



Designing as a competence: design process as the result of a "learning by interacting" practice. Evidence from Italy

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Introduction

The transformation of productive organizations and of social and cognitive models, linked to the fordist production paradigm, highlights the need to understand the role played by project actions in the reconfiguration of the product-service system. This paper attempts to focus on the Italian case and on the unusual relationship existing between the social, cultural and economic organisation of its Local Production Systems (LPS), as well as the design processes which derive from it (as emerged from the research project entitled "Sistema Design Italia. Project resources and economic system. The role of industrial design in product innovation. Development of the Italian system's local and global market project resources.").

The fundamental catalyst for a design driven recombination of the production system is the unusual process of translating local expertise, both in its tacit and explicit forms, into structures and actions linked to design, through a process of social interaction between the significant actors of specific arenas (Wigren, 1999). This type of knowledge creation generates an evolving, situated path for production and knowledge systems linked with design, therefore de facto constituting a learning-by-doing situation, localised in time and space.

Our initial point of view considers knowledge 1 and its design related activation and translation, as a fundamental process for constructing a competitive economic system based on the knowledge of local actors. In fact, even though the potential of the Italian economic system's production is comparable to that obtainable through a fordist production method, it is mainly made up of small and medium sized business communities whose history and organisation allow them to activate and develop, based on the wealth of their relationships and resources, an ensemble of distinct expertise which forms the base of their competitive advantage.

This structural and organisational method is also of particular interest to the typical systematic business configurations based on territorial production (i.e. LPS) which, having a strong background of distinct cultural, territorial and social knowledge, have been able to supply goods and services based on learning-by-doing, selected and developed by systems of learning-by-using.

Situated actions, situated learning

The theory of situated action 2 (Suchman, 1987) explains how execution of the action strongly depends on its material and social circumstances.

Based on this theory, the significance we can give to the action can be simultaneously developed in both the physical and social worlds, i.e. in a shared cognitive environment with common rules, which is also a physical environment, organised and transformed around artefact systems and the actions which produce and reproduce them.

The Italian case, which is examined in this paper, describes the existence of localised learning, based on groups of individual learning, connected with actions which are transformed into collective learning through a process of social and communicative interaction. At first, collective learning is channelled through the system of interpersonal relationships, which is made stronger through the materialisation of social/cultural structures and practices and of productive artefacts and structures (product-systems and business systems). This process defines what we call context.

This type of learning, therefore, becomes a binding element (i.e. it selects a series of potential action opportunities) and also an enabler (i.e. it activates the relationships between relevant actors and the action opportunities present therein). The context of learning within our example case (i.e. Italian LPS with a strong design component) almost always coincides with a defined physical location and with precise cognitive methods. In fact, the existence of a fundamental space for learning (the arena concept: Wigren, 1999) emerges more and more from the intersection of these two plans.

It is also fundamental for the construction of another stronghold of our discussion: that of an industrial district's identity.

For this reason we believe that the actions of design within the productive and social/cultural system of an LPS should be analysed, both as the result of a project and as an action which is being continuously redefined, based on the changes induced by collective learning processes of the previously defined context.

The social actors who represent the propelling strength of design actions (in their tacit or explicit forms) are also those who are somehow involved in the learning process, spread across the territory, which occurs through territorial entrepreneurial actions, by key social, economical and institutional agents. In this way, these agents initiate the process of learning by interacting mentioned in the paper's title.

These agents, therefore, are the carriers of potential action opportunities and resources within situated frames, inside of which, project resources may be viewed more as activators for connecting more opportunities than those defined in our context, than as guide plans for realising the action.

From our point of view, therefore, we could almost describe design actions as the activators of the integration of territorial, cognitive and action elements of context and of the system of interaction between the context's significant agents.

Essentially, one can translate this point using a model, which views the process of learning by interacting as the starting point for developing various potential innovation paths, as a result of a negotiated interaction process between significant actors, linked with the situated-frame binding system.

In this way, the model we recommend overtakes the simple learning by doing model. Local knowledge production processes are tied strongly to the social frame's configuration processes. That is why we refer the historical stock of expertise, deposited in knowledge and in territorial interaction processes, to the basic relationship system that ensures the transfer and reproduction of languages and codes (even formal ones), which are essential for transferring and disseminating knowledge.

An important case of situated collective learning: the Italian Local Productive Systems (LPS)

Beccattini suggests (Porter, 1990; Piore and Sabel, 1995, Beccattini, 1998) that the Italian productive system is historically characterised by the competitive advantage of its industrial production system. This is based on territorial 3 systems of small and medium enterprises, which are particularly strong in so called light sectors (such as textiles, clothing, footwear, furniture, tiles, etc.) or in niches of instrumental goods (such as utensil machinery, packaging machinery, etc.). By analysing these advantages, he concludes that they reveal a common logic, based on technological and merchandise peculiarities, which unites the above-mentioned types of consumer goods.

The Italian solution to the technological 4 innovation problem is generally represented by a particular configuration of the economic/productive system, which joins the extensive offer of product-systems 5 with the training and development of particular product and project expertise (dispersed within historically deposited practices).

The catalyst element of this system is the attention which communities of SME pay to the needs (including niche needs) of the final users of the goods, who become the reference points for defining innovation.

This process defines and finalises the product-systems, who are the carriers of small, local innovation clusters. This feeds the cultural and social interaction processes, which are mediated both by the products themselves and by the actions and processes employed in their production. The final result is a production and circulation circuit relative to project, production, distribution and communication knowledge, expressed in their explicit and tacit forms.

Our first hypothesis, based on a theory by Beccattini, is the existence of a selective demand matrix, confronted with strong local expertise 6.

This type of innovation is characterised by neither technology push nor market pull dynamics. Instead, it demonstrates a great understanding of new expected user profiles and of the product-systems which achieve them.

For this reason, we can confirm that the characteristic Italian feature, relative to the interaction between a business and its reference environment (i.e. its final user, the market), is the fact that territory (a productive system's common social and cognitive space) binds and configures cooperative production processes for new knowledge. It expresses the demand for a good/service, and at the same time configures the instruments and processes which satisfy that demand, based on history and on experience.

Italian LPSs with strong design components represent a valid example of the efficient realisation of tacit and explicit knowledge-conversion mechanisms (Polanyi, 1967) within the types of organisations described by Nonaka and Takeuchi (Nonaka and Takeuchi, 1997; Reinmoller, 1999).

The types of expertise they display are pragmatic rather than abstract. In other words, they are directed towards defining the conditions and situations relative to the possibility of action (Suchman, 1987). Knowledge, therefore, is increased through both cumulative and recombining dynamics, i.e. by integrating the processes of interaction between the actors involved. The ability of the LPS businesses to act efficiently is, therefore, based on an activation process involving all four phases of the spiral which, according to Nonaka e Takeuchi, describes the process for creating new knowledge through the interaction of internal and external actors.

This innovation derives from the concept of embeddedness, i.e. from interpreting human activities as the inextricable result of their relationship with social and cultural contexts. Therefore, the only way to study this type of innovation is to study the location (either physical or social) in which it is developed: in this case, the LPS.

One must, therefore, study the context setting. The best way to do this is with an ethnographical approach, which takes account of a complex and structured network of social relationships.

Research on Sistema Design Italia:

cases of successful innovation of product-systems and design-driven businesses, as an example of situated, collective learning within LPS

We share Rullani (Rullani, 1998) idea that the deciding factors for determining an LPS's development opportunities are linked to processes of production, circulation, transformation and knowledge-use.

As Sebastiano Brusco (Brusco, 1997) states, there are two interacting types of knowledge: coded knowledge, which forms and exchanges itself within language and within scientific and technical domains, and local knowledge, built on practice and on experience.

However, we are not interested in these two abstract definitions. We are interested in the relationship structures which turn tacit knowledge into explicit knowledge, in a concrete dimension of historical development.

It isn't clear, in fact, how one can generate a linear model for social/economic development from either of the two knowledge types defined above.

The reason for the success of some LPSs can, therefore, be found in their historical relationships with actors, institutions, languages and resources which, by bringing

themselves in line with various universal knowledge and development policies, have determined their specific characteristics.

This means that an LPS's main functional characteristic is that of integrating the two forms of knowledge production described above.

The study of design, as an element that structures the innovation processes of Italy's economic/productive system, had never been systematically investigated until the Milan Polytechnic Faculty of Industrial Design started a national research project in 1998, entitled "Sistema Design Italia. Project resources and economic system. The role of industrial design in product innovation. Development of local and global market project resources of the Italian system".

This two-year project has strongly revealed the particular relation between design action and Italian social, cultural and economic organisation.

The research project's particular standpoint is a bottom up investigation strategy, based on the analysis of Italian design through case studies regarding product/business-systems in significant territorial contexts.

Through its four main phases, the research project has devised an original thought process: it has determined a wide-ranged view of the relationship between social/productive systems, configured around a territorial basis, and the Sistema Design Italia (SDI) with all its characteristics and its complex cultural configuration. These phases are organised as follows:

- collective discussion of the method's premises and of the research project's investigation methods and instruments;
- consolidation of the research project's conceptual and operational structure, creating the basis for identifying and efficiently carrying out case studies;
- preliminary analysis of the territorial systems, within which the case studies are conducted which includes:
 - a summary socio-economic analysis by area/sector, highlighting their particular characteristics and evolutionary dynamics;
 - a focused analysis of the more relevant industrial design aspects: for territorial research, the analysis of a series of relevant territorial characteristics (business systems, key products, production processes and their articulation, articulation of project activities, etc.); for sector research, the nature of the products, their composition, the main production processes and their articulation, the articulation of project activities, etc.;
 - a survey of clear design activities (design houses and associations, schools, cultural centres, museums, editorial activities, etc.);
 - selection and subsequent carrying out of significant case studies through a original, purpose-made research format, prepared by the research network SDI.

In this way, a stock of information and examples of concrete design resource-uses have been assembled. It is the first attempt to create a analytical and conceptual model of Italian design and of the phenomena linked with it.

The research project was a field research carried out (in line with general empirical research) through the use of case studies. The SDI research network has used case studies with two objectives in mind: on the one hand, to describe a phenomenon which, though talked about, has never been properly explained (except in various, overly directed econometric attempts at analysing the commercial results of made-in-Italy products); on

the other hand to understand the relationship mechanisms between design actions and local productive systems.

The variety of the case studies examined has highlighted a clear and common feature: there exists a strict correlation between design culture and production culture (i.e. the culture of different territorial practices and experiences, which demonstrate the constant presence of the collective, situated learning method we defined as learning by interacting).

This confirms the existence of a collective learning process; it involves a great number of actors in a defined arena in which each actor collaborates actively, bringing his or her own expertise relative to the social process of the co-production of supply value, which, in turn, adds value to one or more specific user systems⁷. During the collective process of value co-production (Manzini, 1999), each actor tends to realise a specific project component, determined by his/her technical ability but also by his/her specific sense-horizon.

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Endnotes

1 Enzo Rullani (1998: 12) maintains that economic value, within late capitalist production methods, is born from "the use of information, understood as either the subjective (tacit or explicit) expertise of the actors, or the useful relationships which are inscribed objectively within a context or a code"

2 Born from social sciences and, in particular, from a branch of anthropology called ethnomethodology.

3 Local Productive Systems can be analysed according to their particular organisational characteristics. The following are some of the reasons for this:

- the presence and availability of particular resources (fundamental raw materials for implementing a particular productive process - e.g. Marble in Carrara);

- the presence of particular abilities and expertise, developed from pre-existing local productive sectors e.g. the high concentration of ceramics factories in Civita Castellana is due to the expertise previously developed by woodworks factories);

- the presence of local market niches, resulting in specialised productions (e.g. mountain boots in Montebelluna);

- the technological convergence of local historical production sectors.

A part from geographical location, defined and motivated by particular context characteristics, local production also depends on its business population (Pyke, Beccatini and Sengerberger, 1991). This consists of businesses of equal importance specialising in one or more specialised phases of production of a particular good.

The LPS represent a possible method of expressing the Italian economy's vocation to organise itself in local systems that generate productive specialisation areas. In the abundant literature, which turned the industrial districts into empirical case studies even before becoming theoretical elaboration and modelling studies, we can see that there is a tendency to associate their internal production methods with so called traditional or mature technology sectors (i.e. those sectors which are characterised by low technology levels or modest innovation dynamics).

In actual fact, the recent debate, which was launched with the rediscovery of the competitive role of small businesses, has identified different types of territorial productive cases, both on the basis of their technological complexity and of the complex relationship between businesses and productive sectors in these areas.

4 It is true to say that, even on a historical/structural level, the Italian innovation system represents a case of structural and cognitive lock in. Starting from its categorisation, within a classificatory view of innovation phenomena, it could be said that its structural closure has resulted in its transformation from a system of advanced scientific/technical expertise into a system of advanced transformation-process expertise. From this standpoint, an analysis of the number and type of patents held or used by the LPS and of the links with global training and consulting systems, should further confirm these hypotheses.

The innovative dynamism of Italian businesses and of their design system is not linked so much to radical innovations, which could be quantified in terms of the number of patents developed, research and sustained development costs, etc. It is mainly noticeable in sectors of increasing innovative value (reconfiguration of a business' interface with its reference market). In this case, importance is given to the particular product/service types, thanks to which Sistema Design Italia can boast a leading position. However, one cannot talk about Italian success relative to today's key sectors for economic development, such as telecommunications, transport, information technology and biotechnology.

5 The system-product is a combination of concrete elements (a business' institutional communication, its advertisement, its products, its sale locations, the characteristics of its offices and factories, etc.) and intangible elements (brand perception, interpersonal relationships with service providers, product status, sharing of value, etc.) which require the continued interaction between producer (performer) and client (user) for the co-production of value (Normann and Ramirez, 1994; Manzini, 1999).

Borja de Mozota (Borja de Mozota, 1990) speaks about the system-product concept as of a link to the theories of formal configuration perception (Gestalt) and to the particular relationship between individual form and fund: the French scholar always sees the product's form through an appropriate background context. The individual form is, therefore, complete because it's given meaning by the relationships with its background elements, i.e. the business, the market and society : "the interdependence between individual form and fund is very clear. Until a new form has the desired commercial impact, one must give it an identity (...) not only for the product's form and elements, such as packaging and advertisement, but also for the salespeople's commercial documents, for

presentation furniture and for post-sale communication and services." (Borja de Mozota, 1990: 191).

6 Historically selected by learning processes.

7 Going from business to business to business to consumer.

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