) procedure. In this case, since the application of the SMF served mainly for an internal analysis, and not one that encompassed the 5 sectors as a whole, that is, not an analysis to be used above Level 2 (see fig. 3.5) the number of service families  $f$  in which the unique actions  $u$  belonging to each service could be reused was kept equal to 1. So, equation 2.2 was applied in the simpler form

$$SMF = e^{(-n^2/2N)} \quad (3.1)$$

Figures 3.9, 3.10 and 3.11 report an example of the intra-matrix analysis for the “Cittadinanza Attiva” sector. Each analyzed service shows an  $SMF_{\geq 0.5}$  (which has been thought to be a good criterion), confirming the belonging of these services to this sector (in other words, each service appeared coherent with the others). This procedure has been applied to all the sectors showed in figure 3.6, iterating it until all the matrices showed internal consistency.

Figures 3.12 and 3.13 represent the same procedure applied to the Disability sector. It emerged that older services directly meant for handicapped people such as “Artemista” or “Cormorano” have a high degree of coherence with their sector. The same cannot be said about “Assistenza Specialistica alle Scuole” or “Sistema” (which is the new service aimed at addressing the private market behind Stranaidea participation to SEED call to tender) that, following a conceptual (that is, non-mathematical) logic were moved to the sector “Infanzia, minori, giovani e famiglie” in

### 3.3 Phase one: Process Analysis

	CATEGORY	AGE	NEED	SERVICE	Ricezione segnalazioni	Incontro con ente segnalatore	Matching	Assessment	Progetto formativo	Orientamento	Valutazione tirocinio	Ricerca Aziende	Inserimento tirocinio	Valutazione finale	Monitoraggio
INDIVIDUALS	Disability	Childhood													
		Minors													
		Young	Work	BSL (x3)	Anche conoscenza diretta										
		Adults													
		Elderly													
	Immigration	Childhood													
		Minors													
		Young	Work	PUOI											
		Adults													
	Poverty	Childhood													
		Minors													
		Young	Home + Work	INTEGRO											
		Adults													
		Elderly													

Figure 3.9: Matrix for Cittadinanza Attiva: Individuals

	CATEGORY	AGE	NEED	SERVICE	Ricezione segnalazioni	Prelevamento	Assegnazione caso	Assegnazione operatore	Accoglienza	Regolamento con ente locale	Incontro con mediatore	Presenza in carico sanitaria	Screening TBC	Presenza in carico legale	Assessment	Progetto formativo	Interfaccia SS/CAS	Interfaccia con Servizio Centrale	Erogazione	Erogazione tirocinio e borse lavoro	Accompagnamento formativo / lavorativo	Valutazione tirocinio	Ricerca Casa	Ricerca Aziende	Monitoraggio
HOUSEHOLDS	Generic Discomfort	Childhood																							
		Minors																							
		Young	Home + Social segment	TO HOME																					
		Adults																							
		Elderly																							
	Immigration	Childhood																							
		Minors																							
		Young		MR. GRAB (CAS)																					
		Adults																							
	Immigration	Childhood																							
		Minors		MR. GRAB (SPRAR)																					
		Young																							
		Adults																							
	Poverty	Childhood																							
		Minors	Home + Work	CI STAI + MEPA																					
		Young																							
		Adults																							
		Elderly																							

Figure 3.10: Matrix for Cittadinanza Attiva: Households

accordance with management, since the latter included several services with almost same targets. As stated before, the searched results were not meant to create an imposition over management choices, but to stimulate a new way of reasoning. This is the case of “Contatto”, a service that, as shown in figure 3.13 has an SMF higher than 0.5 but that was also moved into “Infanzia, minori, giovani e famiglie” since it showed affinities, albeit conceptual and not proved by the applied model, with services belonging to that sector. These affinities have prevailed over the information given by the function both because of the scarcity of information gathered about this service (it is clear that the row correspondent to “Contatto” is less dense than

### 3.3 Phase one: Process Analysis

SERVICE	PARAMETERS	SMF
BSLD	n= 8 ; u= 0	1
BSLv	n= 8 ; u= 0	1
BSL	n= 8 ; u= 0	1
PUOI	n=5; u=1; N=6	0,92
INTEGRO	n=8; u=1; N=9	0,89
TOHOME	n=8; u=2; N=10	0,81
CISTAI	n=7; u=0; N=7	1
MR. GRAB CAS	n=9; u=1; N=10	0,95
MR. GRAB SPRAR	n=9; u=3; N=12	0,68

Figure 3.11: SMF application to Cittadinanza Attiva

the others) and because of conceptual consistency.

CATEGORY	AGE	NEED	SERVICE	Missioni negoziali una	Appoggio mentale in particol- are	Intervento con beneficiari e famiglia	Interfaccia con entità negoziali in	Matching	Incontro d'equipe	Primo in- contro accoglienza e	Assessment	Selezione del personale	Stipula contratto	Valutazione a breve termine	Observation	Redazione PDU/CDR	Valutazione della qualità	Ispezione di qualità	Organizza- zione e gestione attività	Schede Lab. U attività	Cartella educativa	Altre attività educative	Intervento con beneficiari e famiglia	Disposizione della attività	Trasferimento di attività	Raccolta feedback per adattare l'attività	Valutazione della attività	
INDIVIDUALS	Disability	Child.																										
		Educ.	ASS. SPEC. SCUOLE																									
		Minors	SER BIMBI																									
			ZENZERO																									
			ARTEMISTA																									
		Young + Adults	EL DUENDE																									
	DROBLOGIO																											
	Generic Discomfort	Child.																										
		Minors	Psych	CONTATTO																								
			Young	SISTEMA																								

Figure 3.12: Matrix for the Disability sector

### 3.3 Phase one: Process Analysis

SERVICE	PARAMETERS	SMF
CORMORANO, SER BIMBI, ARTEMISTA, ZENZERO, EL DUENDE	u= 0	1
OROBIOLOGIO	n=11; u=2; N=13	0,85
ASS. SPECIALISTICA SCUOLE	n=3 ; u= 3; N=6	0,47
CONTATTO	n= 3 ; u= 2 ; N=6	0,67
SISTEMA	n= 3; u= 3; N=6	0,47

Figure 3.13: SMF application to Disability sector

The sector “Comunità e Partecipazione” presented a very peculiar situation: all the services showed unique features than made them not coherent with one another (in terms of SMF); moreover, since the outcome dimension of the service is much more marked in this sector with respect to the others (since, concerning “Comunità e Partecipazione” one can often find “off -the-shelf” packages that are sold to the committent) these services appeared to be inconsistent also with other sectors. In this case, together with management, it was decided to follow a purely conceptual logic to re-distribute these services. All but “Teatro di disabilità” (which was moved on the column of the “Disabilità” sector as a process activity, and not on the rows as a service per se) were moved in “Infanzia, minori, giovani e famiglie”, which configured as a wider sector in terms of target and services offered, aimed at addressing generic educational needs.

Iterating the aforementioned process for all the sectors and moving services from one sector to another three final matrices were obtained, as shown in figures 3.14, 3.15, 3.16.

What emerges from these definitive matrices is that: the “Adults” matrix and the “Cittadinanza Attiva” one have been merged in a single sector since they share

### 3.3 Phase one: Process Analysis

	CATEGORY	AGE	NEED	SERVICE	Ricezione segnalazione/Accoglienza della domanda	Interfaccia con ente segnalatore	Incontro d'equipe/Matching	Presenza in carico e accoglienza	Assessment	Valutazione inserimento	Redazione scheda d'ingresso	Osservazione	Redazione PEI/GRA	Visita domiciliare	Incontri di rete	Organizzazione e gestione attività	Schede Lab. E attività	Cartella educativa	Allineamento cartelle	Interfaccia con altri servizi	Dimissioni e accompagnamento	Teatro di disabilità
INDIVIDUALS	Disability	Childhood																				
		Minors		ZENZERO																		
				ARTEMIS TA																		
		Young + Adults		DUENDE																		
		Elderly		OROBILOGIO																		

Figure 3.14: Definitive matrix for the Disability sector

	CATEGORY	AGE	NEED	SERVICE	Ricezione segnalazione/Accoglienza della domanda	Incontro con ente segnalatore	Registrazione caso e definizione obiettivi	Appuntamento con la famiglia	Matching	Presenza in carico e accoglienza	Intervento in classe	Incontri di rete	Assessment	Sperimentazione servizi	Matching con servizi	Redazione progetto generale/PEI/PA/PPG	Osservazione sistematica/Visita famiglia	Presentazione al nucleo familiare	Laborazione attività	Organizzazione e gestione attività	Monitoraggio	Stipula Contratto	Raccolta feedback	Relazione/Valutazione finale e di fine anno	Assessment e in altri servizi	Rendicontazione e fatturazione	Compilazione diario mensile	Stanza GRA	Spettacolo	Secondo spettacolo
INDIVIDUALS	Disability	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												
	Generic discomfort	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												
HOUSEHOLDS	Disability	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												
	Generic discomfort	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												

Figure 3.15: Definitive matrix for the Adults sector

	CATEGORY	AGE	NEED	SERVICE	Ricezione segnalazione/Accoglienza della domanda	Incontro con ente segnalatore	Registrazione caso e definizione obiettivi	Appuntamento con la famiglia	Matching	Presenza in carico e accoglienza	Intervento in classe	Incontri di rete	Assessment	Sperimentazione servizi	Matching con servizi	Redazione progetto generale/PEI/PA/PPG	Osservazione sistematica/Visita famiglia	Presentazione al nucleo familiare	Laborazione attività	Organizzazione e gestione attività	Monitoraggio	Stipula Contratto	Raccolta feedback	Relazione/Valutazione finale e di fine anno	Assessment e in altri servizi	Rendicontazione e fatturazione	Compilazione diario mensile	Stanza GRA	Spettacolo	Secondo spettacolo
INDIVIDUALS	Disability	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												
	Generic discomfort	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												
HOUSEHOLDS	Disability	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												
	Generic discomfort	Childhood																												
		Minors																												
		Adults																												
		Young + Adults																												
		Elderly																												

Figure 3.16: Definitive matrix for the *Infanzia, minori, giovani e famiglie* sector

the demographics of their target and respond to partially similar needs. Moreover the service “SER Bimbi” has been moved in the “Infanzia, minori, giovani e famiglie” matrix, because, even though it presented a high SFM inside “Disability” management preferred to move it because of its consistency (in terms of activities and needs) with the services present in the other sector.

## 3.4 Phase 2: Platform identification

Once the intra-matrix analysis had been completed the final step to deliver the main result of the work was generating a platform, carrying out an inter - matrix analysis, through the application of an adjacency matrix.

### 3.4.1 The adjacency matrix

In order to identify modules, that is, group of the system’s components that have high interdependency within but are nearly independent from the others both intuitive and analytical methods can be put in place. If a company wants to apply a more rigorous model to highlight intercomponent relations can use adjacency matrices [6]. Figure 3.17 shows an adjacency matrix applied to the food processor shown in figure 2.1. In this matrix  $A = [a_{ii}]$  each element  $a_{ii}$  shows the strength of the relation between component  $i$  and component  $i'$ . This value can be expressed as non-negative parameter ranging  $[-M...M]$  in case one would represent the danger levels linked to coupling two components with values below 0 and the benefit levels coming from their pairing with values above 0 or as nonnegative parameters ranging  $[0...M]$ , in case one would only represent the strength of the interrelationship between the components. When only the existence of a relationship has to be investigated this parameter can be reduced to a Boolean one  $[0,1]$ .

When the adjacency matrix is filled with Boolean parameters it is called Design Structure Matrix (DMS) [27]. Even though adjacency matrices have been extensively used in product development strategies, DSMs have been theorized to be

### 3.4 Phase 2: Platform identification

	CHASSIS	FOOD CONTAINER	TOP	WIRE & PLUG	ELECTRIC MOTOR	START BUTTON	GEARS	BLADES	AXIS
CHASSIS		1	1			1		1	1
FOOD CONTAINER	1		1						
TOP	1	1							
WIRE & PLUG					1				
ELECTRIC MOTOR				1		1	1		
START BUTTON	1				1				
GEARS					1			1	1
BLADES	1						1		1
AXIS	1						1	1	

Figure 3.17: Adjacency matrix example for a food processor

applied to product components as well as development processes, that is, to the activities that constitute such processes. In this framework, and since services have a strong process dimension, the DMS application to this case seemed to be the right tool to use to highlight the platform. Coupled activities are identified by the non-zero cells close to the main diagonal. The positioning of these cells depends of course on the order in which activities are displayed (the order must be the same for rows and columns in order to have a symmetric matrix). Therefore, the designer has to change this order by exchanging rows and columns to make non-zero cells closer or farther to the main diagonal, according to which is called the Lanner and Malmquist procedure (depending on the goal being aggregating or disaggregating activities). When the objective of the design is to aggregate components in modules, elements of the adjacency matrix are grouped in chunks (delimited by the blue boxes in figure 3.17) in a way that maximizes the sum of adjacency measures between components belonging to the same chunk [6]. This is equal to minimizing the sum of adjacency measures between components outside the chunks. In other words, the difference between the sum of the non-zero cells in the chunks and the sum of non-zero cells outside the chunks has to be highest.





### 3.4 Phase 2: Platform identification

columns have been switched according to the Lanner and Malmquist procedure (1996), in order to have the highest concentration of 1 close to the main diagonal [28]. Later, other switches have been made in order to put close those actions which presented higher affinity from a conceptual point of view (so that “functionally similar” action would come together). Figure 3.19 shows the functional blocks (or chunks) that came out from the adjacency matrix (respectively highlighted in blue, green, peach and beige). The decision of assigning the “Assessment” action either to the first or to the second functional block was at first taken according to the maximization criterion presented in section 3.4.1. Later on, though, during

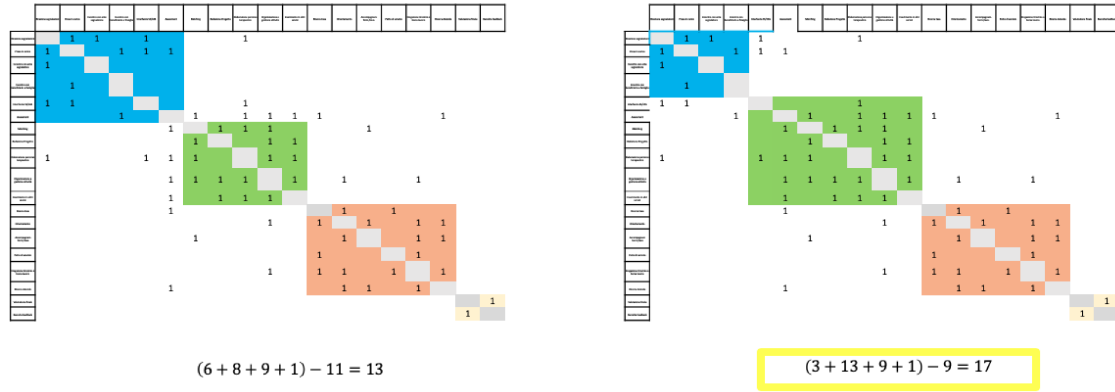


Figure 3.19: Adjacency matrix: functional blocks and score maximization

a meeting with management and the “Adulti” sector managers “Assessment” was moved in the first chunk, since it appeared conceptually more consistent, producing the final platform, as shown in figure 3.20.

The four distinct functional blocks have been eventually labelled as:

- Case Analysis
- Project definition and sharing
- Delivery (or Provision)
- Evaluation

### 3.5 Impact on the organization

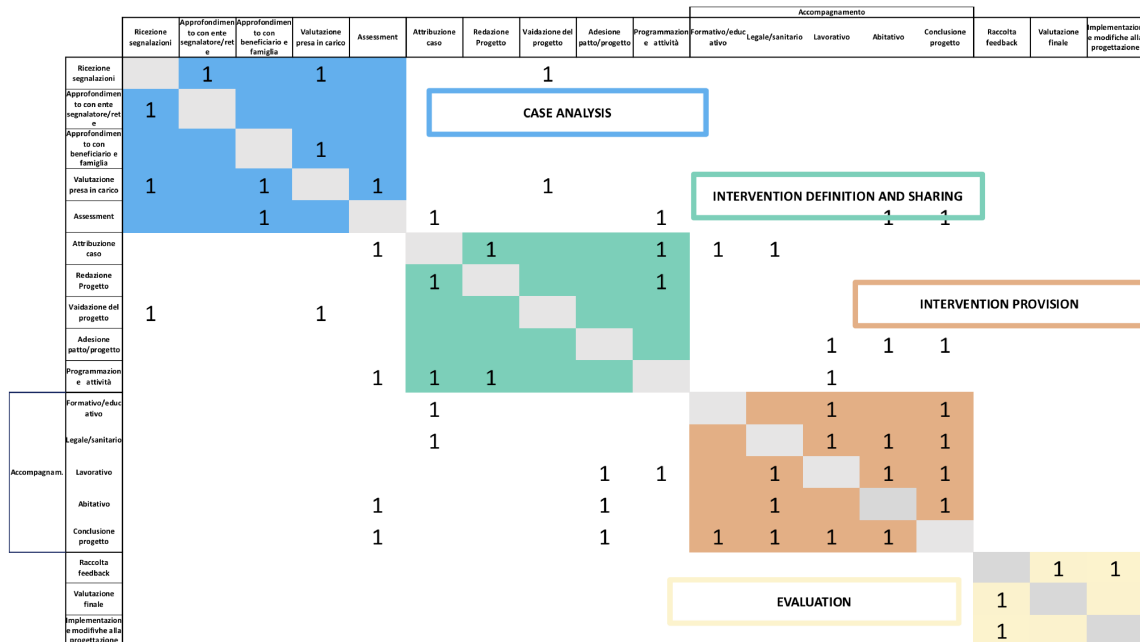


Figure 3.20: Definitive adjacency matrix

### 3.5 Impact on the organization

After presenting the final results to management, another request was made by the HR manager, concerning the organizational structure. In line with the aimed flexibility in service designing, a better work organization was needed since the expansion witnessed by the cooperative during the last 8 years had seen a chaotic distribution of tasks that prevented both management and the operational level to perform efficiently. During a brief meeting with the HR manager she asked if it were the right time to think about an intermediate level (a strategic one) that would serve as an interface between the management and operational levels. According to the mirroring hypothesis (section 2.4) considerations about this intermediate level and, as a consequence, on the whole organizational structure, led to matrix organizational structure, as shown in figure 3.21

This structure presents on one side the main functions linked to the process undergone by each beneficiary from the moment he or she becomes the object of the cooperative's assistance and support activities. In fact a dedicated function can be

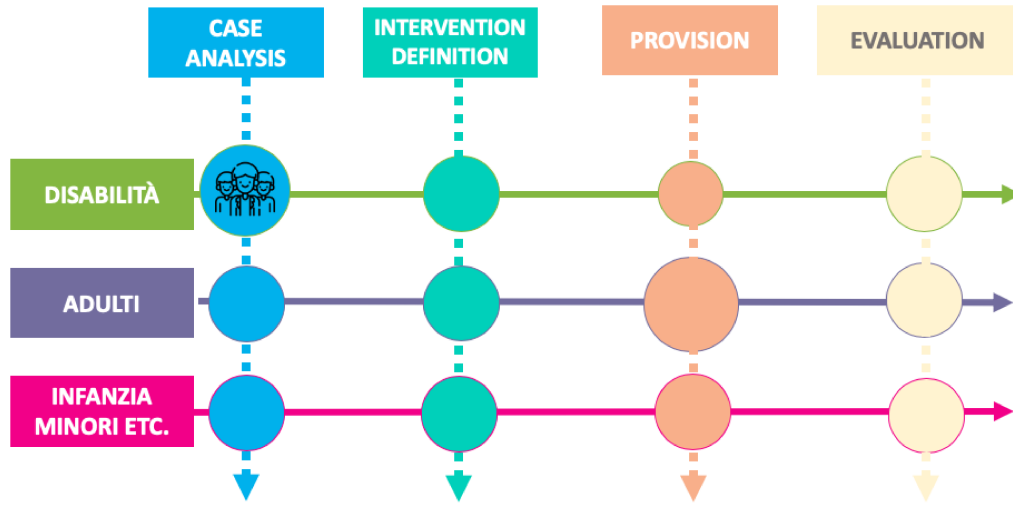


Figure 3.21: Proposed organizational structure

created with the purpose of developing specific competencies for each of the indicated activities. Each function will take place in the three definitive sectors according to the peculiarities of that sector; hence, in each sector there will be “experts” for that function within each sector. Each operator in each sector will have the responsibility to carry out each function for the beneficiaries of that sector. Moreover, for each sector, a point of reference will be identified for each of the aforementioned functions. These new figures have both a capillary and general overview of the situation within each sector and an inter-sector one and become essential to identify new needs and eventual gaps in the service supply. They represent the sensors through which Stranaidea will be able to exert its “product” innovation. The group of inter-sector experts in turn generates an intra-sector team. The latter has an essential function, since being able to supervise how the same actions are carried out in all sectors, highlighting problems, best practices and emergent competencies. They are pivotal to reason about procedural standardization or innovation. Changes can emerge either on the basis of change needs coming from such an inter-sector view, or in successful cases that can be appropriate to export from one sector to another. This is the context in which Stranaidea can perform its own process innovation.

### 3.5 Impact on the organization

The arrows coming out from the three processes in figure 3.21 specify that everything that is observed in the last phase of “evaluation” for a service/project goes “back in” in the form of feedback, changes, innovation in the strategic-managerial functions (those frames in red, orange and yellow in figure 3.22 in order to be reabsorbed by operative processes, guided by them).

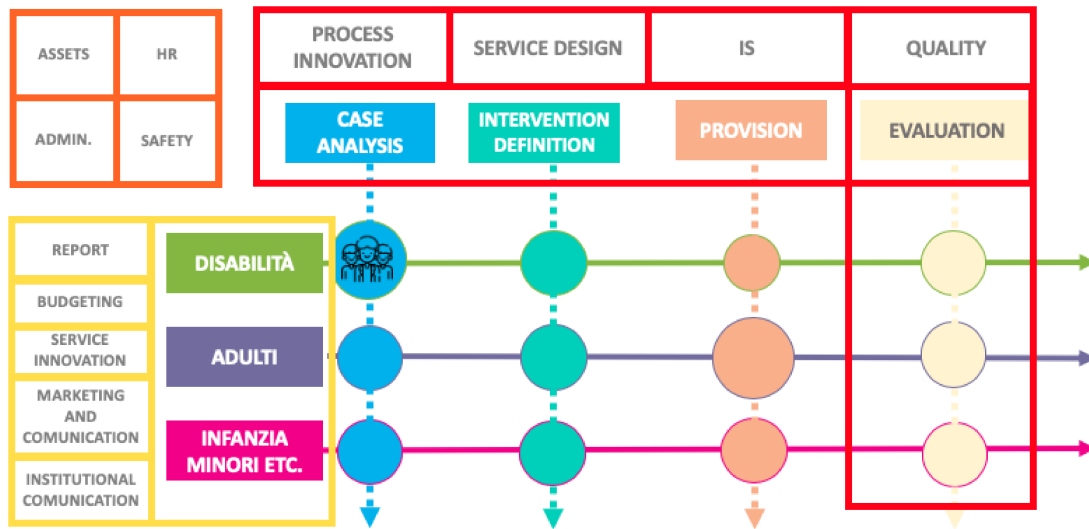


Figure 3.22: First formalization for the strategic-managerial level

#### 3.5.1 Delivering results to the organization

The aforementioned results were presented to management and service managers during a plenary session in which it was possible both to verify the level of understanding of the applied procedure coming from the people of Stranaidea and to test their first impression in relation to such changes. During this session, a couple of aspects that had emerged during the interviews came up again from the discussion: first of all the impression that some of the service managers did not feel any sense of belonging to a particular sector, which, in turn, restrained them from communicating with one another in the same sector to share both doubts and peculiar results or practices. Moreover, people working in each sector seemed very focused on their sector alone, taking for granted that what was happening inside of it in terms of

improved procedures or delivery methods was naturally happening in the other sectors too: because of this the need for cross-sector communication and confrontation have been fading over time. Hence, taking into account these internal aspects too, it seemed that the proposed solution in terms of organizational structure and responsibilities distribution addresses some implicit needs that were not clear to the client (Stranaidea) in the first place.

### 3.5.2 Correspondences with the NSCMM model

During the results presentation to Stranaidea's management it came up that the subdivision into functional blocks that made the platform emerge was similar to the subdivision made by a member of the management team (Gianluca Bruna), even if it spurred from completely different, and far-from-engineering, theoretical basis. Figure 3.23 shows what Bruna called the NSCMM (Nussbaum, Sen, Castelfranchi, Montorfano, Mazzoli) model, a name derived from the names of the scholars whose studies on capabilities and cognitive action as opposed to social action constitute part of the theoretical foundations of the whole cooperative's knowledge.

As shown in figure 3.23 the phases of "Case Analysis", "Intervention definition" and "Service delivery/provision" present in the platform correspond to the "Assessment actions", "Motivational actions" and "Support actions" shown in the model. The NSCMM model is based on what is defined as the mission entrusted to social workers by society, that is to activate and develop beneficiaries' autonomy, which, in turn, is the ability that allows them to fit in their environment, effectively pursuing their goals. In this sense, the actions that every social worker does in favour of any kind of beneficiary (an addict, a homeless, an abused child) are based on the same set of aspects that characterize every human being. This means that, following this cognitive model (that is, a psycho-sociological model that considers a persons acting on the basis of rational utility processes, driven by will and motivation), each project, independently of the addressed beneficiary, is based on a communal set of actions, data and information, just as shown in the platform model. This result is

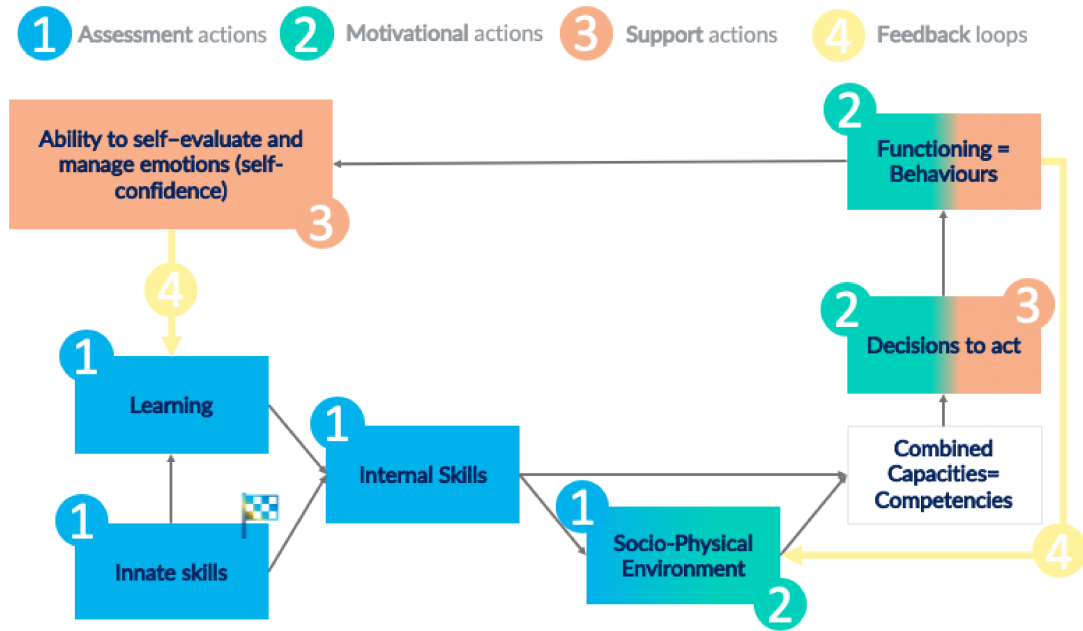


Figure 3.23: NSCM model

of great importance since theoretical models coming from such distinct set of competencies and study fields were able to lead to the same conceptual result, showing that conceptual and engineering approaches can coexist, since mathematical-logical methods led to a model similar to the one coming from analytic-inductive considerations derived from case studies. Moreover, the coherence between these two theoretical models shows how a study purely conducted with means of generic and rigorous organizational science methods and tools brought to an organizational functioning that is similar to the human functioning. In this sense, is it possible to state that the behaviour of a service oriented organization (in terms of processes) mirrors the behaviour of the target its services are addressed to?

# Conclusions

Stranaidea addressed the Production and Management Engineering Department (DIGEP) of Politecnico di Torino to analyze its services and organizational model with the aim of ensuring its consistency, flexibility and chances of taking new paths to innovation. The work has been carried out according to an action research approach; it allowed to customize the methodology of the analysis to the context and the object of the study. This allowed to deliver a result better than a mere outcome provided by analytical tools or systematic research, but something that could impact on the organizational culture of the client, improving the pre-existent ways of reasoning and working. As shown, this approach often led to the coincidence of experts' conceptual considerations and the ones driven by the consultants' mathematical and/or systematic method. The most relevant result in this sense has been the coincidence of the platform with the pedagogical method NSCMM.

The work brought to the definition of service modules and to the creation of a service platform that could allow flexibility and renewal of both the offer on the territory and the internal organization. The work also produced additional cues about the actual needs of the cooperative.

The general reaction of Stranaidea to the results seemed positive. Many service managers showed a real interest and an explicit desire for change, even though the rationalization which led to the decrease of the number of sectors hasn't been clear for everyone, together with the ways in which this rationalization could be fitted in the existing organization.

Some work remains to be done in order to pigeon-hole the presented results inside



### 3.5 Impact on the organization

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such a consolidated organization. The changes to deal with require a clear action plan, that should identify priorities, taking into account the most impacted sectors. In order to achieve so and to stimulate a strong sense of belonging in Stranaidea's people it will be necessary to include them in the change process. This could be done through a series of workshops that would foster the understanding and acceptance of the proposals through a bottom - up approach. Working through a bottom - up approach, though, does not mean moving to an elective mechanism with regard to who has to cover the new functions, which remains a prerogative of management, but building new instruments and practices together with Stranaidea's employees, so that nothing will be perceived as an imposition. Hence, once management will have individuated the figures to which assign the new roles inside the cooperative it will step aside to make room to these employees for what concerns the integration of new tools and methods (consistent with the platform) in the cooperative's culture and practices.

Moreover, it is desirable that the applied methodologies (namely the SMF and the adjacency matrices) are recognized as tools to be re-used in the future decision making. In particular, the SMF has not been used to its full potential; the application of specific actions, methodologies or entire services in more than one sector could be carried out by relaxing the constraints applied to the function and switch from the simplified version (eq. 3.1) to the complete one (eq. 2.2).

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