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Creating trust between local and global systems



**CREATING TRUST BETWEEN LOCAL AND GLOBAL
SYSTEMS**

**HET CREËREN VAN VERTROUWEN TUSSEN
LOKALE EN GLOBALE SYSTEMEN**

Thesis

**to obtain the degree of Doctor from the
Erasmus University Rotterdam
by command of the
Rector Magnificus**

Prof.dr.ir. J.H. van Bommel

and according to the decision of the Doctorate Board.

The public defence shall be held on

Thursday October 10Th 2002 at 11.00 hrs

by

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Erasmus Research Institute of Management (ERIM)
Erasmus University Rotterdam
Internet: <http://www.irim.eur.nl>

ERIM Ph.D. Series Research in Management 18

ISBN 90 – 5892 – 031 – 3

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“Ci sono giorni in cui ogni cosa che vedo mi sembra carica di significati: messaggi che mi sembra difficile comunicare ad altri, definire, tradurre in parole, ma che appunto perciò mi si presentano come decisivi. Sono annunci o presagi che riguardano me e il mondo insieme: e di me non gli avvenimenti esteriori dell’esistenza ma ciò che accade dentro, nel fondo; e del mondo non qualche fatto particolare ma il modo d’essere generale di tutto. Comprenderete dunque la mia difficoltà a parlarne, se non per accenni”

(Italo Calvino, *Se una notte d’inverno un viaggiatore*)

“There are days in which everything that I see seems to me full of meanings: messages that seem to me difficult to communicate to others, define, translate into words, but, just for this reason, they are to me decisive. They are announcements or presages that concern me and the world together: and about me not the exterior events of the existence but what happens inside, in my deepest part; and about the world not some particular events but the essence of the whole. Therefore, you will understand my difficulty to speak about them, if not only for hints”

(Italo Calvino, *Se una notte d’inverno un viaggiatore*)

ACKNOWLEDGMENTS

A thesis is never the result of the work of a single person, but it requires the contribution of many others. Some of them provide you with comments, suggestions and insights that are directly relevant to your work. Others contribute to create that peculiar social atmosphere, which is required to accomplish the task of writing a dissertation. This thesis, of course, is not an exception. Therefore, I would like to dedicate a few lines to thank all the persons that have contributed to the accomplishment of this work.

I am deeply grateful to my two supervisors Kuldeep Kumar and Ron Lee, who have stimulated and encouraged me for all these years. Without their guidance, the finalization of this thesis would not have been possible.

My gratitude goes also to the members of the committee for their careful reading of the thesis. Their suggestions and comments have been of great help to further improving the quality of this thesis.

I would also like to thank Luciano Pilotti, who has encouraged me to do the Ph.D. and has been always present in all these years.

Special thank goes to current and past members of EURIDIS, Vakgroep 1 and ERIM, who have made my staying in the Netherlands pleasant. In particular, I would like to thank Yao-Hua Tan, for the numerous discussions on the issue of trust and the content of my dissertation. Manfred Zeilinsky, for introducing me to the world of Apple computer and open source communities. I hope he can also forgive me for my switching back to PC. Life is still too difficult for non-PC users out of Euridis. Finally, I would like to thank the staff of EURIDIS, ERIM and Vokgroup 1. I know that it is difficult to make order out of my disorder and aversion to bureaucracy.

I would like to thank also the other Ph.D. students of the ERIM program, who started this adventure with me. A particular thank goes to Dolores and Moritz for their friendship.

A special thank goes to Sivia, Paolo, and Marcel, who have been my family here in the Netherlands.

I would also like to thank the initial “house citizen” of 1st Jerichostraat - Andreas and Ilaria - who introduced me to the Dutch lifestyle.

Finally, my thanks go to my Italian friends, who has made flight companies and petrol stations rich with their several travels between Venice and Rotterdam; my family, who respected my choice to study far from home, but remained close to me in each step of this journey; Beatrice, who arrived late, as usual, but did not save any love to herself to make the end of this research project possible.

TABLE OF CONTENTS

<i>Acknowledgments</i>	5
<i>Table of Contents</i>	7
Part I	11
<i>Theoretical Analysis</i>	11
<i>The process of trust creation between local and global systems</i>	11
1 The problem of sustaining the creation of trust between local and global systems	13
1.1 Two instances of the problem of trust creation between local and global systems	17
1.1.1 The case of Sprintel in the textile district of Prato	17
1.1.2 The case of electronic trading in the London insurance market	20
1.2 Definitions and perspective proposed	23
1.2.1 Local and global systems	23
1.2.2 Trust creation	26
1.2.3 Sustainability	27
1.3 Research approach	29
1.3.1 Qualitative versus quantitative research methods	29
1.3.2 Alternative qualitative approaches: positivist, interpretative and critical	31
1.3.3 Conducting interpretative research	32
1.4 Conclusion	37
2 Trust, Information and communication technologies: a review of the literature	39
2.1 The under-socialized perspective	40
2.1.1 Self-interest seeking rationality	40
2.1.2 Trust as rational choice	43
2.2 The over-socialized perspective	48
2.2.1 Behavioral rationality	48
2.2.2 Trust as social capital	50
2.3 The embedded perspective	55
2.3.1 The concept of network rationality	57
2.3.2 Trust in the embedded perspective	60
2.4 The role of information and communication technologies in supporting the development of trust	63
2.4.1 The under-socialized perspective	64
2.4.2 The over-socialized perspective	67
2.4.3 Embedded perspective	69

2.5	Trust media in open electronic commerce	72
2.5.1	Trust at the data level	72
2.5.2	Trust at the business level	75
2.6	Conclusion	77
3	<i>The process of trust creation: theory development</i>	81
3.1	The process of knowledge creation	82
3.2	The model of trust creation	87
3.3	Governing trust between local and global systems	90
3.4	Conclusion	92
<i>Part II</i>		95
<i>Empirical Analysis</i>		95
<i>The creation of trust between local and global systems: the case of italian industrial districts</i>		95
4	<i>The creation of trust between local and global systems: Introduction to the empirical analysis</i>	97
5	<i>The local creation of trust</i>	101
5.1	The concept of industrial districts	101
5.2	The foundation of trust within industrial districts	104
5.3	The socialization and internalization of trust within industrial districts	105
5.4	Conclusion	107
6	<i>The de-coupling model of trust creation</i>	109
6.1	The case of Benetton	111
6.1.1	The global network	111
6.1.2	The local network	113
6.1.3	The role of information and communication technologies	113
6.1.4	Discussion	114
6.2	The eyewear district of Cadore	114
6.2.1	The business model of the leader	116
6.2.2	The disruption of trust within the district	117
6.2.3	Discussion	118
6.3	Conclusion	119
7	<i>The Coupling model of trust creation</i>	121
7.1	The crystal pipe	122
7.2	The crystal pipe in Fiat	123

7.2.1	Internal reorganization: lean production within Fiat	123
7.2.2	Supply chain reorganization	125
7.2.3	The reorganization of the commercial chain	128
7.3	Toward a global supply chain?	129
7.4	Conclusion	130
8	<i>The Loosely coupling model of trust creation</i>	133
8.1	The industrial district of packaging	134
8.2	The case of the footwear district of the Riviera del Brenta	138
8.3	Conclusion	141
9	<i>Conclusion and future research directions</i>	143
	<i>BIBLIOGRAPHY</i>	153
10	<i>Summary in English</i>	163
11	<i>Summary in Dutch</i>	167
	<i>Curriculum Vitae</i>	171

PART I

THEORETICAL ANALYSIS

**THE PROCESS OF TRUST CREATION BETWEEN LOCAL
AND GLOBAL SYSTEMS**

1 THE PROBLEM OF SUSTAINING THE CREATION OF TRUST BETWEEN LOCAL AND GLOBAL SYSTEMS

Giddens (1990) argues that the development of modernity have been characterized by the progressive time-space distancing of social activities. This does not simply mean that social activities take place between parties located into physically distant places, but also that local interactions are ever more mediated by non-local factors. For instance, paying by credit card involves a third party, the credit card system, which is not a local interaction between the customer and the shopkeeper.

The origin of this time-space distancing process can be traced back, according to Giddens, to two major factors or innovations that have characterized the development of the modern society. The first is the invention of the mechanic clock, which has provide a common standard to measure time.¹ It should be noted, however, that the standardization of time across regions, with the introduction of a global calendar and a global system of time zones, is only an innovation of the last century. The major consequence of the global standardization of time is the separation between time and place. Time does not depend anymore on the place, but it is defined with respect to a global benchmark (Greenwich). The global standardization of time enables the coordination of activities between time zones.

¹ It should be noted that the standardization of time is a precondition for the industrialization of production activities. The tyloist model of production, for instance, is based on the standardization of time and motion.

The second aspect that has contributed to expanding of the social capacity to coordinate activities across time and space has been the standardization of space. The origin of this process can be traced back to the invention of topography. The development of topography, in fact, has enabled us to represent space independently from the place. A topographic map does not have perspective. It represents space independently from the location of the observer. This enables, for instance, two individuals to set up a meeting and to locate a place in a city that they both do not know.

Giddens, from this perspective, argues that the terms space and place are often used interchangeably. However, they have a different meaning. The term space refers to the physical dimension of social interaction instead the term place refers to the social setting where social interaction is embedded. In the traditional society, place and space coincide, as long as social interaction takes place mainly between co-located parties.² The development of modernity has been characterized by the progressive separation between these two dimensions. This does not simply mean, as we explained above, that social interaction takes place at a distance, but also that local interaction is ever more mediated by non-local factors.³

The progressive time-space distancing, which has characterized the development of modern society, has required the invention of new “social infrastructures” to integrate social activities across time and space, which Giddens calls disembedding mechanisms. These mechanisms, according to Giddens, remove social relations from the immediacies of context and re-construct them into an artificial or virtual context. Giddens distinguishes between two categories of disembedding mechanisms: *symbolic tokens* and *expert system*.

Giddens defines symbolic tokens as a “media of interchange which can be passed around without regard to the specific characteristics of individuals or groups that handle them at any particular juncture (pg. 22)”. Giddens, in order to characterize the concept of symbolic tokens, refers to the example of money. Money is a symbol, a piece of information, whose value is guaranteed by a *trusted* third party, the national-state. The value of money “permits the exchange of anything for anything, regardless of whether the

² Co-located, as we explained before, does not simply mean that they are physically close (same time and same place), but also that their interaction is mediated by local factors, such as a local culture.

goods involved share any substantive qualities in common with one another (Giddens, 1990; pg. 22). The value of money, therefore, enables the coordination between an indefinite number of transactions across time and space.

Expert systems are defined as “systems of technical accomplishment or professional expertise that organize large areas of the material and social environments in which we live today (pg. 27)”. Walsham (2001), in order to characterize Giddens’ notion of expert systems, uses the example of computerized credit-scoring systems, which bank managers use to evaluate applications for loans. The function of these systems is to organize and structure the interaction between the bank manager and the customer needing a loan according to abstract, global and average parameters of reliability. The specific relationship of mutual knowledge, which may exist between the bank manager and the customer, does not play any role in the decision to grant a loan. The decision to grant a loan is taken by a third “party”, which is not local to the relation between the manager and the customer. Giddens, however, argues the presence of expert systems in day-to-day life is more pervasive than the example in itself suggests. He argues that when we are driving a car we are embedded into an expert system. We know very little about how cars work, but we place our trust in the expert system of auto-engineers, designers, workers and robots -, which have produced the vehicle.

Giddens argues that the problem of trust in modern society is the problem of creating a dynamic and evolutionary link between local and global/abstract systems of trust. He uses two terms to characterize this problem: disembedding and reembedding. Disembedding, as we already explained, is the process through which social relations are exported from the immediacy of context and imported within abstract and virtual systems of trust. Reembedding, on the contrary, is the process through which disembedded social relations are exported from abstract systems of trust and re-imported in the intimacy and immediacy of local contexts. In other words, these are the two processes through which faceless commitments are translated into faceworking commitments and vice versa. Faceless commitments concern trust in symbolic tokens or expert systems (abstract systems). Faceworking commitments, instead, concern trusted relations established and developed in condition of intimacy and immediacy (co-presence).

³ In the next section we present two case studies of the local adoption of global systems of trust. Therefore,

Giddens, from this perspective, argues “my overall thesis is that disembodied mechanisms or abstract system interact with reembedded context of action, which may act either to support them or undermine them; and that faceless commitments are similarly linked in an ambiguous way with those demanding facework (pg. 80)”. A key role, according to Giddens, in sustaining the creation of trust between these systems is played by the access points of abstract systems. It is in these points, in fact, that the interaction between local experiences of trust and abstract commitments take place and merge with one another.

The main objective of this thesis is to explore the problem of sustaining the creation of trust between local and global systems of trust. Our use of the term sustainable, as we shall see in this chapter, emphasizes the need to define a dynamic equilibrium between these two dimensions of social interaction and trust creation. The solution to this problem is not given by the progressive standardization of trust across cultures and social contexts, but by stimulating the cross-fertilization of trust between cultures and communities. The different forms of trust and social relations that characterize different cultures and societies/communities around the world represents a value for contemporary society, even only for the fact that the costs of local trust creation are already embedded in the history and tradition of local systems. The solution to this problem requires defining appropriate forms of mediation to make these two dimensions of trust creation compatible. In other words, we need to identify the solutions that enable the two systems, local and global, to learn from each other however allowing them to maintain their own identity.

The aim of this chapter is twofold. The first is to further explore the problem of trust creation. From this perspective, in the following section, we discuss two case studies of local systems that have failed to convert to the codification of trust. In section 1.2 we define the terms of the problem: we characterize the distinction between local and global, we address the concept of trust creation and we define the meaning of sustainable.

Once we have defined the problem, in section 1.3 we address the research approach. From this perspective we have chosen an interpretative approach. This approach belongs to the family of qualitative research. Therefore, we explain why we decide to apply a qualitative approach rather than a quantitative one. Furthermore, we also explain

interaction takes mainly place between local people. However, it is mediated by non-local rules.

why we choose an interpretative approach rather than other qualitative approaches available.

1.1 Two instances of the problem of trust creation between local and global systems

The previous section briefly introduced the problem of trust creation between local and global places. This section proposes two case studies, which emphasize the problem of integrating a local culture within a codified system of trust. These two case studies are taken from the literature. They focus on the failure of two computerized systems designed to support cooperation not only between local firms, which belong to the community, but also with their external partners and competitors. The aim of this section is twofold. The first is to characterize the problem of sustaining the creation of trust between local and global systems. The second is to show that this problem is not confined within a specific culture.

1.1.1 The case of Sprintel in the textile district of Prato

The case of Sprintel, an inter-organizational information system for the industrial district of Prato, is a cornerstone of the literature on the role of IS in the virtual organization (Malone et.al, 1987; Johnston and Lawrence, 1988; Johnston and Vitale, 1988). The initial success of Sprintel has been highlighted to show the competitive role of IS within networks of firms (Malone et.al, 1987; Johnston and Lawrence, 1988; Johnston and Vitale, 1988). Kumar et.al. (1998), instead, investigates the consequent failure of Sprintel to highlight how the utility of the system is influenced by the specific relationships of mutual trust between the members of a community.

An industrial district is a peculiar model of production based on the flexible integration between a large number of small- and medium-sized firms that are spatially clustered within a specific geographic area.⁴ The main characteristic of this model is that firms are flexibly integrated on the basis of mutual trust rather than contracts. The production of trust in these communities is based on the combination of two factors: culture and reputation. The common culture shared between the members of the

⁴ See section 5.1.

community defines a common initial base of cooperation between firms. The value of this common culture is integrated with individual investments in reputation and mutual trust. The closed nature of this community, in fact, stimulates the repetitiveness of the transactions between a small numbers of players.⁵

The district of Prato is one of the many districts that characterize the industrial backbone of the North East and Central part of Italy, the so-called Third Italy. It is situated in Tuscany, 20 miles East of Florence (Tuscany). It specializes in the manufacture of wool. The origin of this specialization can be traced back to the Middle Ages. In the eighties one third of the world production of wool was manufactured in Prato and over 50% of it was exported. In 1986 the district contained almost 15,000 firms with an average of four employers.

The structure of the district is characterized by the distinction between commercial firms (*impannatori*) and production firms (Becattini, 1987; Johnston and Lawrence, 1988; Inzerilli, 1990; Casson and Pannicia, 1995; Dei Ottanti, 1995). The *impannatori* are the modern version of the medieval merchant. They specialize in the marketing of the local production capacity. The second, instead, are suppliers of production capacity. The *impannatori* contract out a large part of their production to local networks of subcontractors. The relationships with these subcontractors are stable and long-term in nature. The aim of Sprintel, from this perspective, was to automate the activities of coordination and control between firms.

The project was financed by a number of public institutions – including the European Commission, ENEA (the state owned network for innovation), the regional and local municipality together with private associations and institutions – such as the local industrial and artisan associations and the local saving bank.

The project was structured in three major phases: feasibility, pilot and then market release. The feasibility study showed that the district was characterized by an intense exchange of information between local firms. Therefore, Sprintel was expected to produce a drastic reduction in the local transaction costs and, indeed, to improve the competitiveness of the community. Therefore, the consortium decided to finance a pilot scheme (September, 1984).

⁵ For a complete treatment of the process of trust creation within industrial district see chapter 5.

The consortia, in order to stimulate the initial adoption, offered the equipment and service free of charge. The pilot scheme started in June 1987 with 300 firms and 450 terminals connected. By the end of the pilot scheme, there were already 500 firms on the waiting list. It was in this phase that scholars from different countries started to refer to the case of Prato emphasizing the competitive role played by IS in sustaining the cooperation between local firms.

The success of the pilot scheme convinced the consortia to move further. In this phase the consortia took two major decisions. The first was to invest in the development of additional services and improving the telecommunication infrastructure. It should be noted that among the new services developed there was the accessibility to national and international databases of customers, which also contain information about their relative reliability. The second was billing the service. The service was billed at around US\$ 6 per month, which was still lower than the marginal cost of providing the service. This second decision was taken mainly as a consequence of the cut in European funds. Thereafter the number of subscribers started to decline, from 500 at the end of the pilot scheme, to 400 in 1992 and 70 in 1993. Despite the attempt made by the Sprintel consortium to revitalize the project, through the development of additional services, in October 1994 the project was formally terminated.

The failure of Sprintel, according to Kumar et.al.(1998), can not be explained by referring to the technical and economic perspectives on IS, which currently dominate the field. This perspective argues that there are three major reasons for the failure of a technology. The first is that it does not serve a valid purpose. However, the conditions in Prato were ideal for the introduction of Sprintel. The diffused nature of the local production system, in fact, should generate high transaction costs. Therefore, Sprintel should have produced a reduction in these costs. The second reason is that the main stakeholders have not adequately sponsored the introduction of Sprintel in the district. However, the main institutional and private leaders in the district have actively participated in the project. Furthermore, no major conflicts have been registered between the main stakeholders. The third factor is that the project has not been adequately financed. However, the project, at least in the initial phase, has benefited from the generous funding by national and international institutions and the local private bank. Furthermore, there are

three other major factors that should have contributed to the success of the project. The first is the attitude of the local entrepreneurs to invest in innovation. The second is the selection of pre-tested technologies, such as Videotext technology, in order to minimize the risk of technological failure. Finally, the Sprintel consortium has strongly invested in users' training to facilitate the adoption and comprehension of the strategic and organizational opportunities attached to the project.

The failure of Sprintel, according to Kumar et.al., is a consequence of the high level of mutual trust shared between the members of the community. The nature of trust within the community is mainly tacit, shared on the basis of common norms and values that are socially and historically inherited. The evaluation of the strategic and organizational impact of Sprintel has been conducted on the basis of transaction cost theory. This theory, as we shall see, is based on the assumption of opportunism as a prevalent characteristic of human nature. Therefore, the costs of transacting in the market are mainly the costs of structuring a control system to monitor transacting parties' mutual behavior. Information and communication technologies reduce the costs of information and control. In the district of Prato, however, trust rather than opportunism is the prevalent characteristic of the community. Therefore, the improved capacity to search and process information had no value for the local firms.

Furthermore, the introduction of an electronic media reduces the need to meet face-to-face. Face-to-face encounters, as we shall see, are the major way of sustaining the process of social creation of trust. Therefore, Sprintel may have had a negative impact on the local mechanisms of trust creation, based on the direct face-to-face interaction between individuals. Sprintel failed because of the lack of consideration about the influence of trust and relationships between individuals on the way firms do business within the community and with their external partners.

1.1.2 The case of electronic trading in the London insurance market

It could be argued that the failure of Sprintel is peculiar to the specific social atmosphere that characterizes the community of Prato. The specific Italian culture, which relies heavily upon personal relationships and face-to face interactions, may have inhibited the adoption of this technology. Furthermore, the nature of the transactions characterizing

the industrial district of Prato may not have been compatible with the adoption of this technology. For instance, the quality of cloth manufacturing is difficult to codify and, therefore, to monitor on the basis of computerized machines and information systems. This second case, however, shows that the problem of sustaining the creation of trust between local and global can be generalized in other contexts. This case, in fact, focuses on the failure of a computerized system to support the placement of insurance coverage in the London insurance market (Barrett 1996; 1999; Walsham, 2001).

The London Insurance Market is an important part of the UK insurance sector, built up around Lloyd's of London. This market includes hundreds of semi-autonomous players. In the late eighties and early nineties, the Market suffered huge losses as a consequence of the combined effect of two major factors: a bad run of natural disasters and increasing global competition. In order to regain its competitiveness, in the early nineties, the Market started a project to develop an electronic trading system. The expected benefits were a reduction of the local transaction costs and an improvement in the quality of the services provided. The introduction of LIMNET (London Insurance Market Network) produced significant improvements in a number of working areas, such as claims' management, settlement and accounting. However, it failed within a strategic area of the market, namely the placement of insurance coverage.

The process of placement is structured as follows. The process is initiated by a client who contacts a local broker to request insurance or reinsurance coverage. The local broker, in this phase, investigates the details of the risk and collects the relevant information to conclude the negotiation. In the second phase the broker negotiates with a "lead" underwriter, who defines the legal and financial terms and conditions of the policy. Usually, the risks placed in this market are complex. Therefore, it is necessary to spread the risk between several "following" underwriters, who subscribe to part of the risk placed by the "lead" underwriter in the market. The negotiation usually takes place in the local market. However, there are cases where "following" underwriters belonging to the global community subscribe to part of the risk.

The traditional placement system was based mainly on face-to-face negotiation. The negotiation between underwriters and brokers took place in the underwriters' office. The brokers carried a file of papers containing the details of the risk instrument. The

negotiations between brokers and underwriters were recorded in this file. The aim of the Electronic Placement System (EPS) was to replace this complex and costly process. In the new system the broker is responsible for inputting an electronic record of the risk, called the common core record, at the start of the placement process. This record is sent to the “lead” underwriter, who adds the terms and conditions for the subscription of the risk, and then transmits it across the network to a number of “following” underwriters. Finally, once the placement has been successfully closed, the data recorded in the electronic document can be used to initiate the subsequent processes, such as accounting.

Walsham (2001) highlights three major reasons for the failure of EPS. The first is the lack of consensus. In networks of semi-autonomous parties the diffusion of common standards and technologies is based on consensus rather than on power. Therefore, EPS failed to achieve the critical level of consensus. The second is the lack of communication richness. Both brokers and underwriters sensed that the “communication bandwidth” was insufficient to sustain negotiations and the development of mutual trust. For instance, brokers argued that through face-to-face negotiations they could better influence the underwriters’ perceptions of the risk to be insured. Furthermore, there were also complaints that the system did not comply with the Lloyd’s rule, Utmost Good Faith, which states that the broker must provide all the relevant information about the client and the risk. From this perspective the argument was that the technology limited the possibility to provide full information about the case.

The third reason is the changes on work practices and worker status induced by the system. The users pointed out the changes that the system imposed on the traditional working practices, which had been developed over three centuries in the London Insurance Market. Furthermore, they were also uneasy about the potential changes imposed on their relative negotiation power. The underwriters feared that the effect of EPS would be to shift the competitive nature of the market from reputation- to price-based. The electronic placement market, for instance, could be accessed by a larger number of underwriters per unit of time. The brokers, on the other hand, feared that the underwriters could use EPS to deal directly with clients.

1.2 Definitions and perspective proposed

In the previous section we addressed two case studies emphasizing the failure of an inter-organizational information system to support cooperation between local firms and between local firms and their clients and suppliers. In both cases the computerized systems had not been able to replace the efficiency of existing local practices of trust. The aim of this section is to develop a conceptualization of the problem of sustaining trust creation between local and global systems. We start by characterizing the distinction between local and global systems. Then, we introduce the concept of trust creation. We conclude with the introduction of the concept of sustainability. This section is only a guideline of concepts and arguments that are developed in the following sections of this thesis. Therefore, these concepts and arguments may not appear fully clear in this phase.

1.2.1 Local and global systems

We can distinguish between two phases that have characterized the development of the concept of space in the economic literature (Rullani, Micelli and Di Maria, 2000). In the first phase space is accounted for simply in terms of transportation costs. Therefore, the localization of the firms depends mainly on the distance from the markets of supply and distribution. In a second phase the concept of distance has been extended in order to include the transaction costs between firms.⁶ These are the costs of accessing, sharing and enforcing the value of information between firms. The more complex and specific transactions are, the more information tends to be asymmetrically distributed between transacting parties and the more efficient it is to control these transactions directly, that is “face-to-face”.

Therefore, the development of information and communication technologies tends to relax the bond between spatial proximity and the cost of coordination and control between firms. Information and communication technologies have already internalized most of the competences and procedures required to integrate activities between places. Procurement systems, for instance, embed all the knowledge required to select new suppliers, and coordinate and control their performance over distance. Therefore, being physically close does not produce any more advantages in terms of searching, coordination

⁶ See next chapter for a review of transaction cost theory.

and control costs. Firms are footloose. They move to exploit local and temporary cost-advantages, such as low labor costs and fiscal incentives.

However, measuring distance in terms of costs of sharing information between transacting parties has a major disadvantage. It does not take into account the costs of creating and understanding the meaning of that information. The existence of a piece of information is taken for granted. The major problem is to localize it and make sure that it is shared between transacting parties. Transacting parties negotiate common procedures to share information, but they do not negotiate the meaning of that information.

A more accurate way of measuring distance is based on the costs of creating and sharing knowledge (Becattini and Rullani, 1993; Rullani, 1995). From this perspective information, which is knowledge that can be transferred in words and numbers, is only a small part of what we know (Polanyi, 1962; Nonaka and Takeuchi, 1995). Most of the knowledge is embedded within our daily experience of the world. Polanyi (1962) uses respectively the term explicit or codified and tacit to characterize the distinction between these two dimensions of knowledge. Codified knowledge can be expressed and transmitted into formal and systematic languages. The meaning of codified knowledge is self-contained within their logical frameworks, which has been constructed to transfer it. A production machine, for instance, is the framework/infrastructure, which is used to transfer the engineer's knowledge about a specific production process.

Tacit knowledge refers to specific mental or physical skills and competences, which have been developed on the basis of training and experience, such as a sprinter running 100 meters in less than ten seconds. This knowledge is not easy to replicate or reproduce. Reproducing tacit knowledge is a time-consuming activity. Therefore, the value and meaning of tacit knowledge is tied to a single person, a group or a community, in general within a specific context. The experience, which is embedded within routines developed between team-members, is hard to replicate and transfer. Therefore, the value and meaning of that experience is codified only within the relationships between team-members.

The distinction between tacit and codified knowledge is useful to characterize the concept of local and global systems (Becattini and Rullani, 1993). Local is the context of

tacit knowledge. The value of tacit knowledge is codified and, indeed, transferable only within a specific context. It should be noted that local does not necessarily mean physically close. However, physical proximity reduces the cost of sharing experiences between individuals and firms. Therefore, it may facilitate the development of common norms and practices. This is not always the case. The physical proximity between Israelis and Palestinians has not stimulated the socialization of common experience; on the contrary it has been a ground for the development of conflicts between these two cultures.

Global is the context of codified knowledge. The value and the meaning of codified knowledge can easily be reproduced from place to place. For instance, the knowledge that is contained within a software program can be transferred from computer to computer, independent on the specific localization of the computer and the specific experience of the user. Computers, without any human intervention, can elaborate the knowledge contained in an EDI⁷ document, which is formatted according to an international standard. On the other hand, the knowledge that is contained in an e-mail is only partially codified. Its interpretation requires human intervention and experience. It is the reader that covers the gap between written knowledge, which is contained in the document, and contextual knowledge, which is embedded in the context. Therefore, codified knowledge is characterized by different degrees of codification and globalization. There is only a small part of knowledge that is global, which means that its meaning and value is completely independent from the specific characteristics of the context.

The aim of this thesis is to show that trust can also be divided into tacit and explicit. Therefore, it is possible to distinguish between trust as a local resource and trust as a global resource. In order to achieve this aim in chapter two we develop a review of the literature on the basis of a categorization proposed by Granovetter (1985; 1992). This categorization distinguishes between three perspectives of trust: under-socialized, over-socialized and embedded. The aim is to show that in the under-socialized perspective trust is mainly codified. In the other two categories trust is tacit and they differ mainly in terms of degree of explicitness.

⁷ EDI stands for Electronic Data Interchange. This a technology/standard used to exchange commercial documents between firms in an electronic format.

1.2.2 Trust creation

We derive the concept of trust creation from the theory of knowledge creation developed by Nonaka and his group (Nonaka, 1993; Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998). This theory is based on the idea that knowledge is not simply learned, but socially created. In the theory of learning, knowledge is developed through a process of trial and error. From this perspective knowledge is created in two phases: codification and testing. In the first phase, codification, knowledge is codified on the basis of a set of hypotheses about its possible meanings and uses. For instance, a product engineer, in order to develop a product, has to make a number of hypotheses about clients' needs. In the second phase, testing, the quality of the representation is tested against reality. For instance, the correspondence of the product to the consumers' needs is tested only *ex-post*, once the product has already been produced and released to the market. If the product receives a good response in the market, it means that our engineers have been able to interpret correctly the needs of our clients. If the product does not receive a good response, we learn that our interpretation of the consumers' needs was incorrect. Therefore, we exclude only one of the hypotheses, but we still do not know what the consumers want.

Nonaka's theory starts from the hypothesis that there is not a unique and objective reality against which it is possible to measure the quality of our representation. Reality is, in itself, a social construction. Therefore, the value of knowledge is not independent from the social context where this knowledge is experienced and embedded. The knowledge codified within a corkscrew makes sense and, therefore, it is valuable only within a context where corks are used to preserve the quality of drinkable liquid. In other contexts the same knowledge may not have any value or advantage.

Therefore, the creation of codified knowledge is stimulated by the interaction between tacit and codified knowledge. Codified knowledge incorporates part of the context (tacit knowledge). For instance, the development of domestic appliances has incorporated part of the experience of being a housewife. However, codified knowledge is also incorporated in the context. It becomes part of the background (Winograd and Flores, 1986). Domestic appliances did not only substitute the housewife, but they have also contributed to changing social structure. Nowadays, the category of housewife does not

make sense anymore. The changes in social structure have also changed the customers' needs, such as domestic appliances that can be controlled and programmed over distance.

Nonaka and Takeuchi, as we shall see in the third chapter, argue that knowledge is created in four phases: socialization, externalization, combination and internalization. In the socialization phase, individuals' experiences are socialized within a context and become shared experiences. In the externalization phase, the meanings of these experiences are negotiated between the members of a group or a community. In this phase, therefore, knowledge that is mainly local, shared within the community, is translated into codified knowledge, which can be transferred outside a community. In the combination phase, the codified knowledge created within a specific context interacts and combines with the codified knowledge created in other contexts. In the final phase, internalization, this combination of knowledge is internalized locally, which changes the basis and structure of social interaction and, therefore, stimulates the development of new experiences.

Our aim is to show that trust is the product of interaction between tacit and codified components. The first are embedded within a specific social and cultural context. The second are engineered within trans-contextual infrastructures and institutions. The aim is to show that trust is initially socialized within a specific community and then negotiated and codified between its members. Codified trust is combined between communities and it embeds new meanings, which are consequently internalized within the specific context. The internalization of codified trust changes the structure of the social context and creates ground for the development of new contextual experiences.

1.2.3 Sustainability

The concept of sustainable development has recently received much attention from economists and politicians. The economic development is sustainable if it is not an end in itself. The economic development is sustainable, if and only if, it can be reproduced over time. The sustainability of the economic development depends on the possibility to reproduce the economic, social and cultural factors that have contributed to that development. The process of industrialization has produced economic development and wealth. However, it is not sustainable. In fact, it has also produced environmental

deterioration and urban decay. Natural resources that were infinite, such as air and water, are becoming scarce and, therefore, liable to taxation.

Researchers, in the field of sustainable development, have mainly confined their interest to the definition of technological, institutional and economical solutions to sustain the reproduction of natural resources. More recently, however, their range of activities has expanded to comprise the reproduction of specific cultural and social resources, which characterize a community. The current process of globalization of markets and firms undermines the environment, defined not only as a collection of natural resources, but also as a collection of specific cultural and social resources.

The drama of September 11th has emphasized all the implications associated with the cultural diversities between countries and populations. However, this is only the last event in a long history of intercultural conflicts between the so-called Western and Eastern cultures. Chomsky (2001) argues that the meaning behind September 11th can not be understood outside of its context, which comprises of colonialism, exploitation of natural resources and labor forces in the Third World by Western multinational companies and so forth. In this work we abstain from investigating this problem any further. However, recent events have made clear to the so-called Western World that globalization based on the rules of the market is not sustainable and it is necessary to define forms of cooperation and collaboration between countries and populations that do not share common norms and values. Globalization does not necessarily mean domination of a single culture over others. Globalization should mean living and cooperating together in mutual respect of diversities.

In the following sections of this work we argue that trust is a cultural value, which is embedded in specific norms, values and experiences of a community. The value of specific practices of mutual trust, which are embedded within the specific social and cultural fabric of a community, is not only a value for the community itself, but for society as a whole. The development of common standards of trust, such as the Euro, should not negate local practices of trust and cooperation, but it should stimulate their integration in a larger society. This thesis has two major purposes. The first is to define which are the major forms of mediation adopted to support the creation of trust between local and global systems. The second is to identify the one that better sustain the creation of trust between these two systems.

1.3 Research approach

The first part of this chapter has been devoted to the characterization and definition of the research problem. The aim of this second part is to characterize the research approach that we have followed in order to investigate this problem. We have chosen an interpretative approach. This approach belongs to the family of qualitative research. Our first task, therefore, is to justify why we have chosen a qualitative rather than a quantitative approach. The second, instead, is to justify our choice to rely on an interpretative method. In the final part of this section we develop an interpretation of the principles that should guide an interpretative researcher. The aim of this final part of the section is to define how our contributions should be evaluated.

1.3.1 Qualitative versus quantitative research methods

Interpretative methods of inquiry belong to the family of qualitative research (Denzin and Lincoln, 1994). The purpose of this section is to justify our choice to rely on qualitative methods rather than quantitative methods of analysis. The structure of this section is as follows: we develop a comparison between qualitative and quantitative methods of analysis, we compare their applicability and usefulness in the case of trust, and, finally, we explain our decision to rely on qualitative rather than quantitative methods of analysis.

Qualitative and quantitative methods of analysis share a common root in the positivistic and post-positivistic tradition. The two differ on the basic assumptions underlying the interpretation of social phenomena. The quantitative tradition emphasizes the objective nature of reality and the measurability of social phenomena. The qualitative tradition, on the contrary, emphasizes the subjective nature of reality. The qualitative tradition focuses mainly on the process through which social meanings are constructed. The work of researchers is to construct the contextual (local) foundations of social meanings. It follows that the quantitative approach aims to discover the existence of global truths, which do not depend on specific social and cultural factors (local factors). The

qualitative approach, instead, aims to reveal local truths and make them understandable and accessible to the others.

These two alternative perspectives about the true nature of the world have major implications on the way researchers from the two different fields conduct research. The first major distinction is the concept of validation. Quantitative methods, coherently with their perspective of reality, emphasize the objective value of a theory. The value of a theory depends on its internal consistency, which is the extent a theory explains the sample of cases selected, and external consistency, which is the extent findings can be generalized to other cases. Furthermore, quantitative methods are based on a set of formal procedures to objectify findings. Qualitative methods, on the contrary, leave higher degrees of freedom on the conduct and evaluation of findings. A good theory is a theory that makes sense within a specific social context. A valuable qualitative theory is based on a sound description of the social context and of the relative social constraints that shape the meaning of specific findings. From this perspective quantitative methods are but one of the methods to enforce truths.

The second major distinction between quantitative and qualitative methodologies is in terms of accountability of individuals' points of view. Both these two perspectives attempt to give an account of the existence of different perspectives in societies. However, they differ in the way they account for these differences. In the quantitative perspective these are synthesized in the form of deviation from the average. Qualitative researchers, on the contrary, believe that the existence of differences can not be reduced to a simple deviation from an average truth. The existence of differences in society is the engine for the construction and evolution of social meanings. A full understanding of the different facets that characterize a specific point of view is required in order to understand its social implications. Understanding individuals' points of view, therefore, requires direct interaction with the subject of that point of view. For this purpose, qualitative researchers have developed specific techniques, such as interview and observation protocols, to collect data and information about societies.

Our position is very pragmatic. We think that the choice between qualitative and quantitative methods is a matter of subject and scope of the research. In our perspective there are two major motivations for relying on a qualitative approach. The first is that trust

can not be measured. Game theorists strongly argue in favor of the measurability of trust. However, the application of their techniques is limited to simple game, based on a large number of assumptions about the nature and character of the social context. The second motivation is that, in our theory, trust is created through the interaction between tacit and explicit components of trust. Capturing the complexity of the social environment, therefore, is a necessary condition to explain how the meaning of trust changes as a consequence of the interaction between local and global contexts and it cannot be reduced to a number of highly artificial assumptions of a game theory kind.

1.3.2 Alternative qualitative approaches: positivist, interpretative and critical

In the previous section we justified our decision to rely on qualitative methods of analysis. Our second purpose in this section is to explain our decision to rely on interpretative methods. Qualitative methods, in fact, can be further categorized into positivistic, interpretative and critical (Orlikowski and Baroundi, 1991). The structure of the section is as follows: we compare the three methodologies and then we justify our reasoning for relying on an interpretative method. It should be noted that we do not address the positivistic tradition because it is largely based on quantitative methodology.

The critical perspective is based on the assumption that reality is historically constructed and it is produced and reproduced by people. This perspective focuses on the identification of social, economic and cultural constraints, conflicts and domination that prevent a society from evolving. The major aim is to identify the negative consequences of these constraints and propose solutions to overcome them.

The interpretative perspective is based on the assumption that reality, either given or socially constructed, can be understood only through social construction, such as language and shared meaning. From a methodological point of view this perspective is based on the principle of a hermeneutic cycle. A full understanding of the concept is addressed in the next section. The basic idea, however, is that our initial understanding of a complex phenomenon shapes our perceptions about the meaning of its single parts and their interrelationships. These perceptions, on the other hand, modify our initial understanding of the phenomenon. Therefore, we come to know better reality through concentric cycles of deduction and abstraction. It follows that interpretative research does

not predefine dependent and independent variables. Doing interpretative research is a process of discovery. Meanings and interpretations are discovered during this process.

In the previous section we justified why a positivistic perspective does not apply to our research. Therefore, we now confine our discussion to the choice between interpretative and critical approaches. The aim of critical research is to criticize the existing *status quo* as negative for society in general. Our purpose is to understand how the interaction between local and global contexts changes the nature and the structure of trust within a community. Our aim, therefore, is to capture the creative nature of the socioeconomic process of trust creation between local and global contexts rather than the negative outcomes of this process, which may be only an output of the research itself. The adoption of an interpretative method of inquiry is indeed more consistent with the objectives of this research than a critical approach.

1.3.3 Conducting interpretative research

In the previous section we justified our decision to rely on an interpretative methodology of inquiry. The aim of this section is to explain and justify the specific methodology that we have implemented to conduct this research. In order to develop our research methodology we rely mainly on the recent contribution of Klein and Myers (1999), which defines seven principles to guide the conduct of interpretative research in the field of Management Information System (MIS). The MIS community gave this article the best MIS quarterly paper award of 1999. The intention of the authors is that these seven principles should not be seen as prescriptive, but as a set of guidelines, which should be interpreted themselves. The purpose of this section is to provide our interpretation of the seven principles.

Hermeneutic cycle: This is the most fundamental principle that should guide interpretative researchers. This is defined as a concentric process of interpretation. The idea behind it is that our understanding of the single parts of a phenomenon and their interaction change our perception of it and, in reverse, our improved understanding of the phenomenon as a whole changes our perception of its components and their interaction. Thus, the capacity to explain social phenomena can be improved through the development of cyclical processes of interpretation, which move from the precursory understanding of

the components to the whole and *vice versa* from the understanding of the whole context back to its single components. The overall process aims to provide a coherent and harmonic interpretation of the components in relation to the whole and of the whole in relation to its components.

The meaning of the sentence “they are playing football” depends on the context of the sentence itself. The meaning of the sentence may change depending on the shape of the ball that the subjects of the sentence (the players) are using. Furthermore, if there is anyone playing football at all the sentence is used metaphorically. Therefore, the capacity to interpret the meaning of the sentence depends on the capacity to interactively construct inferences about the meaning of the sentence in the context and *vice versa* from the context to the sentence.

Three major phases characterize the development of this thesis: theory development, case studies’ development and theory refinement. In the first phase, we develop a specific language to interpret the problem of integrating the local and global process of trust creation. This phase is based on literature review. We focus initially on the literature on trust. We use the categorization proposed by Granovetter (1992) of the trust literature. We choose Granovetter’s categorization because, as opposed to others, it is based on the different assumptions scholars make on the nature of human rationality rather than on the conceptualization of trust in different disciplines and fields. Therefore, the categorization proposed by Granovetter facilitates the integration between contributions from different fields.

The second literature we consider focuses on local production systems. This field has recently been influenced by the literature on knowledge management and specifically the contribution of Nonaka and Takeuchi (1995). The spatial clustering of an industry is mainly explained as a consequence of the superior capacity to process and combine tacit components of knowledge, which are specific to local production systems, and codified knowledge, which is specific to global ones. Our contribution, in this phase, has been to develop a bridge between trust and knowledge and to show that the process of trust creation between local and global contexts can be read as a process of knowledge creation between local and global contexts.

In the second phase, case studies' development, we construct a base to better frame our initial theoretical intuition. Our purpose was to improve understanding of the process of trust creation as a process of knowledge creation between local and global contexts. Being able to draw a theory from case studies is necessary to select case studies that can be compared both for their similarities and differences. The selection of the case studies has taken place in two major phases: short-listing and selection. In order to develop a short-list of the case studies we interviewed scholars, who are recognized experts in the field of Italian local production systems. In these interviews we defined a list of cases characterized by different models of intermediation between local and global and then defined a short-list of similarities and differences.

It should be noted, however, that the selection of the case studies has been restricted only to the context of Italy. There are two major reasons for this. The first is that we decided to limit the scope of the research to a single culture. The second is that there is extensive literature, also in English, covering the case of Italian local production systems. The large availability of already published literature minimized the risk associated with the empirical work.

Contextualization: The principle of contextualization requires critically reflecting on the historical and social background of the research setting. It is based on the consideration that there is an inevitable difference in understanding between researchers and participants, which is a consequence of the historical distance between them. The interpreter's task is not to cover up this distance, but to consciously investigate and bring it out. The aim is to set the subject of investigation in its historical and social context. Different from the positivistic understanding of history, which is based on the idea that historical patterns repeat over time, interpretive research seeks to clarify how the past shapes and influences the future. The future is not a repetition of the past. People, events and facts are unique instances of unique historical and social processes. Interpretative researchers, therefore, should see people as the interpreters and protagonists of their history and not as products of history. The description of the historical and social context should reflect the active nature of the people embedded in it.

We interpret this principle at two different levels. First, we give an historical account of the development of local production systems in Italy. This also comprises the

historical factors that have shaped the development of the practice of mutual trust in these systems. Second, for each of the case studies we give an historical and social account of the factors that have contribute to their specific development.

Interaction between the researchers and the participants: The basic idea is that data is not simply collected, but is the product of social interaction between researchers and participants. This means that participants are not simply providers of information, but interpreters and analysts themselves. The interpretation of data should not be unidirectional, from the investigator to the data, but a result of triangulation between investigator, participants and data.

In our case it has not been possible to perform multiple visits and conduct more than one interview. Therefore, we attempted to share and discuss our vision with the interviewee from the very beginning. The style of the interview was as follows: we presented our point of view on the case study and then we asked whether they agree and why. In this way we have been able to confront and collect different visions and opinions.

Abstraction and generalization: Interpretative researchers do not interpret abstraction and generalization in a positivistic sense. From this point of view generalization and abstraction mean to what extent specific findings can be extended to other related cases and situations. From an interpretative point of view abstraction and generalization mean being able to relate peculiarities of a specific context to general and abstract categories and concepts. According to Walsham (1993) the validity of the inferences drawn from one or more cases does not depend on the representativeness in a statistical sense, but on the plausibility and cogency of the logical reasoning used in describing the results form the cases. Walsham argues that there are four types of generalization that can be drawn form interpretative case studies: the development of concepts, the generation of theory, the drawing of specific implications and the creation of deep insight. To generalize from case studies to theory, as we have explained above, we focus on two variables: power distribution and industry advancement. We choose these two dimensions for the following reasons. The first is that power is a “substitute” for trust (Luhmann, 1979; Williamson, 1975). For instance, a company that has monopolistic position within a market may use its power to “trust” its counterparts to behave in a certain way. The type of industry, between low-tech and high-tech, has been considered in order to

take into account the potential influence that the industry itself may exercise on the individuals' attitude to adopt computerized languages and systems of trust.

Dialogic reasoning: The fifth principle is the one of dialogic reasoning. This principle requires researchers to confront their prejudices, which guided the original research design, with the data that emerges in the process of empirical investigation. The fundamental point is that the researcher should make the historical intellectual basis of the research as transparent as possible to the readers and to themselves. In positivist social science prejudices are considered to be misleading when developing objective knowledge. In interpretative research prejudices are considered the basis of understanding. Our initial understanding of a subject is guided by our prejudices on the subject. The task of the interpreter is to distinguish between true and false prejudices. This principle can be applied several times in sequence so that the improved understanding of one stage becomes the prejudice for the next stage.

This principle requires researchers to continuously confront their prejudices against empirical evidence. The interpretation of this principle is implicit in the way we construct the interaction with the participants of the case studies. We always questioned our prejudices both in interaction with others and at the end of any case studies with ourselves. For us developing the case studies has been a learning process. The final generalization and abstraction we develop is to a large extent the consequence of a process of interaction between construction of prejudices and findings.

Multiple interpretations: The sixth principle is the one of multiple interpretations. The previous principles are applicable only to text-like information provided by a single source. This would ignore the fact that human actions are conditioned by social context. This principle, therefore, suggests the necessity to seek and document the multiple perspectives and their specific rationale characterizing the social context and their interdependencies. This principle is similar to the one of dialogic reasoning. The major difference, however, is that the confrontation does not take place between the researcher's prejudices and contextual data, but between conflicting interpretations of the participants in the field.

In order to achieve this purpose we attempted for each case to interview companies that play different roles in the local system. For instance, companies in local

systems may roughly be distinguished as leaders, followers and sub-contractors. The leaders are the drivers of the local system. They tend to provide an idyllic perspective of their role in the local system. Followers and sub-contractors, especially where this leadership is very strong, tend to criticize the role of the leader as restricting the development of the local system as a whole. Furthermore, strong leaders tend to convey a negative perspective on the role of public associations and institutions. The others instead, given their relatively small dimensions, tend to highlight the positive aspects associated with these common institutions and associations.

It should be noted, however, that it has not always been possible to comply with this principle. In these cases we could not interview a sufficient number of representatives of the different social roles embedded in the local production system. In these instances we mainly relied on already published material to construct the case study. Our inferences based on already published material have been confronted and integrated with interviews with some of the leaders of the local production system, who have a global vision of the functionality of the system as a whole. In other cases we have only been able to rely on secondary data and published material to conduct the case study.

Suspicion: The last principle is the one of suspicion. It is drawn from the critical perspective and it is not commonly accepted in the interpretative approach. This principle suggests that once a social interpretation of reality has been constructed, the researcher should highlight the distortions deriving from this representation. In other words it is the researchers' task to show how specific social constructions of reality fail to achieve social welfare (Deetz, 1996).

At the conclusion of each case study we attempted to develop a critical analysis of the results. For instance, we extensively highlighted the distortions linked to the development of strong leadership that restrict the compatible development of the local and global standards of trust.

1.4 Conclusion

The aim of this chapter was twofold. The first was to introduce the problem of sustaining the creation of trust between local and global. In order to characterize the problem we developed two case studies from the literature. Both these case studies show

the failure of two inter-organizational information systems as a consequence of the interaction with specific local practices of mutual trust. These case studies have been useful to introduce the different terms that characterize the problem. From this perspective we introduce the definition of local and global and the concepts of trust creation and sustainable development. The last part of the chapter was devoted to characterizing our research approach. From this perspective we defended our decision to rely on an interpretative research approach. In order to support our decision we first justified our decision to rely on a qualitative approach. We then explained why we chose an interpretative approach. Finally, in the last section, we addressed how we have interpreted the principles that should guide interpretative research.

2 TRUST, INFORMATION AND COMMUNICATION TECHNOLOGIES: A REVIEW OF THE LITERATURE

In this second chapter we review the literature on trust and the relative roles of information and communication technologies as a media for trust. We do not focus on the definition of trust because there is agreement on defining trust as positive expectation (Rousseau et.al., 1998). We focus, instead, on the different perspectives on trust. As argued by Bigley and Pearce (1998), the issue of trust has received much attention in recent decades in the field of organizational science and related fields. This has meant a proliferation of the relative definitions and conceptualizations of trust. Consequently, scholars have recently proposed different typological systems intended to organize the vast literature on the subject.⁸

In this chapter we rely on Granovetter's categorization (1992), which distinguishes between three perspectives: under-socialized, over-socialized and embedded. Each of these perspectives is characterized by a different assumption about the nature of human rationality. The under-socialized perspective is based on the assumption of self-interest seeking rationality. The over-socialized perspective is based on the assumption of normative or behavioral rationality. The embedded perspective is based on the assumption of network rationality. The assumption on human rationality, as we shall see, has major

⁸ See among others Bromiley and Cummings, 1995; Bigley and Pearce (1998); Hosmer (1995); Lewicki and Bunker, 1995a, b; Mishra, 1996; Sitkin and Roth, (1993).

implications on the way trust is conceptualized. We choose this categorization because it is consistent with our aim to show that trust, like knowledge, can also be divided into tacit and codified.

In the first part of the chapter we review the three perspectives that Granovetter proposes. We highlight the specific assumption made on the nature of human rationality, the specific conceptualization of trust and the specific mechanisms proposed to support trust between individuals. In the second part of the chapter we review the literature about the roles of information and communication technologies as a media for trust. We reorganize this literature on the basis of Granovetter's three categories. Finally, we briefly review the main technological solutions proposed to sustain trust between firms in open electronic commerce. We conclude by drawing a table that summarizes the major findings of this chapter.

2.1 The under-socialized perspective

This section reviews the under-socialized perspective on trust. This perspective is based on the assumption of self-interest seeking rationality, which suggests that individuals behave to maximize their own economic and social interest. We distinguish between three prevalent forms of rationality: full, bounded and strategic. In the second part of this section the different assumptions on human rationality are correlated with the specific conceptualization of trust.

2.1.1 Self-interest seeking rationality⁹

The term rational is generally used to characterize processes of decision-making based on the logic of the expected consequences of a specific decision. The setting of decision-making, from this perspective, is characterized in terms of available choices. Each of these choices produces a different result (expected consequences). The decision-maker is assumed to choose the alternative that maximizes his individual preferences. The outcome of the decision-making, therefore, depends on four major factors:

1. The available information about the alternatives;
2. The available information about the consequences of these alternatives;

⁹ For a review of the concept see March (1994)

3. The available information about the decision-maker's preferences;
4. The available information about the rules linking the input and output of the decision.

Under the assumption of perfect rationality the information about the number of the available alternatives and their consequences are given. In other words, they are independent of the specific decision-makers' identity. This means, on the one hand, that the information about the alternatives is part of the specific context of decision-making. Therefore, it is the job of the decision-maker to search for this information. On the other hand, it also means that preferences and their order are also given and shared between decision-makers. Decision-makers are perfectly rational if they have complete information about the alternatives and their expected consequences.¹⁰

The same assumptions apply to the concept of bounded rationality. The only difference is that the decision-maker is assumed to operate/decide under conditions of environmental uncertainty/complexity. This means that the decision-maker does not have complete information about the alternatives and their consequences. Therefore, even if the decision-makers are intentionally rational, they aim to maximize their preferences, they are bounded by their limited capacity to search and process information. There are two major factors contributing to bounding the decision-makers' rationality. The first, physical, refers to the limited human capacity to process and store information. The second, cognitive, refers to the limited capacity to develop consistent representations of reality. This means that, even if decision-makers hold all the relevant information to properly decide, they have a limited capacity to fully understand the implication of this information.

The majority of economic theories are based on the assumption of self-interest rationality. Classical economic theory, moreover, is based on the assumption that economic agents are fully rational and behave ethically. Therefore, they have complete information about the available market alternatives and their relative price. Furthermore, it is based on the assumption that there are an infinite number of players in the market. Transacting parties, therefore, do not recognize each other and there is no probability that they will encounter each other again in the future. This implies that there is no dependence between transacting parties and that there are no costs of switching between market alternatives. Under these conditions the best mechanism of coordination between

¹⁰ See Simon (1981) for a full treatment of the concept of bounded rationality.

transacting parties is the invisible hand of the market. This is because, given that the transacting parties have perfect information about the distribution of the price, they are able to select the offer that maximizes their own profit.

The assumption of strategic rationality extends the traditional assumption of self-interest seeking rationality in order to comprise the opportunity for opportunistic behavior (Williamson, 1975; 1985). Opportunism is defined as self-interest seeking with guile. It refers to the possibility that one or more parties of a business transaction exploit temporary information and/or power advantages to realize unfair profits over counterparts.¹¹ It should be noted that opportunism does not imply fraud. Transacting parties may behave opportunistically without committing any fraud. For instance, a party exploiting contingencies, which is not contemplated in the contract negotiated by the transacting parties, behaves opportunistically, but not necessarily fraudulently. It should also be noted that opportunism might not be committed by a single transacting party, but also by a coalition, such as in the case of a cartel between the leading firms or suppliers of a specific resource. The typical example is the cartel between the main countries supplying oil, which control the price of the commodity.

The relevance of the assumption of strategic rationality is constrained by two conditions. The first condition is the combination between bounded rationality and environmental complexity. The combination between these two factors implies, on the one hand, that the transacting parties are limited in their capacity to search for and process information and, on the other hand, that they are also limited in their capacity to foresee possible contingencies that may influence/change the outcome of transactions. Information, therefore, may be asymmetrically distributed between the transacting parties and be opportunistically exploited by one of them. The second condition is the case of asymmetric distribution of power between transacting parties. This is the case of specific transaction, where the number of available market alternatives is only limited. The extreme case, from this perspective, is the monopoly by a single firm within a specific market. The monopolist may exploit its market power to impose unfair prices on the supply of a specific resource/service.

¹¹ A transacting party has a power advantage over his counterpart when the second is dependent on the first to achieve his goal.

This section has introduced the concept of self-interest rationality. We distinguish between three different forms of rationality: perfect, bounded and strategic. These three assumptions share a common origin, which is the idea that the rationality of individual behavior is based on the achievement of the individuals' self-interest. They differ mainly for two reasons. The first reason is the individuals' capacity to search for and process information. The second reason is the ethics of individuals' behavior. In other words, to what extent individuals are willing to behave within the moral and ethical norms regulating a society. Having defined the concept of self-interest seeking rationality, in the next section we address the relationship between the different forms of self-interest rationality and the different conceptualizations of trust.

2.1.2 Trust as rational choice

In the previous section we argued that the assumption of self-interest rationality is based on the idea that individuals behave to maximize their self-interest. Trust, according to this perspective, is conceptualized as a rational choice.¹² Therefore, it is defined as a function of the mutual self-interest to reciprocate trust. This section aims to define the specific relationship between each form of rationality, as defined in the section above, and the relative conceptualization of trust. Our starting point is the assumption of perfect rationality. We continue with the assumptions of bounded and strategic rationality.

In classical economic theory, trust is defined as a positive externality (Arrow, 1974). Externalities are costs or benefits generated, but not paid within specific business transactions (Coase, 1960). Externalities may be either positive or negative. They are negative in the case where a transaction creates costs for the collectivity. The typical example is the costs of pollution, which are not directly paid by the polluters. They are positive, instead, if they are benefits jointly shared within a collectivity. For instance, the users of a telephone network benefit from the dimension, in terms of number of users, of the telephone network. However, the users do not directly pay for this benefit.

Arrow (1974) argues that when we go to a petrol station we do not question whether or not the attendant will fill our tank after we have paid or, vice versa, the attendant does not question whether we will run away before we have paid. We expect

¹² See among others Axelrod (1984); Barber (1983); Chiles and McMackin (1996); Dasgupta (1988); Gambetta

each other to fulfill our obligations. In the classic model of the market, therefore, trust is conceptualized as a positive externality, which is shared between the market players. It is the minimum level of cooperation that is necessary for a business transaction to be completed.

The assumption of bounded rationality suggests that individuals are bounded in their capacity to maximize their own self-interest because they do not have enough information about the alternatives and consequences of their actions. Luhmann (1979) distinguishes between trust and confidence. He argues that trust refers to risk. It means that in the case of trust individuals are aware of the potential risk associated with a given alternative. However, the outcome is known only in terms of probability. The function of trust, according to Luhmann, is to reduce the complexity of the process of decision-making to a limited number of feasible solutions. In the case of confidence risks are not known. Individuals, therefore, hope for the best, rather than being conscious of the potential risks existing.

The difference between trust and confidence is important in terms of learning. In the case of trust, in fact, knowing the risks involved enables the opportunity to learn from the feedback of the action. In the case of confidence learning can not take place because individuals are not aware of the risks they are taking. Therefore, they can not evaluate the efficiency and effectiveness of their actions. Trust plays a key role in the process of learning as it reduces the complexity of the decision and enables the opportunity to learn from experience. Trust, indeed, is re-calculated, ex-post, on the basis of the outcome of the action (Luhmann, 1974).

The assumption of strategic rationality belies the existence of mutual trust in the market (Williamson, 1975). Economic agents are pictured as astute calculators continuously looking for alternative ways to profit by, if necessary, cheating on their counterparts. Transacting parties can not expect their counterparts to behave in a trustworthy and fair manner. Therefore, trust can only be enforced through institutional mechanisms to prevent and/or punish opportunistic behavior.

There are three major ways to sustain the development of trust between transacting parties: structural and procedural constraints, selection procedures and policing

mechanisms, risk spreading and insurance like arrangements (Shapiro, 1987). The first mechanism is based on the formalization of a set of behavioral rules and structural constraints. The second method is based on the formalization of trust-signals, such as a diploma or a certificate of quality. The third method is based on pooling individuals' resources to create advance protection against deviant behavior, such as insurance companies do.

The efficiency of these systems depends on four factors (Dasgupta, 1988):

1. The existence of an appropriate system of rules that define trust and opportunism.
2. The existence of an appropriate system of incentives, which reward trust and penalize opportunism;
3. The credibility of the guardian of trust. From this perspective the process of trust creation is delegated to a system of authorities. Its function is to regulate and control trust within a society. The typical example of a guardian of trust is a judge. The function of a judge is to punish opportunistic behavior. If the judge is not credible the citizen will not be willing to recognize the judge's authority and judgments. Therefore, judges lose their capacity to provide trust between citizens.
4. The measurability of trust. The credibility of the guardian of trust requires that trust is measurable. This means that the rules to distinguish between trustworthiness and opportunism should be clear and objective. There should be no room for subjective interpretation. In other words the behavior of an authority should be evaluated on the basis of objective rules, which define whether the authority is performing correctly or is pursuing self-interest. If these rules are not available the performance of the authority may be the cause of conflicts.

From this perspective market and hierarchy are at the opposite ends of a single continuum between trust and control (Ring and Van de Ven, 1992; Williamson, 1985; Chiles and McMackin, 1996; Macauley, 1963). The ideal market is not centrally regulated. The system of prices and competition is sufficient to guarantee trustworthiness and efficiency. If the number of market players is infinite, competition is sufficient to guarantee the convergence of the market price toward the marginal production costs. Parties that are not competitive will fail. The price, therefore, is an efficient mechanism to

(1988); Noteboom et.al. (1997) and Williamson (1993).

signal trustworthiness and efficiency. Hierarchical systems are based on the vertical integration of a number of adjacent transactions. Therefore, the trustworthiness of the entire process is guaranteed and enforced by a central authority.

Williamson argues that there is a trade-off between market and hierarchy, which depends on the complexity and specificity of transactions. The complexity of a transaction is measured in terms of uncertainty. The uncertainty associated with a specific transaction restricts the capacity of transacting parties to set up a common system of rules to govern the transaction and, therefore, the risk of opportunism increases. Williamson argues that the more complex the transaction the more efficient it is to vertically integrate it.

The idiosyncrasy of the transaction depends upon either the number of suppliers or buyers. The greater the number of suppliers or buyers of a specific resource the less their relative market power. The owner of a specific resource, therefore, can opportunistically exploit their relative market power. This problem is not relevant only in the case of a small number of suppliers or buyers, but also in the case of long-term contracts where the costs of re-selecting a new partner or terminating the transaction are high. Williamson argues that also in the case of specific transactions it is more efficient to vertically integrate them.

Williamson (1985) has recently revised his initial theory in order to consider the influence of the transaction-repetitiveness on the efficiency of the governance structure. Axelrod (1984), in fact, has shown that the expectation of future transactions stimulates parties to invest in mutual trust and reputation (Hill, 1990; Gulati, 1995). Therefore, transaction repetition reduces the probability of opportunism. However, Granovetter (1992) argues that the repeated simulation of trustworthy behavior is one of the best fraudulent strategies because transacting parties tend to reduce the level of control over each other. The opportunistic party, therefore, exploits the low level of control to take advantage of his counterpart's trust.

Furthermore, the efficiency of vertical integration depends on the frequency of business transactions. If transactions are vertically integrated the fixed costs are prevalent over the variable ones. Therefore, the efficiency of vertical integration increases with the frequency of the transaction.

Williamson, as a consequence of the introduction of the concept of transaction-frequency, has identified two intermediary forms of governance between market and hierarchy (see fig. 2.1). The first, bilateral, is based on mutual trust between the transacting parties. This first form of governance is applicable in the case of transactions characterized, on the one hand, by low levels of idiosyncrasy and, on the other, by high levels of frequency. The second, trilateral, is based on the mediation of a trusted third party, which is entrusted with solving potential disputes. This second form of governance is efficient in the case of transactions characterized by medium levels of idiosyncrasy, but low levels of frequency. The market is efficient in the case of transactions characterized by low levels of idiosyncrasy independent from the frequency of the transaction. The hierarchy is efficient in the case of highly specific transactions and independent from their frequency.

		Investment Characteristics		
		Nonspecific	Mixed	Idiosyncratic
Frequency	Occasional	Market Governance (Classical Contracting)	Trilateral Governance (Neoclassical Contracting)	
	Recurrent		Bilateral Governance (Relational Contracting)	
			Unified Governance (Contracting)	

Fig. 2.1. Matching between governance structures and commercial transactions - Adapted from Williamson (1979).

This section has focused on the concept of trust from an under-socialized perspective. We define the assumptions on the form of human rationality. For each of these

assumptions we derive the implications on the conceptualization of trust. The next section introduces the over-socialized perspective, which differs from the under-socialized one in that it is based on the assumption of behavioral rationality. Individuals, according to this assumption, interpret a set of cultural norms and values, which are shared within a community. The next section, therefore, derives the implications of this assumption on the conceptualization of trust.

2.2 The over-socialized perspective

In the previous section we introduced the concept of trust as a rational choice. The over-socialized perspective is based on the assumption of behavioral rationality. Individuals are expected to behave according to a specific set of cultural norms and values, which support the spontaneous cooperation between members of a community (Fukuyama, 1995). There is a distinction between low and high trust communities. The members of the first are selfish. They aim to maximize their self-interest. The members of the second are characterized by collective orientation. In these communities, therefore, the interests of the collectivity prevail over the interests of individuals.

This section is divided into two subsections. The first defines the assumption of behavioral rationality. From this perspective we introduce the notion of identity. Identity, as we shall see, plays a double role. The first is to stimulate the individuals' identification with a set of norms and values characterizing a specific social role in the community. The second is to stimulate the creation of coherent expectations about the behavior of an individual playing a specific social role in the community. Once the concept of behavioral rationality has been defined, we derive the implication of this assumption on trust.

2.2.1 Behavioral rationality¹³

The concept of self-interest seeking rationality is based on the assumption that alternatives and their consequences are an integral part of the situation. The specific identity of the decision-maker, therefore, does not play any role in defining them. The concept of behavioral rationality, on the contrary, is based on the idea that the perception of the alternatives and their values depends on the specific identity of the decision-maker.

¹³ See March (1994)

There is not an efficient or optimal decision, but only an appropriate one. The appropriateness of the solution depends on the specific conjunction between the decision-makers' identity and the situations' characteristics. Therefore, a key role in the understanding of human behavior is played by the concept of identity.

Identity is defined as a set of norms and values characterized by a specific role within a community. The concept of identity plays a double role. On the one hand, it represents a set of behavioral guidelines for the members of a given community playing specific social roles. On the other hand, it represents a set of expectations about the behavior of their counterparts playing specific roles in the community. There is tension between these two dimensions of identity. On the one hand, individuals are stimulated to personalize their interpretation of a role as a way to differentiate themselves from others. On the other hand, individuals are stimulated to conform to a specific social role as the basis of social consensus. The prevalence of one component over the other is a matter of cultural preference (Hofstede, 1980). Collectivist societies, such as Japan, show a strong preference toward conformity. Individualistic societies, such as the USA, on the other hand, show a strong preference toward the personalization of social roles.

Social roles have three major functions. The first is to categorize and organize knowledge about the properties and characteristics of a specific role, such as how a police officer should behave or how to recognize a police officer. Secondly, it is a social contract between parties that belong to a specific group and/or community. From this perspective, there is not a third party that is explicitly entrusted to judge behavior and penalize opportunism rather it is the role of the community as a whole to judge. Community-members, who do not behave morally and ethically, are "expelled". Compensations and penalties are not necessarily monetary, but social, for example, losing reputation. Thirdly, it is a statement about the morality and the value of an individual. Individuals do not follow social rules simply because they are forced to, but because they believe and identify with these rules. The motivation is more internal than external. It has more to do with self-respect and honor than fear.

In this section we focus on the notion of behavioral rationality. Individuals' behavior is expected to be dependent on the specific identity of the decision-maker. Self-interest is not defined as an intrinsic and objective character of the situation, but is a

function of the specific identity of the decision-maker. A member of Greenpeace and a director of a chemical plant have completely different perceptions and understandings of the problem of pollution. Therefore, their perception of what constitutes their self-interest differs completely. It follows that there is not an optimal choice, but the optimum depends on the decision-makers' identity. In the next section we derive the impact of this assumption on the concept of trust.

2.2.2 Trust as social capital¹⁴

In the previous section we introduced the concept of behavioral rationality. In this section we aim to derive the implications of this assumption on the concept of trust.

The over-socialized perspective is based on the concept of identity. Identity does not only have an individual meaning, it is also a social contract between community members. It is the basis for sharing expectations about reciprocal and mutual behavior and, therefore, trust between community members.

Fukuyama (1995) argues that trust is a moral obligation, which arises within a community of regular, honest and cooperative members who behave on the basis of shared norms and values. He also argues that trust is culturally determined. Culture, according to Hofstede (1980), is a software program of the mind, which guides the behavior of individuals belonging to specific communities or groups. Culture, of course, does not predetermine the behavior of humans as a software program determines the "behavior" of a computer, but it influences their behavior. Therefore, culture is a common basis of interpretation.

Cultures can be characterized by distinguishing between two components: norms and values. Norms are the behavior that is common between the members of a community. These can be observed. They are explicit characteristics of a community. Values are preferences toward certain states of affairs, such as clean versus dirty. These can not be directly observed. Therefore, they are tacit. Trust as a moral obligation has explicit components, which are the norms, and tacit components, which are the values.

Fukuyama distinguishes between high trust societies and low trust societies. These societies differ mainly in terms of spontaneous sociability, which is the spontaneous

¹⁴ For a review on the concept of social capital see Nahapiet and Ghoshal (1998); Coleman (1984; 1987; 1988; 1990) and Putnam (1993a; b and 1995).

ability to form associations and cooperate within their terms of reference. Fukuyama uses the term spontaneous in order to emphasize the distinction between cooperation based on calculation and cooperation based on morality. The first, as we suggested in the previous section, is based on rational calculation of the economic and/or social returns in trusting the counterpart. Calculative trust is based on the power of external authorities, which guarantee the contractual terms of the transactions. Moral trust does not require external enforcement. Members of a high trust society spontaneously conform to the social and cultural norms and values that regulate their interactions.

In characterizing the distinction between high and low trust societies, it is not sufficient to focus on the spontaneity of trust, but we must also focus on where trust is spontaneous. Fukuyama, from this perspective, argues about the paradox of family values. In low trust societies, such as China and Italy, the family is the basis of social order. Mutual trust, in these societies, is restricted to the closed network of kinship. There is little cooperation between non-relatives. This specific characteristic, for instance, makes the transition from family-business to managerial corporation very difficult. The development of large managerial corporations in these low trust communities has to be enforced and sponsored by the state. In Italy, for instance, the main large corporations are either state-owned or strongly subsidized by the state.

High trust societies, on the other hand, are characterized by the presence of several intermediaries, associations and institutions between the family and the state. The nature of these associations and institutions may have an economic purpose, such as an association between suppliers of a firm, or social, such as religious groups or civic communities. The function of these institutions is to continuously mediate between private and collective interests. The existence of several intermediaries and associations is more an output of trust than an input for its development. Therefore, why in these societies is mutual trust more diffused than in low trust societies? The answer is tied to the notion of extended-family or clan, which is present in high trust societies (Fukuyama, 1995, Ouchi, 1980). Extended families or clans are not based on kinship, but on affiliation to a community. Therefore, trust crosses family boundaries within the community. From this

perspective, Fukuyama seems to suggest that the spontaneity of trust within a community depends on the degree of individualism and collectivism.¹⁵

Doney et.al. (1998), drawing on the works of Hofstede and Fukuyama, have developed a model to interpret the influence of national culture on the development of trust. They distinguish between five categories of cognitive process underlying the development of mutual trust. These are respectively calculation, prediction, intentionality, capability and transference. We have already discussed calculative trust. Prediction-based trust is based on the parties' ability to forecast behavior during a transaction. The forecast is mainly based on the accumulation of past experience and on the belief that there is continuity between individuals' past and future behavior. Intentionality-based trust is based on the evaluation of the counterparts' motivation to behave trustworthily. Therefore, trust is based on the belief that the counterpart is motivated enough to behave trustworthily. Capability-based trust is based on the evaluation of the counterparts' capacity to keep promises. Transference-based trust, finally, is based on the transferal of trust from known people to unknown people, who are directly or indirectly related. In other words, it is based on the belief that if A trusts B and B trusts C, then A logically must trust C.

Doney et.al. characterize culture by distinguishing between three categories: in relation to self, in relation to authority and in relation to risk. These categories characterize communities for their specific solutions to common basic social problems. The first category refers to the relationship between the self and others. This category can be further characterized by distinguishing between individualism versus collectivism and masculinity versus femininity. We have already explained the first sub-category. The second sub-category concerns the dominant values in society between male and female values. Masculine cultures are characterized by the prevalence of tough values, such as assertiveness, success and competition. Feminine cultures, on the other hand, are characterized by tender values, such as solidarity (Hofstede, 1980).

The second category, in relation to authority, reflects the emphasis a society puts on hierarchical relations. High power distance societies, such as France, show a strong preference toward hierarchical relationships. Low power distance societies prefer to distribute power.

¹⁵ See Hofstede (1980) for a definition of the concept individualistic versus collectivistic societies.

The third category, in relation to risk, refers to the perception of risk and strategies to cope with it. Doney et.al. refer to Hofstede's distinction between high versus low uncertainty avoidance societies. It should be noted, however, that risk and uncertainty are not the same (Hofstede, 1980). The subject of risk is known and can be predicted in terms of probability. The subject of uncertainty is not known and can not be predicted. Uncertainty avoidance societies look for structure and rules, which make events clearly interpretable and predictable. Paradoxically, members of uncertainty avoiding cultures are willing to take more risks, which are known, in order to reduce ambiguities. Members of uncertainty avoiding countries, for instance, prefer to attack a potential opponent rather than wait. Therefore, they are willing to take the risks associated with attacking rather than patiently waiting for the counterpart's first move.

Intersecting cultural dimensions and trust-forms, Doney et.al. propose a matrix to interpret the different forms of trust in different cultures (see table 2.1). Table 2.1 links the different cultural dimensions to the specific norms and values that characterize each of these dimensions to the prevalent attitudes emerging in the process of building trust. For instance, in individualistic cultures trust is developed on the basis of calculation and the manifested ability of counterparts to keep their promises. The function of this taxonomy, therefore, is to define, on the basis of the cultural characteristics of a community, the specific strategy of trust creation that can be implemented to sustain the development of mutual trust between members.

In the under-socialized perspective, market transactions fail as a consequence of the natural attitude of economic agents to behave opportunistically. Hierarchical systems of formal rules and authorities are developed to minimize the costs of opportunism under conditions of complexity and specificity. However, Ouchi (1980) argues that hierarchical systems fail under conditions of ambiguity. The functionality of hierarchical systems requires performance to be measurable. The lack of common standards to evaluate performances reduces the capacity of authorities to prevent and punish opportunism.

Ouchi argues that under conditions of ambiguity the formation of clans better supports the organic development of congruent goals between their members.¹⁶ A clan is defined as the obverse of a market, since it achieves efficacy under the opposite conditions

¹⁶ See also Ciborra (1993).

of high performance ambiguity and low opportunism. Forming clans enables the socialization of common norms and values and the development of solidarity between members. Solidarity does not follow on from functional dependence (contractual alignment between individuals' self-interest) between parties, but by their mutual recognition of sharing a common affiliation. It should be noted that Ouchi focuses only on the notion of clans where Fukuyama focuses on the relationships between family and clan and then clan and society.

CULTURAL DIMENSIONS	ASSOCIATED NORMS AND VALUES	INFLUENCE ON TRUST-BUILDING PROCESS
Relation to Self	Individualism Self-orientation Value individual accomplishment Tolerance toward individual behavior and opinions Low loyalty to other people and institutions Interaction based on self-interest and competition Loose interpersonal ties	Individualism Calculative (+) Capability (+)
	Collectivism Group orientation Value joint effort and group rewards Conformity Loyalty to other people and institutions Interdependence and cooperation Strong interpersonal ties	Collectivism Prediction (+) Intentionality (+) Transference (+)
	Masculinity Individual achievement Confrontation Independence Action	Masculinity Calculative (+) Capability (+)
Relation to Self	Femininity Solidarity Cooperation Honoring moral obligations	Femininity Prediction (+) Intentionality (+) Transference (+)
Relation to authority	High power distance Prestige, power and wealth Conflict Authoritarian norms	High power distance Calculative (+) Prediction (+) Capability (+)
	Low power distance Egalitarian relationships Cooperation Interdependence, affiliation and solidarity	Low power distance Intentionality (+) Transferability (+)

Tab. 2.1. The influence of cross-cultural differences on the nature of trust.

CULTURAL DIMENSIONS	ASSOCIATED NORMS AND VALUES	INFLUENCE ON TRUST-BUILDING PROCESS
Relation to risk	High uncertainty avoiding Formal rules and regulations Human behavior is purposive Compromise Faith in the institutions Belief in experts and their knowledge.	High uncertainty avoidance Prediction (+) Intentionality (+) Capability (+) Transference (+)
	Low uncertainty avoidance Tolerance for deviance Human behavior is unpredictable Conflicts Weak faith in people and institutions	Low uncertainty avoidance Calculative (+)

Tab. 2.1. The influence of cross-cultural differences on the nature of trust (continuation).

In this section we have introduced the concept of trust in the over-socialized perspective. Trust is defined as a moral norm. We have distinguished between high and low trust societies. In high trust societies trust and cooperation are spontaneous between community members. These communities are characterized by the existence of a large number of intermediary associations of different natures that contribute to sustaining the socialization and collectivization of interests. Referring to the work of Doney et.al., we have expanded this initial categorization between high and low trust societies to comprise the specific relationship between cultural dimensions and specific strategies of trust creation implemented in different communities. The major limitation of this perspective, as we will argue in the following section, is the assumption that all members of a community automatically follow the cultural norms and values previously imprinted on their minds.

2.3 The embedded perspective

Granovetter (1992) argues that the under- and over-socialized perspectives share a common conceptualization of human behavior, which is based on the atomistic view of human action and decision. Individuals are assumed to decide and act in perfect isolation, within a social vacuum. There is no direct and mutual influence between individuals' behaviors. The relationships between individuals are mediated either by a common institutional system (under-socialized perspective) or a common cultural system (over-socialized perspective).

In the under-socialized perspective atomization follows on from the assumption of self-interest seeking rationality. In the under-socialized perspective individuals act on

their own in order to maximize their self-interest and without regard for any relationships with others. Individuals are also expected to behave opportunistically. Individuals, therefore, do not only maximize their own self-interest, but they also exploit their counterparts. The institutional system, therefore, is designed to enforce convergence between interests, to prevent and/or detect opportunism, and stimulate “cooperation”.

In the over-socialized perspective atomization follows on from the assumption that cultural rules are automatically executed. Behavior, in fact, is determined by culture as an operating media. Individuals behave independently from each other and on the basis of culture alone. Therefore, individuals follow the cultural norms as if they were programmed into their minds (Hofstede, 1980). That is, the individual executes the culture as if it were a mechanism or software of the mind.

In the embedded perspective there is a meso level between the individual level (micro level) and the institutional system (macro level). This is the level of the network of social relationships. Individuals are embedded within networks of social relationships, which directly influence their expectations and behavior. For instance, two brothers doing business together behave differently from two businessmen doing business together for the first time. Human behavior, therefore, is no longer the product of mediation between self-interests and institutional rules or the automatic application of norms and values. The way these norms, values and rules influence behavior depends on the specific nature and structure of the relationships between parties. The network, on the other hand, changes the nature and value of these norms.

The embedded perspective, therefore, proposes an evolutionary conceptualization of trust. It is possible to distinguish between trust *ex-ante* and *ex-post*. *Ex-ante*, it is the product of experiences of interaction accumulated within networks of personal, institutional and cultural relationships. *Ex-post*, the specific experiences of interaction change and/or consolidate the specific nature, value and structure of trust shared within a network/community.

This section is structured in two parts. In the first we address the concept of network rationality by distinguishing between three dimensions: structural, relational and cognitive. In the second we derive the implications of these concepts for the

conceptualization of trust. We focus on two aspects: the evolution of trust at relational level and the interdependence between relational and network levels.

2.3.1 The concept of network rationality

The concept of network rationality is based on the idea that individuals mutually influence each other's expectations, behaviors and decisions through networks of social and economic relationships.¹⁷ This hypothesis sharply contrasts with that in the under-socialized and over-socialized perspectives, which is based on the idea that individuals behave on their own either on the basis of a common culture or on the basis of their own self-interest. In both these perspectives parties are not capable of changing and modifying the nature and character of the context in which they are embedded; they can only choose given the context. In the embedded perspective the context is defined as a network of relationships between parties.

A network is a model or metaphor that describes a number, usually large, of entities that are connected (Axelsson and Easton ,1992). These entities may either be individuals, firms or artifacts. A relationship is a bond of interdependence between two parties. There is interdependence between two parties if each of them depends on, or believes they depend on, the decisive contribution of the other to achieve their respective goals. Let us assume that A depends on B to achieve the goal *c*. The reliance of A on B depends on two factors. The first is the importance A places on *c*. The second is the number of alternatives available to B. If only B is able to do the task required to achieve *c*, then A is completely reliant on B to achieve the goal. The more reliant A is on B, the more B can exercise influence and power over A.

There are three dimensions that can characterize the concept of relationship: content, scope and nature (Soda, 1998). Content refers to the type of "product" exchanged or shared within the relationship, such as information, norms and values (social), goods and services (economic) and association or membership and so forth. Scope refers to the goal of the relationship. Let us assume that the scope of a relationship between two firms is to cooperate on a research project. This goal can be achieved in different ways. It can be achieved through the simple exchange of information or through the formation of a joint

¹⁷ For a review on the concept of network rationality and networks in general see Axelsson and Easton (1992), Easton (1992), Ford (1990), Jarillo (1988), Nohria and Eccels (1992), Powell (1990).

research group. The third dimension is the nature of the relationship. This third dimension refers to the specific characteristics of the relationship, such as strength, intensity, longevity and so forth.

Nahapiet and Ghoshal (1998) distinguish between three dimensions of the network: the structural, relational and cognitive. In making the separation between structural and relational dimensions of the network, they draw on Granovetter's distinction between structural and relational embeddedness. The term embeddedness refers to the influence of the network on its members' behavior. Granovetter distinguishes between two levels of embeddedness. The relational level describes the kind of personal relationships, which people have developed through a history of interaction, that influence their mutual behavior. Granovetter argues that the ways workers and supervisors interact do not simply follow on from the meaning of these categories in a technical division of labor, but also by the kind of personal relationships.

The structural embeddedness concerns the properties of the social system and the network of relations as a whole. It refers to the social pressure that the network as a whole exercises on the development of a single relationship. For instance, it is easier for a worker to maintain a good relationship with his or her supervisor if the supervisor has good relationships with other workers. If good relationships are not shared by all, other workers might make life very difficult for the one who is close to the supervisor (Granovetter, 1992).

Granovetter argues that the influence exercised by the network structure as a whole is subtler than the one exercised by the network of personal relationships. The network of personal relationships directly influences individuals' behavior. The influence of the structural dimension depends mainly on the configuration of the network as a whole and the position of the relationship within the network. The cohesiveness of the network, for instance, is important because, on the one hand, it determines the capacity and the relative efficiency of the network to share information.¹⁸ Therefore, individuals are better

¹⁸ It should be noted that the cohesiveness of the network is effective to socialize information about other members' behaviors, but it is ineffective to have access to external information. For instance, whether an individual leaves his job depends not only on his social attachments, but also whether he does have access to information about alternative opportunities. Cohesive networks are not appropriate to sustain accessibility to external source of information.

informed about the behavior of the others in the network and they can be mutually influential. The cohesiveness of the networks' structure, on the other hand, defines the capacity and the efficiency of networks to create, socialize and share common behavior. In a cohesive group a worker may have absorbed from the group a set of behavioral principles that would make a close relationship with the supervisor unthinkable (Granovetter, 1992).

The third dimension refers to those resources providing shared representations, interpretations and systems of meaning among parties. This third dimension is not yet widely accepted in the literature on social networks. It refers to norms, values, codes, languages and narratives, in other words to the common culture, shared between the members of a network. Sharing these norms, values and languages within a network positively influence and stimulate the capacity of the members to create and socialize knowledge and innovation.

In summary, we can distinguish between two dimensions of a network. The first dimension is the relationship. The relationship between two parties directly influences their respective behavior at two different levels: social and personal. The social level refers to the relationship between two social roles, such as the relationship between a worker and a supervisor, or the relationship between a doctor and nurse. The personal level refers to the specific relationship that two parties have developed through a history of interactions. This last dimension of the relationship is the most important in understanding how the relationship between two parties influences their behavior.

The relationship is embedded within a network structure. The structure of the network directly influences the relationship between two parties and, therefore, indirectly their behavior. We can distinguish between two dimensions of the network structure: structural and cognitive. The structural dimension of the network refers to the specific configuration of the network of relationships. The structural dimension defines, on the one hand, the capacity and efficiency of the network to diffuse information about the behavior of its members. Therefore, the structural dimension influences the capacity of parties within relationships to monitor their behavior. The structural dimension, on the other hand, defines the social pressure upon a relationship. Therefore, the structural dimension determines the capacity and the efficiency of the network as a whole to support the socialization and internalization of common behavior.

The network is embedded within a specific cultural context. The cultural context provides a class of blueprints/scenarios that can be triggered off for the development of specific relationships. It is a repository of norms, values and rules regulating the interaction between specific social roles. The relationship between father and child, for instance, changes from culture to culture. In high power distance cultures the father is authoritarian whereas in low power distance cultures father and child are on more equal terms. Furthermore, culture provides a common repository of basic frameworks, codes and languages, which are required to sustain the development of social and personal relationships.

Up to this point we have proposed a top-down model of the network. The top layer is the cultural context, which is the context for the development of the network as a whole. The intermediary layer is the network, which influences the development of relationships. The bottom layer is the relationship, which influences the parties' behavior within relationships.

We can also move from the bottom to the top. The interaction between two parties modifies the nature of the relationship. For example, it may strengthen their specific relationship. Changes taking place at the relational level imply changes at the structural level. For instance, if two parties break their relationship the cohesiveness also changes. The structure of the network changes the cultural context. Members of governing bodies, for instance, are central to networks of political interests. Therefore, their votes can change the institutional and cultural structure and context.

2.3.2 Trust in the embedded perspective

In the embedded perspective, trust is defined as an evolutionary characteristic of relationships. It increases as a consequence of the accumulation of positive experiences. Blau (1964) suggests that parties initially test their mutual trustworthiness by starting with low risk transactions. Once they have evaluated mutual trustworthiness, they gradually expand the risk involved in their business relationships. Lewicki and Bunker (1995a;b) propose a model of the developmental process of trust within a relationship. They distinguish between three sequential stages. In the first, starting phase, trust is based mainly on rational calculation. In the second, developmental phase, trust is based on

knowledge (mutual predictability). In the third, maturation phase, trust is based on mutual identification (shared norms and values).

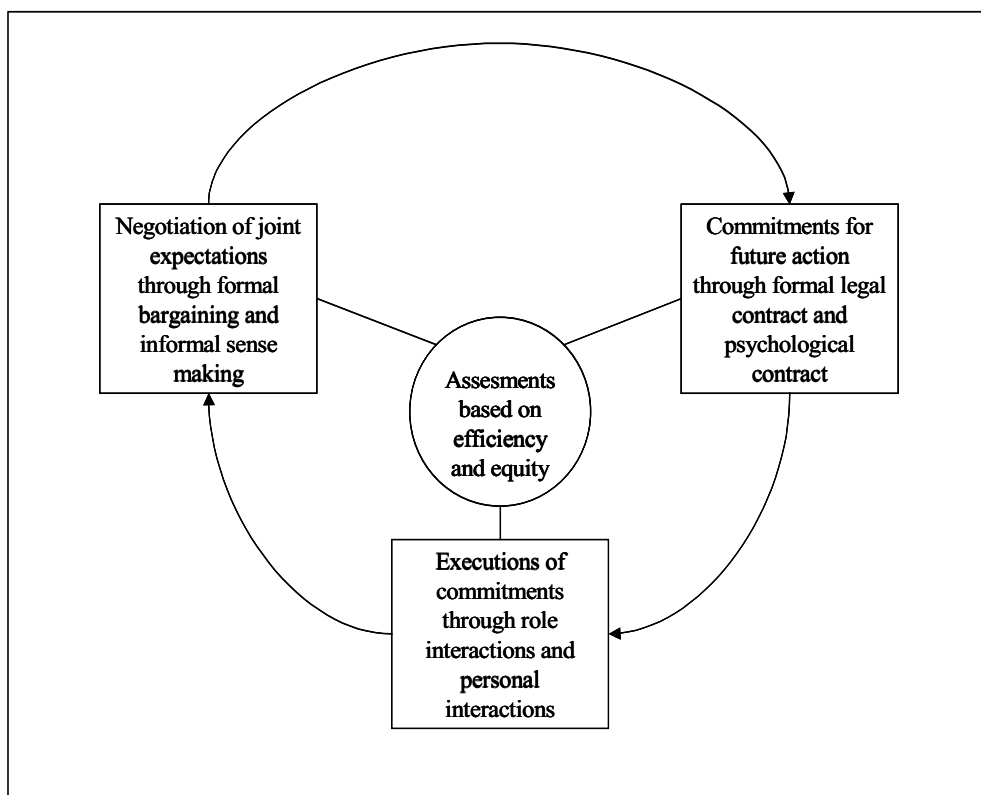


Fig. 2.2 – The cycle of development of cooperative relationships - Adapted from Ring and Van de Ven (1994)

Ring and Van de Ven (1994), similarly, distinguish between emergence, evolution and dissolution of cooperative inter-organizational relationships. The development of trust is sustained by repeated cyclical processes of negotiation, commitment and execution (see fig. 2.2). The interaction between formal and informal processes characterizes each of these phases: formal bargaining and informal sense making (negotiation), formal legal contract and psychological contract (commitment), roles and personal interaction (execution). The development of informal trust within cooperative inter-organizational relationships increasingly compensates or substitutes the formal basis of trust.

Trust may dissolve or fail to evolve for multiple reasons, such as violation of trust, little interdependence, and/or lack of interaction. The consequence of violating trust

and the cost of rebuilding it are directly correlated to the level of development of trust in the relationship. Therefore, the higher the level of trust the graver the consequences and costs of violating it. On the other hand, the capacity to detect a violation of trust diminishes with the development of the relationship. The development of trust in a relationship, in fact, is coupled with a reduction in the level of attention and rational control applied within the relationship (Granovetter, 1992; Ring and Van de Ven, 1994). It is for this reason that simulating the development of a relationship of mutual trust is one of the most successful strategies in defrauding a counterpart (Granovetter, 1992).

More generally, Ring and Van de Ven (1992) suggest that any significant imbalance between formal and informal components of trust increases the likelihood of cooperative inter-organizational relationships dissolving. On the one hand, an excess of formalization is the basis for a proliferation of conflicts, which restricts the development of mutual trust. On the other hand, excesses of informality and mutual trust increase the risk of opportunistic exploitation of relationships (Ring and Van de Ven, 1992, Granovetter, 1985; 1992).

Up to this point we have considered the developmental process of trust within a relationship, but how does the structure of the network influence this process? Not much research has been carried out on this subject. Granovetter suggests that being embedded in cohesive networks accelerates the creation of trust. There are two reasons for this. The first is that information within dense and cohesive networks flows faster (Burt, Knez, 1996). Therefore, the costs of behaving opportunistically increase proportionally with the connectivity and cohesiveness of the network structure. For instance, the cost to A of behaving opportunistically with B, who is connected to C, is not only limited to the relationship between A and B, but it also affects the relationship between A and C (see also Hill, 1990).

The second reason is that if one party is connected to a network of trustworthy parties, the possibility to behave opportunistically may not even cross his or her mind (Granovetter, 1992). The rationality behind this is that the prevalent characteristics of a network shape the behavior of its members. Therefore, if one person lives in a context where all the others behave opportunistically, he or she will not feel guilty about behaving opportunistically.

In this section we have introduced the concept of trust in the embedded perspective. Trust is defined as an evolutionary character of the relationship between two parties. Trust evolves through the accumulation of positive experiences of interaction. The development of mutual trust within a relationship substitutes formal and rational control. The development of significant imbalances between formal control and mutual trust, according to Ring and Van de Ven, reduce the likelihood of dissolution of the cooperative relationship. An excess of formal control reduces the opportunity of two parties getting to know each other personally. An excess of mutual trust exposes the relationship to opportunistic and fraudulent behavior. The density and cohesiveness of the network structure reduces the time and costs of developing mutual trust in a relationship. The motivations are twofold: the fast flow of information and the value of reputation.

2.4 The role of information and communication technologies in supporting the development of trust

In the previous sections we have analyzed the concept of trust by distinguishing between three perspectives. In this section we analyze the relation between trust and information and communication technologies. The key question is whether or not the development of information and communication technologies is able to sustain the development of mutual trust. We reorganize this literature according to Granovetter's categorization. Therefore, we distinguish between three categories of contributions: under-socialized, over-socialized and embedded.

The three perspectives, as we shall see, propose different interpretations of the roles of information and communication technologies in sustaining the development of mutual trust. In the under-socialized perspective, information and communication technologies are a substitute for the lack of mutual trust. In the over-socialized perspective, trust is a moral norm. Therefore, information and communication technologies do not play any specific role in sustaining the development of mutual trust between individuals. In the embedded, trust is based on the accumulation of experiences within a relationship. Therefore, even if information and communication technologies improve the individuals' capacity to create trust, implementing these technologies is not sufficient to sustain the development of mutual trust between individuals.

We start with the analysis of the under-socialized perspective, which is currently dominant in the field (Kumar et.al., 1998). Therefore, this category is rich in contributions. We then introduce the over-socialized and embedded perspectives. In these two subsections we highlight, on the one hand, the major criticism made of the under-socialized perspective and, on the other hand, the main contributions to these two perspectives.

2.4.1 The under-socialized perspective

In the under-socialized perspective, trust is a rational choice. Therefore, trust is based on information and calculation. Information and communication technologies, as we shall see, reduce the costs of searching and processing information. Therefore, information and communication technologies reduce the cost of developing trust. Miles and Snow (1986)¹⁹ argue that information and communication technologies are substitutes for lengthy trust building processes based on mutual experience. Transacting parties mutually agree on a general structure of payment for value added and then integrate them in continuously updated IS so that contributions can be mutually and instantaneously verified. Therefore, the development of open digital infrastructures enables the formation of dynamic forms of networking.

The under-socialized perspective on information and communication technologies is based on transaction cost theory²⁰. This theory, as we have already explained, suggests that, under specific conditions, there are costs associated with market transactions. Transaction costs depend on a combination of four factors, which are divided into two pairs. The first pair is the combination of bounded rationality and environmental complexity. This combination implies that information may be asymmetrically distributed and opportunistically exploited. Therefore, the transaction costs are the sum of those that each party has to bear to prevent the risk of opportunism. The second pair is the combination of opportunism and transaction idiosyncrasy. This combination implies a lack of competition on the supply- or demand-side of a specific resource. Therefore, power is asymmetrically distributed and can be opportunistically exploited by the most powerful party.

¹⁹ See also Miles and Snow (1992) and Miles and Creed (1995).

Transaction cost theory is useful in deciding if it is efficient to govern a transaction internally (hierarchy) or externally (market). External transaction costs are the sum of searching, negotiation and control costs within the market. Searching costs are the costs of collecting and processing information about available suppliers or buyers, their prices and reputation. Negotiation costs are those transacting parties have to bear when negotiating contractual terms. Control costs are those transacting parties have to bear to prevent and detect opportunism or insure the transaction against such behavior. Internal transaction costs are given by the sum of internal production and control costs. The decision between market and hierarchy, therefore, depends on the comparison between internal and external transaction costs.

The development of information and communication technologies changes the structure of transaction costs. The development of these technologies drastically reduces the costs of information and communication. They reduce searching costs, for example through the development of electronic markets and brokering systems. Furthermore, they reduce the cost of assessing the reputation of counterparts and, therefore, the advantages associated with opportunistic behavior. They reduce the cost of collecting and communicating information and, therefore, the cost of monitoring counterparts' behavior. Finally, information and communication technologies may also reduce negotiation costs, for example through the development of electronic procurement systems.

It should also be noted that the development of information and communication technologies reduces the transaction costs associated with power advantages. There are two motivations. The first is that the development of these technologies reduces the distance between markets. Firms, which were previously located in distant markets, compete with each other in a global electronic market. Therefore, there is increasing competition between firms. The second motivation is that this development reduces switching costs, which are the costs a party has to bear when switching buyers or suppliers. The development of these technologies, in fact, stimulates the standardization of business practices according to common standards. For instance, market places do not simply provide references to a large number of firms, but they also provide a common digital infrastructure through which to do business together. Therefore, the transacting parties can

²⁰ See for instance Malone et.al. (1987); Clemons et.al. (1993); Gurbaxani and Wang (1991) and Ciborra (1993).

easily switch from one supplier or buyer to another. Malone et.al. (1987) claim, on the basis of these arguments, that the development of information and communication technologies leads to an increasing usage of markets as opposed to hierarchies.

Clemons et.al. (1993), however, argue that in order to understand the effect of information and communication technologies on the trade-off between markets and hierarchies it is useful to separate coordination costs and transaction risks. Coordination costs are those incurred by the firm when coordinating activities between production units. Coordination is based on the exchange of information between units about price, production planning, scheduling, and delivery. Therefore, the development of these technologies dramatically reduces coordination costs. Transaction risks can be further separated into operational risks and opportunism. Operational risks are those caused by a misuse of information between transacting parties. Opportunism is a consequence of unforeseen changes in bargaining power. Clemons et.al. argue that the reduction of external coordination costs is not sufficient for a shift toward greater market coordination. In order for this shift to take place it is required that transaction risks do not increase proportionally. Clemons et.al. argue, on the basis of this analysis, that the development of information and communication technologies leads to intermediary forms of organization, between those of market and hierarchy .

The previous two contributions focused mainly on the impact of information and communication technologies on the efficiency of market transactions. Gurbaxani and Wang (1991), however, argue that the transition toward more market coordination is not so obvious. The development of information and communication technologies does not only reduce external transaction costs, but also internal ones. For instance, the development of these technologies also improves the efficiency and effectiveness of internal processes of supervision and control. Therefore, even if these technologies improve the efficiency of the market they may also improve the efficiency of hierarchical systems. Gurbaxani and Wang conclude that the decision between market and hierarchy depends on other factors, such as culture and managerial style.

This section has reviewed the under-socialized perspective on the role of information and communication technologies as trust media. Trust is the product of information and calculation of risks. The development of these technologies is expected to reduce the risk

of opportunism for two reasons. The first is that they reduce the unitary cost of accessing and processing information. Therefore, they reduce both coordination and control costs. The second reason is that they increase market competition by integrating previously separated market and by reducing switching costs. Therefore, information and communication technologies are a substitute for the lack of trust between individuals and for lengthy trust building processes based on mutual experience. The consequence is that the use of these technologies leads to more market coordination than hierarchical control. There are, however, scholars who argue that the development of these technologies also improves the efficiency of hierarchical control. Therefore, the choice between market and hierarchies is more a matter of cultural preference than economic efficiency.

2.4.2 The over-socialized perspective

In the over-socialized perspective, trust is a moral norm shared within communities. The nature of this norm is rather abstract. Therefore, it is difficult to translate it into a software program. The development of information and communication technologies, therefore, does not play any relevant role in the cost of developing trust.

Fukuyama (1995) argues that trust is not reducible to information. A virtual firm can have abundant information about its suppliers and clients, but, if they are all fraudulent, dealing with them will remain a costly process involving complex contracts and time-consuming enforcement. Even if the development of information and communication technologies reduces costs of sharing information and coordinating activities, without trust there will still be a strong incentive to vertically integrate activities. The development of these technologies, therefore, does not automatically lead to the spontaneous formation of communities and networks of firms. High trust societies, such as Japan and the North East of Italy, created networks of firms well before the information revolution. Low-trust societies may never be able to take advantage of the efficiency that these technologies offer.

Therefore, Fukuyama argues that only high trust societies will be able to internalize the advantages derived from the development of information and communication technologies. The wide accessibility to continuously updated information systems is not sufficient to lead to the formation of dynamic and flexible forms of

networking between specialized firms. The formation of these networks requires the pre-existence of mutual trust. Therefore, only high trust societies will be able to exploit the new opportunities that the development of these technologies offer. In low trust societies the adoption of these technologies will be used to improve the efficiency of firms (internal organization).

The case of Sprintel, which we introduced in the first chapter, shows two things. The first is that the formation of dynamic and flexible forms of networking is based, as argued by Fukuyama, on the prevalence of mutual trust. The second is, in contrast with Fukuyama, that the prevalence of mutual trust may inhibit the capacity of a community to exploit the efficiency and effectiveness of these new technologies. Kumar et.al. (1998), in fact, explain the failure of Sprintel as being a consequence of the prevalence of mutual trust on the basis of common norms and values.

In our perspective, the capacity of high trust communities to internalize the efficiency and effectiveness derived from the adoption of common inter-organizational information systems depends on the nature of trust characterizing the community itself. Fukuyama, for instance, categorizes both Japan and North East Italy as high trust societies. However, there is a major difference between these two communities. Japan is a high-power distance society whereas North East Italy is a low-power distance one. In Japan trust is based on social roles. In North East Italy trust is embedded in personal relationships.

This distinction has major implications on the nature of communication processes. In high-power distance societies the structure and nature of communication processes and the meaning of information exchanged is largely codified.²¹ Therefore, the efficiency of Information and Communication Technologies (ICTs) can be exploited to improve the efficiency and effectiveness of communication and coordination processes between firms. For example, in the USA, which is a high-power distance society, car manufacturers have extensively exploited the ICTs to improve communication and coordination with their first tier of suppliers. On the contrary, in low-power distance societies the meaning of information and the basis of trust have to be continuously negotiated. Therefore, improvements in terms of information processing and transferring do not have any specific

²¹ In collectivistic societies there is no need to enforce cooperation between individuals. The common interest, in fact, prevails over the individual one. In individualistic societies, where the individual interest prevail over the collective one, cooperation has to be enforced through a system rules and authorities.

impact on the capacity of the community to create trust. The lack of richness of these types of media may reduce the capacity of the community to create mutual trust. Sprintel failed not only because of the prevalence of mutual trust within the community, as argued by Kumar et.al., but also because of the lack of media richness.

In this section we have reviewed the main contributions from an over-socialized perspective about the roles of ICTs as trust media. In the over-socialized perspective ICTs do not improve the capacity of firms to create trust, as opposed to the under-socialized view. Trust, in fact, is not simply based on information, but also on culture. Fukuyama argues that only high trust societies will be able to internalize the advantages derived from the development of computerized information systems. We have argued, however, that the prevalence of mutual trust is not sufficient to internalize the advantages of ICTs on its own. It is also necessary to focus on the specific nature of trust. We have introduced the distinction between high versus low power distance societies. We have argued that the automation of the communication process improves the process of trust creation only in high-power distance societies. In low-power distance societies, the lack of communication richness and interaction, which characterize the new types of media, may restrict the efficiency of the process of trust creation.

2.4.3 Embedded perspective

In the previous two sections we have reviewed the literature on trust and ICTs distinguishing, respectively, between under- and over-socialized perspectives. Under- and over-socialized perspectives are at the two opposite extremes of a single continuum. In the under-socialized perspective, the wide access to continuously updated information systems drastically reduces the cost of lengthy trust building processes based on mutual experience. In the over-socialized perspective, on the other hand, the efficiency and effectiveness of computerized information systems depend on the trust-characteristics of the community.

The embedded perspective lies between these two alternatives. It highlights that the development of computerized inter-organizational information systems strengthens the efficiency and effectiveness of the relationship between firms and, therefore, the development of mutual trust between them. However, it also highlights that the development of computerized information systems is not sufficient to sustain the

development of mutual trust between firms, which has to be supported on the basis of continuous and intense face-to-face interaction. Face-to-face interactions are required to sustain negotiations and developments of shared understandings and commitments within relationships.

Nohria and Eccless (1992) argue that “network organizations are not the same as electronic networks, nor can they be built entirely on them (pag. 289)”. There is no doubt that information and communication technologies have played and continue to play a prominent role in the emergence of networks of firms. However, scholars that emphasize only the technological dimension of these networks share an information processing view of the organization, often ignoring its social dimension.

The social dimension is crucial in networks of firms because the type of coordinated action that is required is rarely routine. This type of coordinated action requires the ability to operate under conditions of great ambiguity both in terms of purpose and means. The main activities characterizing daily life within networks of firms are negotiating and sharing the understanding of the context, discovering sources of information, selecting partners, developing new norms and rules for further action and monitoring progress toward common goals. The development of common inter-organizational information systems may increase the efficiency of these activities, but their effectiveness depends crucially on face-to-face interactions, which are required to reinforce social commitments (Nohria and Eccless, 1992).

Hart and Saunder (1998) focus on the factors supporting the development of electronic partnerships based on EDI between customers and suppliers. They focus on the interplay between two factors: trust and power. They distinguish between persuasive and coercive power. Persuasive power is the use of persuasion to convince counterparts about the mutual benefits that derive from jointly investing in EDI. Persuasive power also comprises of providing financial and technical support in the development phase or negotiating better conditions of access to the network infrastructure. Coercive power is the explicit use of bargaining power to impose the adoption of EDI. The contractual power of one party over a counterpart depends on the market share and the percentage of the annual turnover held by the party and the level of specific investments made within the

relationship. The party that makes explicit reference to his or her contractual power in order to impose EDI on his or her counterpart is exploiting coercive power.

Hart and Sounder (1997) argue that the decision to enter an electronic partnership is mainly based on power. The decision to extend and continue the electronic partnership depends mainly on mutual trust, which is required to reduce the risk derived from sharing valuable information between buyers and suppliers. The development of an EDI partnership begins with the application of EDI to the order-cycle. It may expand to the payment-cycle. It may conclude with co-designing of products. The level of risk involved in each of these stages increases. Therefore, mutual trust is required in order to reduce the risk perceived.

Hart and Sounder show that the development of the electronic partnership depends on the type of power adopted. Coercive power is negatively correlated with the development of the electronic partnership. Persuasive power, on the other hand, is positively correlated with the development of mutual trust and indeed with the further development of the electronic partnership. It should also be noted that the probability of success of an EDI project depends on the type of power adopted. The adoption of persuasive power increases the probability of the success of the project, which in turn strengthens the relationship of mutual trust between the parties.

Hart and Saunder (1998) also highlight the positive influence exercised by the network firms in deciding to adopt EDI. For instance, the information that a competitor has already adopted EDI positively influences the decision of others to invest in EDI. The same effect is produced when a potential new customer decides to invest in EDI. The influence of the network on the decision to adopt a specific technology or standard is known as network externality. The concept of network externality refers to the observation that the diffusion of certain technologies, typically networking technologies, does not simply depend on the economic value of the technology itself, but also on the number of early adopters (Shapiro and Varian, 1999). The typical example is that of the telephone. The added value of the telephone does not simply depend on the quality of the service provided, but also on the number of people already connected.

Therefore, the trust that users place on a specific technology does not simply depend on their knowledge of that technology, but also on the trust others place on it. Tan

and Thoen (2000) use the term commonality trust in order to emphasize the influence of others on the decision to trust a specific technology. Therefore, a technology is trusted simply because it is trusted by the majority. There are many examples that show the relevance of this phenomenon. People trust credit cards not only because they are fully conscious of their functionalities, but also because the majority do.

In this section we have reviewed the embedded perspective on the role of information and communication technologies as a media for trust. This perspective proposes an intermediary position between under- and over-socialized perspectives. It recognizes the positive role played by information and communication technologies in sustaining the development of mutual trust within networks of firms. However, it emphasizes that information and communication technologies *per se* are insufficient to sustain the development of mutual trust based on personal relationships. Furthermore, the embedded perspective also highlights the key role played by the network in influencing the individual decision to trust a specific technology or standard.

2.5 Trust media in open electronic commerce

In the previous section we focused on the role of information and communication technologies as a media for trust. The aim of this section is to review some of the major technologies that are used to support trust between transacting parties in open electronic commerce. The term open electronic commerce refers to the opportunity to do business over digital networks between firms that do not know each other and do not have any previous experience of doing business together (Lee, 1999). We refer mainly to the case of business-to-business relationships. From this perspective we distinguish between two levels of analysis. The first is trust at the data level, which refers to the mechanisms that ensure the trustworthiness of the data exchanged between firms. The second is trust at the business level, which refers to the technological solutions proposed to prevent and detect opportunism and verify firms' reputations.

2.5.1 Trust at the data level

The origin of the concept of trust in the field of information systems can be traced back to the problem of ensuring the interchange of strategic information between parties.

This problem is not new. The Romans made use of cryptographic techniques to protect the confidentiality of strategic messages. The novelty of the problem is linked to the drastic reduction in the costs of falsifying identity and manipulating information. The trustworthiness of the information exchanged over digital networks has been guaranteed, until recently, by global network service providers. With the development of the Internet, which is a network of networks, the issue of ensuring the trustworthiness of the information exchanged between firms has become a central issue. On the Internet there is not a central authority that guarantees the trustworthiness of the information exchanged. On the Internet information goes through several independent service providers, which do not know each other and, therefore, do not trust each other. This section, therefore, focuses on the mechanisms that are implemented to ensure the trustworthiness of information exchanged over the Internet.

Ensuring the trustworthiness of information exchanged over the Internet means that the following seven requirements are satisfied: non-repudiation, authentication, integrity, confidentiality, uniqueness, time stamping and availability (Ford and Baum, 1997). The first requirement (*non-repudiation*) states that both the content of information exchanged and the participation in a communication process should be irrefutable. Therefore, it should be possible to verify, on the one hand, the identities of the sender and receiver (*authentication*) and, on the other hand, that the information exchanged has not been intentionally or unintentionally modified during the transmission (*integrity*). *Confidentiality* refers to the protection of personal data from unauthorized disclosure and access. *Uniqueness* refers to ensuring the existence of a unique copy of specific documents. This requirement is compulsory only in the case of negotiable titles of ownership. *Time stamping* refers to the possibility of verifying the time of submission or receipt of a document. This is compulsory only in the case of documents that have to be received or sent within a given time and date. Finally, *availability* requires the guarantee of accessibility to a given set of data once the identity and the authorization of the party have been verified.

The most important principle from a business perspective is the one of non-repudiation. Non-repudiation is required in order to ensure the legal value of business

documents. Digital signature provides the solution.²² The digital signature is a data item enclosed with the document, which authenticates the identity of the sender and verifies the integrity of the document. It is based on an asymmetric algorithm of encryption, which is based on two keys: private and public. The sender, in order to generate his digital signature, encrypts the original document with his private key. The sender encloses the digital signature with the original message. The receiver, in order to verify the identity of the sender and the integrity of the document, applies the sender's public key to the sender's digital signature. The correspondence between the original message and the decrypted digital signature authenticate the sender's identity and the integrity of the document.

The functionality of the digital signature requires the sharing of information about the identity of the public key's owner. If parties already know each other this operation can be easily done, for instance, through face-to-face or phone communication. However, between parties that do not know each other this operation becomes far more complex. This is not a problem of communication, but a problem of trust. In fact, two parties, who do not know each other, and exchange their respective public keys, have no means of verifying their respective identities. Therefore, developing a public-key infrastructure, which is commonly known as trust infrastructure, has solved this problem. The function of this infrastructure is to allow public-key users to verify not only the identity of the counterpart, but also the value of their public-key, such as when it was issued and if it is still valid.

The public key infrastructure is a network of trusted relationships between a set of parties that provide information relative to the identity and the value of any public key (Ford and Baum, 1997). There are two models of public infrastructure: hierarchical-based and web-based. The hierarchical system is based on a hierarchy of certification authorities, which certify the public keys of their subordinates and users. In the web-based model the users directly certify the level of trustworthiness of their counterparts' public key. The functionality of the system resembles the functionality of a network of individuals sharing information about their previous experiences of interaction with specific counterparts.

²² The digital signature in itself is not sufficient to validate all the requirements listed in the previous section. Additional trusted third parties services are required. These are mainly certification service for the time of submission, proof of delivery and uniqueness. Another important service is the one of notary, which plays the same function of a real notary. It previously verifies the state of ownership of the properties and than register the transaction.

Therefore, it is based on the principle of transferability of trust from one relationship to another. This system is based on a language that is used to classify each other's level of trustworthiness.

The major difference between the two systems is in terms of flexibility. In the hierarchical system the value of the digital signature is bureaucratically controlled. However, the major limitation is that power is centralized. Therefore, if the highest level of authority is compromised the trustworthiness of the entire system is corrupted. In the web-based system each user can rely on others' experience to develop trusted relationships. The major limitation, however, is that users may not share the same understanding of trust. Introducing a common standard to classify the level of trustworthiness experienced within relationships can solve this problem.

2.5.2 Trust at the business level

The recent development of open infrastructure for electronic commerce has triggered off a new set of problems linked to trust. It is clear, in fact, that the possibility of validating the identity of counterparts and non-repudiating business documents is insufficient to foster trust within business transactions. If the opportunity to do business over digital networks is limited within a community of familiar business partners there is no need to support the development of trust. The reputation of the participant is already known. However, if the business context is open to "strangers" than there are problems of managing reputation and ensuring the trustworthiness of business transactions.

Trust at the business level refers to the formalization of mechanisms to support the development of trust within transactions. We have highlighted that there are three mechanisms that ensure trust within business transactions: structural and procedural constraints, standards of selection and control, and insurance-like arrangements.

These mechanisms are already diffused within the electronic market. The proliferation of electronic business transactions between firms has strengthened the value of standards that certify the quality and financial trustworthiness of companies, such as ISO 9000. For instance, in order to enter the stock market companies are required, every three months, to provide a certified financial statement. From this perspective we can distinguish between

two categories of standards: public and private. The first are sponsored by public institutions, such as ISO. The second are sponsored by single firms, associations between firms or private agencies, such as Standards and Poor. In the latter case it is the market that determines the trustworthiness of the standard. The reputation of Standards and Poor, for instance, depends on its capacity to produce and sell reliable information about the reputation of firms and countries. There is no central authority certifying the trustworthiness of Standards and Poor.

The development of the Internet has stimulated the diffusion of reputation systems (Resnick et.al. 2000). These are peculiar mechanisms of selection, which are based on the collection, distribution and aggregation of feedback about parties' past behavior. This system is based on peer-to-peer reviewing. Each participant in a business transaction evaluates the performance of his counterpart. The information collected can be used in order to evaluate the trustworthiness of a specific counterpart and decide to do business with him or her. Furthermore, it should be noted that reputation systems are not only useful in detecting opportunism, but also in preventing it. Parties, knowing that their record of past behavior will be the basis of evaluating their trustworthiness in the future, are stimulated to behave trustworthily in order to increase the probability and value of future transactions.

The efficiency of reputation systems depends on two factors. The first is that the future existence of the reputation system is guaranteed. In fact, if we expect that the system will fail in the near future we do not have any incentive to behave trustworthily in the present. The second is that the truthfulness and honesty of feedback must be guaranteed. For instance, a group of sellers may collaborate to provide false positive feedback about each other's past performance in order to improve their reputation and value in the system. Consequently, they can use their false reputations to exploit other participants.

Another mechanism to sustain trust between transacting parties at the business level is the designing of trustworthy trade procedures. The trustworthiness of electronic business procedures depends, according to Bons (1997), on the existence of a sufficient number of structural and procedural constraints to minimize, *ex-ante*, the risk of opportunism. Bons (1997) has developed a decision support system to audit the trustworthiness of electronic

business procedures. The utility of this system is to support designers and users of electronic business procedures in validating their trustworthiness.

This system is based on the assumption that business transactions can be modeled as networks of speech-acts between inter-organizational roles, such as buyer and seller.²³ This theory is based on the fundamental observation that words are not only used to make claims about the world, but also to change the state of the world (Austin, 1962, Searle, 1969). The typical example is the one of a priest pronouncing a marriage. The priest that marries a couple creates a new legal status. The validation of this state requires a set of preconditions to be true, such as the priest has to be entitled to pronounce a marriage.

Speech-acts are common in the legal world (Dewitz 1992). For instance, a seller promising to deliver goods within fifteen days does not simply state that he or she will do it, but also that he or she is taking a legal obligation to do it. This means that if the seller does not do it, the buyer is legally entitled to seek compensation. Business procedures, therefore, can be represented as a network of legal speech-acts between two or more organizational roles, such as buyer and seller. Lee, for instance, has developed a formal language to model inter-organizational business procedures on a sequence of legal speech-acts between multiple roles. Bons (1997), on the basis of these languages, has modeled five generic principles that, if satisfied, ensure the trustworthiness of business transactions.

2.6 Conclusion

The aim of this chapter was to review the literature on trust and the role of information and communication technologies as trust-media. We have argued that in the literature there is agreement on the definition of trust. Therefore, we have focused on the alternative perspectives of trust. We have relied on a categorization proposed by Granovetter (1992). This categorization distinguishes between three perspectives: under-socialized, over-socialized and embedded (see tab. 2.2). Each of these perspectives is characterized by a specific assumption on the nature of human rationality. The under-socialized perspective is based on the assumption of self-interest seeking rationality. Therefore, individuals are assumed to behave in order to maximize their own self-interest. The over-socialized perspective is based on the assumption of normative rationality.

²³ See among other papers available on the Euridis web site (www.euridis.fbk.eur.nl), Lee (1988) and Lee and Bons (1996), and Lee (1999).

Therefore, individuals behave according to a set of norms and values individually internalized, but shared within a community. Finally, the embedded perspective is based on the assumption of network rationality. Therefore, there is mutual interdependence between individuals' behavior and the behavior of the network as a whole.

The distinction between these three assumptions has a major impact on the nature and conceptualization of trust within each of the perspectives. In the under-socialized perspective trust is based on information and calculation of the risk involved in trusting a counterpart. In the over-socialized perspective trust is a positive norm of behavior shared between the members of specific communities. In the embedded perspective trust is an evolving norm of behavior embedded within specific relationships. Therefore, trust is embedded on the basis of specific experiences of interaction between two parties. The cohesiveness of the network structure, where a specific relationship is embedded, facilitates the circulation of information about parties' reputation and the socialization of common behavior.

The three perspectives are also characterized by different strategies to sustain trust. In the under-socialized perspective, trust has to be enforced through a formal system of authorities. The function of this system is to prevent, detect and punish opportunism. In the over-socialized perspective, trust is based on the internalization of common norms and values. The internalization of these norms and values is based on the socialization within a community. In the embedded perspective trust is based on interaction and socialization within a network of social relationships. The function of the network is not only to stimulate the internalization of existing norms and values, but also to support their creation and evolution.

The role of information and communication technologies as a media for trust also differs in each of the perspectives. In the under-socialized perspective, information and communication technologies reduce the cost of lengthy trust-building processes based on mutual experience. In the over-socialized perspective, trust is a norm of behavior based on culture and history. Therefore, information and communication technologies do not have any major impact in sustaining the development of mutual trust. The embedded perspective recognizes the efficacy and effectiveness of information and communication technologies

as a basis for trust. However, it also highlights that these technologies are currently insufficient in sustaining the socialization and internalization of common norms and values between individuals and firms.

	RATIONALITY	TRUST-BASE	TRUST-MECHANISMS	THE ROLE OF ICT
UNDER-SOCIALIZED	Self-interest seeking rationality	Information and calculation of risk involved	Formal rules and authorities to prevent, detect and punish opportunistic behavior	Substitutes for length trust building process based on mutual experience
OVER-SOCIALIZED	Normative rationality	Shared norms and values	Internalization of common norms and values	The impact of ICT depends on trust character of the community
EMBEDDED	Network Rationality	Experience of interaction embedded with networks of social relationships	Internalization and socialization of common norms and values within network social relationships	ICTs improve the efficiency and effectiveness the process of trust creation, but are not sufficient to sustain the socialization and internalization of common norms and values within a community.

Tab. 2.2 Summary of the main points of this chapter.

3 THE PROCESS OF TRUST CREATION: THEORY DEVELOPMENT

The first chapter focused on the problem of sustaining the creation of trust between local and global systems. Local and global have been defined in terms of cognitive distance between “places”. We distinguished between tacit and codified knowledge. Local was defined as the place where knowledge is mainly shared on a tacit basis. Global was defined as the place where knowledge is mainly shared on the basis of an explicit exchange of information. Solving the problem of sustaining the creation of trust between these two dimensions requires the understanding of how trust is created. The aim of this chapter is twofold. The first is to develop a model of the process of trust creation. The second is to interpret this model with respect to the case of the interaction between local and global.

The starting point for our model of trust creation is the theory of knowledge creation proposed by Nonaka and his group. Nonaka’s theory, as we shall see, is based on the distinction between tacit and codified knowledge (Nonaka, 1993; Nonaka and Takeuchi, 1995; Nonaka and Konno, 1998). From this perspective, Nonaka argues that knowledge is the product of the interaction between tacit and codified components of knowledge. The capacity of an organization to create knowledge depends on the nature and structure of the process of interaction between these two sources of knowledge and,

therefore, between inside and outside. Inside and outside can be defined only in relative terms. Inside can refer to a single individual and the outside to his or her team. Inside can refer to a team and outside to the organizational context where the team is embedded. Inside can be a single firm and outside its relative network of firms. Inside can be a network of firms and outside the industry where this network is embedded.

Nonaka argues that the process of knowledge creation is structured into four phases: socialization, externalization, combination and internalization. Socialization takes place inside. It refers to the process through which knowledge is socialized within a specific context. Combination takes place outside. It refers to the process through which different sources of codified knowledge are integrated and combined together. Externalization and internalization take place between inside and outside. Externalization refers to the process through which tacit knowledge is converted into codified knowledge and “exported” outside. Internalization, on the other hand, refers to the process through which codified knowledge is “imported” from outside and converted into tacit knowledge, which is appropriable within the organization.

We aim to show that trust is a specific form of knowledge. Therefore, trust is the product of the interaction between tacit components, which are embedded within a specific context, and codified components, which are embedded within shared mental or physical artifacts. Therefore, the capacity of a system to create trust between inside and outside depends on the structure of the interface between these two dimensions.

3.1 The process of knowledge creation

The theory of knowledge creation is based on a constructivist approach (Nonaka and Takeuchi, 1995; Troilo, 2001). This approach contrasts with the rationalistic one. The rationalistic approach argues that true knowledge is only that which abstracts from the value of personal, social or cultural beliefs. It is based on the assumption that there is an objective truth (reality) against which the value of our beliefs (knowledge) can be measured. The constructivist approach, on the contrary, is based on the assumption that reality is in itself a social construction. It does not exist as an objective reality, which abstracts from individual and collective perceptions. Our perception of reality is influenced by pre-existing assumptions/beliefs embedded in the background (Winograd and Flores,

1986). Therefore, the truthfulness of knowledge can not be completely separated from its specific background context.

The constructivist approach is based on the distinction between tacit knowledge, which is embedded within our individual or collective background, and codified knowledge, which is shared between contexts (see table 3.1) (Polanyi, 1962). The value of codified knowledge abstracts from the specificities of any context. Therefore, it is commonly and globally accepted. We can distinguish between different degrees of tacitness. Tacit knowledge can be rooted on the value of personal beliefs and experiences (tacit knowledge). It can be embedded within systems of beliefs characterizing specific networks of interpersonal relationships (embedded knowledge). It can be based on systems of beliefs characterizing the members of specific communities (en-cultured knowledge).

Tacit Knowledge (Subjective)	Codified Knowledge (Objective)
Knowledge of experience (Body)	Knowledge of rationality/code (Mind)
Simultaneous knowledge (Here and now)	Sequential knowledge (There and then)
Analog knowledge (Practice)	Digital Knowledge (Theory)

Table 3.1: Tacit versus Explicit knowledge (Adapted from Nonaka and Takeuchi, 1995)

The distinction between embedded and en-cultured knowledge is tied to the fact that the value of the first is embedded on specific relationships between a number of parties, whereas the value of the second is shared by community members. En-cultured knowledge, therefore, does not depend on the specific identity of the parties, but only on their affiliation.

Tacit and codified knowledge are characterized by different degrees of transferability. Tacit knowledge is transferable only within the specific context where it has been created. Embedded knowledge, for instance, is transferable only within the specific network of interpersonal relationships where the value of the background assumptions is already shared. En-cultured knowledge, on the other hand, can be transferred only between members of a specific community. Codified knowledge, on the contrary, is globally accessible. Its value, in fact, is based on a set of explicit assumptions, which are commonly accepted independently from the specific membership of the parties.

Nonaka argues that the capacity of a firm to create value is tied to its capacity to transform the potential value of knowledge embedded inside the firm into external value, which is appropriable outside of the firm itself. Therefore, firms, in order to create value, are required to codify their embedded knowledge in a format that is appropriable outside of the firm. However, the capacity to translate internal value, which is embedded within the firm, into external value requires internalizing that part of the knowledge that is necessary to make that value explicit.

For instance, the value of a mobile phone is tied to the existence of a common communication standard, which is diffused. A firm creating an innovative mobile phone, which does not comply with the standard, will not be able to internalize the value associated with that specific knowledge. In order to internalize the value associated with the new product, firstly the firm has to internalize the knowledge of the standard, which is located outside, and then design the new product according to the rules of the standard. The firm can take the risk of developing a new non-standard product (radical innovation), but it also has to bear the costs associated with the diffusion of the newly developed standard. However, if the newly developed standard is diffused the firm will realize higher profits than if it simply conformed to the existing standard, such as in the case of Microsoft (Shapiro and Varian, 1999).

Therefore, there is a trade-off between openness and control (Shapiro and Varian, 1999). The profits deriving from the diffusion of an open standard are shared between the sponsors of that standard according to their respective market shares. The profits deriving from the diffusion of a proprietary standard, on the contrary, are fully internalized by the firm that controls the standard. Therefore, a firm that wants to support the diffusion of a new standard has to decide between opening the standard to its competitors or controlling it directly. In the first case the firm aims to minimize the risk associated with the diffusion of the new standard. In the second case the firm aims to maximize its own profits.

The process of knowledge creation, according to Nonaka, is structured in four phases: socialization, externalization, combination and internalization. *Socialization* takes place inside a team, firm or community. It is based on the direct interaction and cooperation between affiliates. Members, through their daily experience of being together, develop common perspectives about the world and common cooperative routines/behavior.

The key question is who should be allowed access to the standard. Linus Torvalds, in order to socialize his business idea, has “opened source” his first release of Linux to anyone who wants to contribute to its further development. He did not realize any profit out of his business idea, but he gained a reputation that enabled him to offer consultancy to firms.

The process of *combination* takes place outside. In this phase different standards and technologies are integrated to strengthen compatibility between contexts, which are characterized by different technologies and standards. The outcome of this phase is the development of a new standard, which should abstract and integrate the specificities of any single standard. EDIFACT, which is a common standard in exchanging electronic business documents between firms, aims to develop a universal standard that will integrate the specificities and practices of each country and firm. The aim is to reduce switching costs and, therefore, the costs of integration between firms.

Externalization and internalization take place between inside and outside. The process of *externalization* refers to how knowledge is exported from inside to outside. For instance, a firm may incorporate its knowledge within a product or it may simply provide a set of guidelines to develop a new product. Microsoft, for instance, incorporates its knowledge within software packages. Sun Microsystems, on the other hand, sells its Jini technology to a “gated community” of developers (Sawhney and Prandelli, 2000). Jini is a network standard that allows computers and other devices like televisions and printers to “federate” into a single distributed system. Sun invented the standard, but “closed sourced”, within a closed community, the development of its potential applications. Therefore, Sun controls the standard and compatibility between applications. However, it has “closed sourced” the development of applications to reduce costs and stimulate innovations on the application side.

The process of *internalization* refers to how knowledge is imported from outside. For instance, a firm may incorporate knowledge through the acquisition of a new production machine or, alternatively, acquire the intellectual, human and social capital necessary to internally produce that machine. The two solutions differ in terms of flexibility. In the first case the firm has acquired a closed package of functionalities, which is hard to modify and adapt to the specific requirements of firms. It is the firm that has to adapt to the new technology and not *vice versa*. In the second case the company can fully

adapt that technology to firms' requirements. Between these two extremes there are a number of alternative ways to structure the process of internalization between inside and outside. Knowledge can be internalized in the form of a modular package, which can be configured according to specific clients' requirements. The development of that knowledge can be outsourced to a community of partners that can also sell on that knowledge to other parties.

In this section we have reviewed the theory of knowledge creation proposed by Nonaka and his group. Figure 3.1 shows that the outcome of the process of knowledge creation is a spiral. Knowledge is the product of social interaction between individuals, firms, communities and so forth. In this process knowledge is converted from tacit to explicit and back to tacit again. This process is structured in four phases: socialization (from tacit to tacit), externalization (from tacit to explicit), combination (from explicit to explicit) and internalization. Socialization takes place mainly inside a team, firm or community. It is based on the direct self-involvement of the participants. Combination takes place outside. It is based on the integration of different components of codified knowledge. This integration is based on common codified standards, which abstract from the specificities of any local standards.

Externalization and internalization take place between inside and outside. Externalization is the process through which inside knowledge is converted into codified knowledge, which is exportable outside. This phase is based on dialogic reasoning between team-members. Team-members negotiate the meaning of their experiences and translate them into codes, which is appropriable outside the team itself. Internalization is the process through which knowledge is converted into tacit knowledge, which is appropriable inside the system. This process is based on learning by doing. Team-members, through experience, develop a set of compatible practices, which are adapted to the new knowledge imported within the system. The capacity of a system to import, export and create knowledge depends on the specific structure of the interaction between inside and outside. The goal is to balance aperture and closure or, in other words, tacitness and codification in such a way that the system is able to learn from outside, but to maintain its specific characteristics.

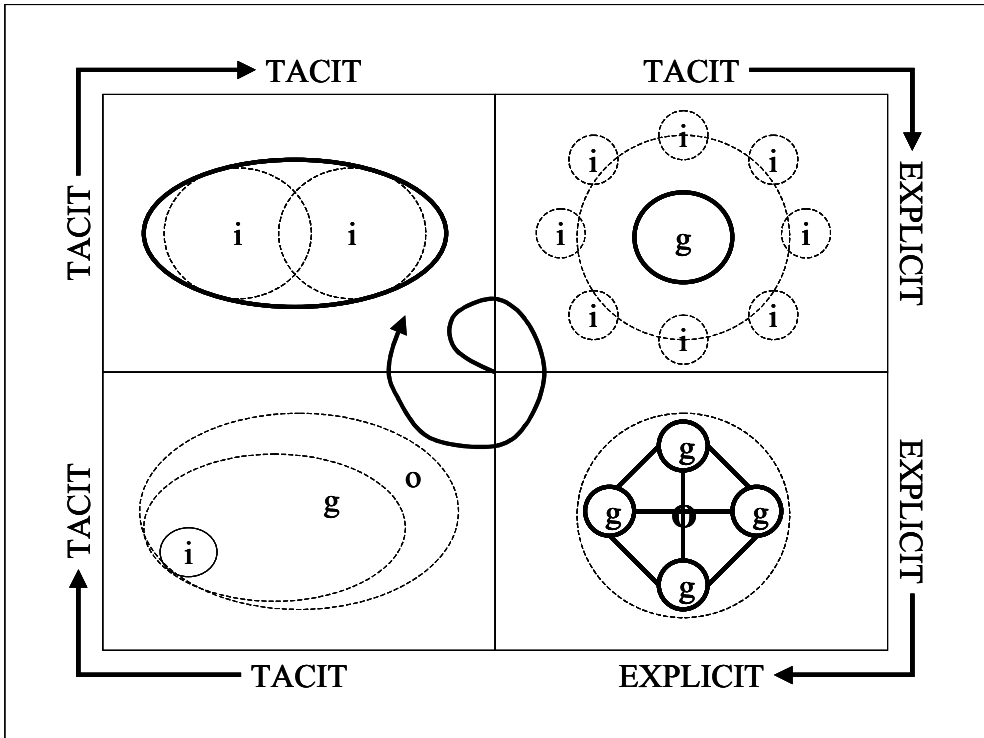


Fig.3.1.: The process of knowledge creation (Nonaka and Konno, 1998).

3.2 The model of trust creation

In the previous section we introduced the theory of knowledge creation. In this section we show that trust is the product of a process of knowledge creation. Trust and knowledge are both based on beliefs. The two concepts differ mainly in terms of degree of certainty that we, as individual and society, assign to the value of these beliefs. We claim to know something, if we believe we have enough evidences for the truthfulness of that something. We claim to trust something, if we expect (justified beliefs) that something to be true, but we do not have enough evidences for its truthfulness. Trust and knowledge, therefore, can be conceptualized as part of a single process of learning/knowledge creation, through which we create our beliefs about society.²⁴

Trust can also be divided into tacit and codified. *Tacit trust* is embedded within the background history of individuals, relationships or communities. The over-socialized

²⁴ See Luhmann (1979).

perspective shows that trust is an internalized norm within a community. Trust is tacit because its value is based on the background history of a community. The embedded perspective argues that trust is a specific norm that develops within relationships and networks of interpersonal ties. Trust, from this perspective, is tacit because it is embedded in the background interaction between members of specific networks.

There are different degrees of tacitness. In the over-socialized perspective trust is *en-cultured*. The basis of trust is affiliation. The value of trust does not depend on specific relationships or cohesiveness of the network. It is the standard basis of trust that is shared between two generic members of a specific community. In the embedded perspective, however, the value of trust depends on specific relationships and cohesiveness of the network structure. The identity of the members involved adds value to the generic base of trust that is normally shared between community members.

Codified trust is integrated within formal rules governing interaction between parties, who may or may not belong to the same community. In the under-socialized perspective trust is based on self-interest. Therefore, individuals trust each other if they believe that it will be profitable for themselves and their counterparts. In order to structure trust and cooperation between individuals, institutions define a set of rules that should govern the interaction between members playing a certain role within the organization or in the society. The value of codified trust is not associated with the specific context or the identities of the parties involved, but it is based on the specific assumptions made on the nature and characteristics of the organizational roles involved. The value of codified trust has to be enforced. Institutions, in order to enforce the value of trust, define a set of penalties for those who do not behave as expected and design control systems to monitor trustworthiness and opportunism.

Trust is created in four phases: socialization, externalization, combination and internalization.

Socialization takes place inside a group or community. It is based on the direct interaction between members. The embedded perspective argues that it is the direct and interpersonal experience within a network or community that stimulates the formation and reproduction of norms and values. Individuals' social capacity, however, is limited.

Therefore, the process of socialization is effective only within small groups or communities. When the number of members belonging to a community becomes too large, or there are numerous encounters between members of different communities, trust has to be codified. It must be converted into a set of impersonal rules.

Zucker (1986) argues that the development of impersonal or institutional trust in the USA took off as a consequence of the mobility generated by the economic crisis of 1929. Before then, US society was organized on the basis of “cultural clusters”, such as Chinatown and Little Italy. Even at the macro-level there were ethnic majorities in each state. This mobility produced a dramatic increase in the number of encounters between “strangers”. Therefore, communities were no longer sufficient to govern trust. This gave a stimulus for the development of a set of common and codified institutions and rules for governing trust between strangers.²⁵

Combination takes place outside the team or community. In this phase different standards of trust are combined and integrated to support cooperation between communities. This phase produces new standards, which should be abstracted and integrated into the specificities that are embedded within each local system. The European Union is an example of an integrator. Its function is to develop common standards and rules to support the interaction and cooperation between member states. Another example is the European Central Bank, which governs the value of the Euro. This integration can take place at different levels of abstraction. For instance, the national government integrates the activities of single regions and so forth.

²⁵ It should be noted that Putnam (1995) highlights the unintended effects deriving from the institutionalization of trust within USA society. He shows that the institutionalization of trust has reduced the capacity of USA society to sustain the development of networks of social and civic engagements. In order to support his argument Putnam provides a number of statistics, which show the reduction in the number of USA citizens participating to local associations. He shows, for instance, that the number of citizen voting, which represents the basic element of civic engagement in modern society, has drastically reduced in the last quarter of the last century. Furthermore, he also highlights the progressive professionalization of the so called third sector as undermining the foundation of civic engagement. Members of these associations do not actively engage on and participate to the life of these associations. They simply send a check on an annual basis. Therefore, these associations do not play anymore the role of incubators for the creation of social networks of trust between citizens. The argument of Putnam is similar to the one of Giddens (1990). Giddens argues that the development of modern society has been characterized by the progressive rationalization and professionalization of trust. The progressive diffusion of these trust mechanisms has produced, on the one hand, a progressive reduction of the social distance between parties located into different palaces/social contexts, but, on the other hand, a progressive increment of the social distance between parties located into the same place.

Externalization and *internalization* take place between inside and outside. Externalization is the process through which local trust, which is embedded within a specific community, is exported outside the community. This process can be organized in different ways. The local basis of trust can be packaged within a product that has certain qualitative characteristics directly observable outside the system. For instance, a brand name enables a firm to differentiate its products from those of its competitors. Therefore, brand names are a system that enables clients to recognize and share experiences about the quality of a certain product.

The value of the local basis of trust can be certified according to specific standards, which are accepted as a symbol of trust within the global system. For instance, the ISO 9000 standard certifies the quality of the internal processes within an organization. Therefore, a firm that provides an ISO 9000 certificate shows to its counterparts that its internal processes comply with the requirements of the standard. The guarantor for the value of this certificate is a trusted third party. The reputation of the third party adds value to the certificate itself. For instance, it makes a difference if we know that the certificate has been issued, for example, by Deloitte or Price Waterhouse Cooper rather than by an unknown consultancy firm. The reputations of Deloitte and Price are well known and, therefore, the quality of their standards is also known.

Internalization refers to the process through which global and codified standards of trust are imported and converted into local practices. The question is how is it possible to make sure that the rules that are codified within a standard of trust are converted into appropriate behavior that conforms to the standard.

3.3 Governing trust between local and global systems

In the previous section we develop a model of trust creation. This model is based on the idea that trust is a kind of social knowledge. The creation of trust is based on the conversion of local practices of trust into codified standards of trust and, vice versa, the conversion of codified standards of trust into local practices. The key question, from this perspective, is how it is possible to sustain the development of this process. In the first chapter we argue that sustainability cannot be achieved through standardization, but only through the creation of compatibility between local practices and global standards of trust.

The goal, from this perspective, is to design an infrastructure that sustains the capacity of local systems to mutually learn from each other. In order to further develop this idea is useful to rely on Boisot's conceptualization of codification and abstraction (Boisot, 1995, 1998).

Codification is the process through which the instances of a certain phenomenon are mapped into a number of categories, which are representatives of the phenomenon itself. For instance, the quality of a specific vegetable can be measured in terms of weight, size, color, shape and so forth. Abstraction, instead, is the process through which the number of these categories is reduced to a minimum. In the case of the vegetable for instance, size and weight are strongly correlated. Therefore, we may consider only one of these two categories in our definition of the vegetable's quality.

The process of codification, from this perspective, is mainly the product of the accumulation of experiences. Decision-makers, every time they are faced with a new instance of a specific phenomenon, create a new category representing that specific instance. Proliferation in the number of categories associated to a given phenomenon, however, increases the complexity of the decision-making process. The difference between categories, for instance, may become fuzzy. Therefore, the categorization is not anymore useful to decide, for instance, whether or not a vegetable is of good or bad quality. The process of abstraction, differently, is mainly a mental process. It acts on existing categories and it aims to reduce them to a number that is feasible to process for the decision-maker.

The process of codification and abstraction has a major advantage. It reduces the costs associated to the elaboration of data and information. However, there is also a price to pay. Reducing the number of categories results in the reduction of the capacity to perceive the complexity of reality. The same argument applies to trust. Decision makers, for instance, may decide to use only two or three categories to evaluate the trustworthiness of counterparts. This simplifies enormously the process of decision-making. However, it reduces the capacity to learn from experience. If the counterpart does not satisfy the two decision-maker's requirements, the decision-maker will never have the opportunity to learn whether or not the counterpart was really trustworthy because he will not have the opportunity to interact with him.

Therefore, there is a trade off between codification/abstraction and de-codification/concreteness. This trade off depends on two factors: the cost of processing information and the cost of missed opportunities. If the decision-maker restricts too much the number of categories that he or she applies to evaluate counterparts' trustworthiness, it might result in a situation where none of them does satisfy these requirements. Therefore, he or she does not have any opportunity to interact with others and establish trusted relationships.²⁶ On the other hand, if the decision-maker enlarges too much the number of categories, he or she might be incapable in deciding whether counterparts are trustworthy. From this perspective, it is likely that the cost of opportunism, as consequence of adverse selection, is going to be high.

The only way out from this trade off, as we shall see in the case of loosely coupling systems (chapter 8), is to create a network of local integrators, which are embedded into specific social contexts/communities. The major advantage of this solution is that enable decision-makers to save on the number of categories necessary to evaluate the trustworthiness of parties embedded within specific local systems. Local integrators, in fact, will use their experience of embeddedness to cover the distance between the abstract code adopted and the reality of the context of interaction. The sustainability of this model depends on two conditions. The first is that there should be competition between local integrators embedded in a community. The lack of competition, in fact, may stimulate local integrators to opportunistically exploit the loose specification of the global standard of trust. The second is that there should be a transnational organization between local integrators devoted to the codification of local experiences and rationalization of standards. The transnational network between local integrators, in other words, should be able to learn from local experiences of trust and opportunism in order to sustain the development of the code adopted to shared and transfer trust between communities.

3.4 Conclusion

In this chapter we have proposed a model of the process of trust creation. This model is based on the assumption that trust is a specific form of knowledge and, therefore, the product of a process of knowledge creation. From this perspective we have shown that

²⁶ See also Luhmann (1979)

trust can be categorized into tacit and explicit. Furthermore, we have also shown that trust evolves as a consequence of four phases: socialization, externalization, combination and internalization. The capacity of creating trust between local and global is dependent upon the specific level of codification chosen to integrate the two systems. In the next section we will analyze five case studies of integration between local and global systems of trust, so that we can better understand what alternative solutions are available.

PART II

EMPIRICAL ANALYSIS

THE CREATION OF TRUST BETWEEN LOCAL AND GLOBAL SYSTEMS: THE CASE OF ITALIAN INDUSTRIAL DISTRICTS

4 THE CREATION OF TRUST BETWEEN LOCAL AND GLOBAL SYSTEMS: INTRODUCTION TO THE EMPIRICAL ANALYSIS

In the first part of this thesis we developed a model of trust creation between local and global systems. This model makes a distinction between four phases: socialization, externalization, combination and internalization. We argued that local trust is created on the basis of socialization and internalization of common norms, values and experiences between members. Global trust is based on the externalization and combination of common rules and codes, which are appropriable by non-members. We argued that the sustainability of the model of trust creation between local and global systems depends on the level of coupling between local and global processes of trust creation. The higher the degree of decoupling between these two processes the more local and global systems are mutually inaccessible. The higher the degree of coupling between these processes the more local systems tend to lose their identities and conform to global standards.

This second part of the thesis has two major aims. The first is to explore what are the alternative models of interfacing local and global creation of trust. The second is to evaluate their relative sustainability. In order to achieve these two aims we have developed five case studies of Italian industrial districts. Industrial districts, as we explained in the first chapter, are geographically collocated communities of individuals and firms sharing a

common industrial specialization. The local creation of trust, as we shall see, is based on socialization between community-members. The result of this process is personal reputation. The value of this reputation, however, is embedded within the local network of social relationships between members of the industrial district. Therefore, the question is how the local base of trust, which is embedded in the local system, is translated into codes, which are appropriable in the global system, and, *vice versa*, how these codes are translated into norms and values that are locally appropriable.

This second part of the thesis is structured in four chapters. The next chapter analyses the process of trust creation within Italian industrial districts. It is structured in two parts. The first part provides a brief review of the literature on industrial districts and local production systems. We show that trust is an enabling factor for the development of industrial districts. The second part of this chapter is devoted to the analysis of the process of trust creation within industrial districts. We show that trust is rooted on a set of cooperative norms and values, which are historically inherited within a community. The reproduction of trust within industrial districts is based on competition. The structure of the local market, in fact, stimulates personal investments in reputation and mutual trust. We conclude by arguing that the value of local reputation is attached to the collective experience of interaction within the district. Therefore, it is not exportable outside the local system.

In the following three chapters we address the case studies. Each chapter refers to a specific model of trust creation between local and global systems. Chapter 6 addresses the de-coupling model of trust creation. This model, as we shall see, is based on the complete separation between local and global processes of trust creation. The creation of trust between local and global systems is entrusted to a small number of large companies. Chapter 7 refers to the coupling model. This model is based on the local adoption of global standards of trust. The common community membership, therefore, no longer sustains the mutual identification and cooperation between members. Each member of these communities competes on their own within a global system. Chapter 8 refers to the loosely coupling model. This model is based on the loose integration between local and global creations of trust. The translation of trust between local and global is entrusted to a large number of small- and medium-sized firms, which compete on their capacity to sustain the

interaction and the mutual accessibility between the local and the global systems. This model is based on the local adoption of global standards of trust. However, the adoption of these standards is interpreted as an opportunity to consolidate existing relationships of mutual trust between local firms. Table 4.1 provides a map of the case studies discussed in each of the chapter.

Chapter	Model	Case studies
Chapter 6	De-coupling	Benetton system The eyewear district
Chapter 7	Coupling	Fiat
Chapter 8	Loosely coupling	The district of packaging The footwear district of Riviera del Brenta.

Tab. 4.1 Map of the case studies chapters

5 THE LOCAL CREATION OF TRUST

In our model of trust creation between local and global systems we distinguish between two processes of trust creation: local and global. The objective of this chapter is to analyze the local process of trust creation in industrial districts. This chapter is structured in two parts. The first part reviews the literature on industrial districts and local production systems. We show that trust is an enabling factor in the development of industrial districts. The second part is devoted to the analysis of how trust is created and reproduced within local production systems. We show that trust is rooted on a set of cooperative norms and values, which are historically inherited. However, the socialization and internalization of trust within local systems is based on competition. The specific structure of the local market, in fact, stimulates its members to invest in mutual trust in order to gain reputation within the local system. The value of this reputation is attached to the collective experience of interaction in the local network. Therefore, it is not exportable outside local systems.

5.1 The concept of industrial districts

The term “industrial district” was coined by the English economist, Marshall (1920), in order to characterize geographical clusters of a large number of small- and medium-sized enterprises belonging to a common industry. These firms cooperate on a temporary basis to satisfy the requirements of specific clients. This model, according to Marshall, is an alternative to the accumulation of knowledge and capital under a small

number of large and vertically integrated corporations. There are two conditions that enable the development of industrial districts. The first is the possibility of technically decomposing the production process into activities that can be performed autonomously in small-scale production plants. The second is a peculiar atmosphere of mutual trust between the members of an industrial district. The prevalence of mutual trust between them is necessary in order to reduce the costs of integration and cooperation between independent local firms.

The work of Piore and Sabel (1984) focuses mainly on the technical dimension of an industrial district. They explain that the renewed competitiveness of flexible forms of production based on networking between firms, such as an industrial district, is mainly a consequence of the development of flexible forms of automation. The development of these machines, in fact, allows for the opportunity to technically decompose the production process into a number of autonomous activities, which can be carried out within small-scale firms or teams. Furthermore, the development of information and communication technologies reduces the costs of coordination and control between firms or teams (see also Ciborra, 1993).

The recent literature, however, has mainly focused on the social dimension of industrial districts. We can distinguish between three major schools of thought (Bramanti and Maggioni, 1997). The first school, known as *milieu innovateur*, focuses on how the structure of the social context, defined as a network of relationships between firms and individuals, influences the individual and collective innovative capacity of firms (Camagni, 1991). This perspective is proposed by the GERMI group (Groupe de Recherche Europeen sur les Milieux Innovateurs). It is based on the concept of *milieu*. A *milieu* is a system of territorial relationships between different social actors forming both a complete production system and a community of individuals. The strong interdependence between market and community enables the development of a market where not only prices and quantities are exchanged, but also information, codes, languages and routines (best practices).

The second perspective, which we can call the Italian school, is mainly based on the theory of knowledge creation (Nonaka and Takeuchi, 1995). The local system is defined as a local cognitive network between firms, which share specific languages, norms

and values (Becattini and Rullani, 1993; Rullani, 1997; Albertini, Pilotti, 1996). The efficiency and effectiveness of being locally embedded is associated with the reduction in costs of socializing and internalizing experiences. The competitiveness of local systems is tied with the capacity of balancing local experiences and global accessibility. The competitiveness of the local system depends on the presence of a large number of integrators or meta-organizers, which are able, on the one hand, to transform their experiences in the local system into products, services and codes that are appropriable in the global market and, on the other hand, to transform codified knowledge, which is useful for the development of the local system, into local experiences and practices (Becattini and Rullani, 1993; Albertini and Pilotti, 1996).

The third perspective, known as the Californian school, is based on the theory of transaction costs. The efficiency and effectiveness of local production systems depends on the existence of “un-traded independences”. These are resources genetically tied to a specific location, such as the labor market and historically consolidated routines of coordination and cooperation between firms. These interdependencies can not be exported and traded. The accessibility to these resources, therefore, depends on being embedded within a specific social and cultural context.

These three perspectives, despite their differences, have many common aspects. The first commonality is that they all recognize the strategic relevance of the local dimension. The spatial proximity between individuals and firms facilitates the socialization of experience and the development of common practices and routines between firms. The value of these routines is not completely transferable because it is strongly tied to the specific cultural and social experiences shared between parties.

The second aspect is that they share a common conceptualization of space as a network of social and personal relationships between individuals and firms. The possibility of sharing experiences, routines and practices is not primarily dependent on the physical proximity between parties, but mainly on their social and cultural proximity. Physical proximity, however, may facilitate the development of mutual knowledge and relationships between individuals and firms.

The third aspect is that all three perspectives recognize the role of spatial proximity, local public institutions and associations made between companies in sustaining

the cooperation between local firms. The role of these institutions and associations is to provide common services and to sustain the development of common policies between companies.

Finally, these three perspectives agree on the idea that the sustainable development of local production systems is tied to the interdependence and interaction between local and global dimensions. Grabher (1992) argues that too little embeddedness may expose the local production system to the erosion of the supportive network of relationships between firms. Too much embeddedness, however, may promote the petrification of this network and, hence, hinder its capacity to produce and adopt radical innovations.

5.2 The foundation of trust within industrial districts

In the previous section we argued that a peculiar atmosphere of mutual trust between the members of an industrial district is a fundamental factor characterizing this specific model of production. The question, however, is how trust is created and renovated within industrial districts. There are two major factors that contribute to sustaining the creation of trust within an industrial district: culture and reputation. The objective of this section is to investigate the cultural dimension of trust within Italian industrial districts.

Italian districts are not homogeneously distributed over Italian territory. They are mainly clustered in the North East and Central parts of Italy, which is commonly known as Third Italy. This region of Italy, according to the sociologist Putnam (1993a; Putnam et.al. 1993; Fukuyama, 1995), is endowed with a high level of social capital. Putnam argues that the origin of social capital in this region can be traced back to the tradition of civic community in the Middle Ages. In fact, most of the cities located in Third Italy developed an innovative model of governance, as an alternative to the feudalistic one, based on voluntary associations between citizens. These associations had a different scope, such as neighbors' associations and craftsmen and tradesmen guilds and so forth, but a common purpose: protecting common interests and sustaining mutual cooperation between members.

Putnam, in order to support his argument, shows that most striking institutional innovations of the Middle Ages, which required an abundant level of mutual trust between

citizens, originated in Third Italy. The first example is the institution of credit. The etymology of the term credit is *credere*, which in Italian means to believe. Another example is the institution of contracting. The introduction of these innovations has enabled these communities to extend their commerce far beyond their geographical boundaries. For example, the Venetian Republic was mainly an economic and not a territorial empire. For instance, the Venetian merchant, Marco Polo, traveled to China and in so doing opened up the “silk route”. As a result of developing commerce, the welfare of these communities increased and, consequently, the basis for mutual trust was consolidated.

Associations still play an important role in sustaining the development of trust within industrial districts. In the textile district of Prato, for instance, artisan and industrial associations, together with the local municipality, negotiate a fair price for subcontracting. This agreement does not have any legal value. However, the names of companies found in violation of the agreement are made public. The function of this agreement is not to regulate the local market, but to shift local competition from price to quality. Furthermore, local associations and public institutions directly support the formation of consortia between firms to stimulate the diffusion of innovations, quality and the accessibility to financial resources.

5.3 The socialization and internalization of trust within industrial districts

In the previous section we investigated the cultural dimension of trust in industrial districts. The argument of culture, however, is not sufficient to explain cooperation between firms within industrial districts. Culture provides only generic information about the potential behavior of a counterpart within a district. In the case of complex and specific transactions knowing that the counterpart is, on average, reliable is not sufficient alone. Specific knowledge about his or her competencies and attitudes is required in order to make sure that the transactions will be completed successfully. The objective of this section, therefore, is to investigate how trust is established and developed within industrial districts.

The socialization of trust within districts is the product of competition between members. This competition takes place within a closed context, where members know each other. Members, from this perspective, are stimulated to invest in mutual trust in order to

gain reputation in the community. Furthermore, the cost of behaving opportunistically within the community is not limited to a single relationship, but spans along the local network (Dei Ottanti, 1995; 1996).

In industrial districts there are two major strategies that are usually applied to stimulate individuals' investment in reputation. The first is the strategy of dual sourcing. In a district we can distinguish between two major categories of firms: commercial and manufacturing. The first specializes in the marketing of the product. The second specializes in the different phases of the supply chain. Therefore, the first contracts out a large part of its production to local networks of specialized firms. Commercial firms have two categories of subcontractors: long-term and short-term. Long-term subcontractors have a long history of cooperation with the firm. Short-term subcontractors are used to absorb potential peaks of demand or low quality productions. This strategy of contracting has two major advantages. The first is the possibility of comparing the performance of each supplier in the network. The second is to stimulate competition between alternative sources of supply. The suppliers belonging to the first category are stimulated to invest in reputation in order to maintain their privileged status. The suppliers belonging to the second category, on the other hand, are stimulated to invest in reputation in order to improve their status. The capacity of commercial firms to attract local suppliers, on the other hand, depends on their capacity to market the final product and, therefore, on their reputation in the global market. It follows that each member of the district is stimulated to invest in reputation in order to maintain or acquire status in the local system.

The second is the strategic management of financial credit. These two strategies are strongly inter-linked. Gaining access to lines of credit is one of the main problems for most of the firms in the district because they are mainly of small- and medium-scale. In order to solve this problem industrial districts have developed a complex financial system, based on the development of chains of credit. These chains of credit function as follows. The local banks open lines of credit to local commercial firms. These lines of credit exceed the needs of these firms. Therefore, local commercial firms finance their leading suppliers with this excess. There are two major reasons for this. The first is to buy the loyalty of their suppliers and subcontractors. The second is to acquire better information about the quality of their investments. The suppliers, on the other hand, are stimulated to reciprocate

trust and invest in reputation in order to ensure themselves of the future accessibility to lines of credits.

Local banks, on the other hand, have two major reasons for according excessive credit to local commercial firms. The first is that commercial firms strongly depend on local banks for finance and for the ensuring of their activities of import/export. Therefore, they are required to reciprocate trust in order to have access to future lines of credit. The second is that commercial companies have better knowledge in order to evaluate the quality of the investments made by their partners. Therefore, the risks and the costs of directly financing those small companies are much higher than entrusting the local commercial companies with excess credit.

However, the value of firms' reputations is embedded within their network of interaction. Therefore, it can not be transferred outside the industrial district. There are many ways to make reputation accessible, such as developing a brand, offering a guarantee or insuring the quality of performance or products. Establishing a brand, for instance, enables the transferability and socialization of clients' experiences. Brands, in fact, are categories that enable customers to organize and share experiences about the quality of a specific product. Offering a guarantee on the quality of a product enables the seller to take full responsibility of the quality of the product itself and this shows good faith and goodwill to counterparts. Providing a certificate that qualifies the quality of a specific product is another way of making trust accessible. However, these reputation mechanisms are costly. Therefore, most of the firms in an industrial district do not have the financial resources to bear such huge investments.

5.4 Conclusion

In this chapter we focus on the local process of trust creation within Italian industrial districts. We show that the process of trust creation within these systems is rooted within a common culture of mutual trust. The origin of this culture can be traced back to the tradition of civic communities, which characterized the North and Central part of Italy in the Middle Ages. The argument of culture, however, is not sufficient to explain the process of trust creation within these systems. In order to explain it we need to take into account also the social interaction that takes place between community-members.

From this perspective, we show that trust is the product of fair competition between members. The peculiar structure of industrial districts, in fact, stimulates its members to invest on and reciprocate trust to gain reputation within the community. The value of this reputation, however, is embedded within the local network and it can not be exported outside of it. The next three chapters, therefore, explore three alternative strategies of externalization and internalization of trust between local and global systems.

6 THE DE-COUPLING MODEL OF TRUST CREATION

In the previous chapter we investigate the local process of trust creation within Italian industrial districts. We show that the trust produced within these systems is not directly exportable to parties located outside of these systems. In this chapter we address a first model of trust creation between local and global systems. We name this model *de-coupling*. The use of the term de-coupling emphasizes the separation between local and global processes of trust creation (see Fig. 6.1). The connectivity between these two dimensions of trust creation is governed by a limited number of large companies. These companies hold a quasi-monopolistic position on the accessibility to the local system. The major limit of this model, as we shall see, is that local firms develop a sort of dependence on these connectors in order to get access to the global system.

To characterize this model we use two case studies. The first is the case of the Benetton system. Benetton is one of the leading companies in the clothing and sportswear industries. Its annual turnover, in the year 2000, was two thousand million Euro. Benetton, as we shall see, is the strategic core of a “glocal” network of firms. The local dimension is composed of more than four hundreds small and medium textile laboratories, which produce about 80% of Benetton’s annual production. The global one is characterized by almost 7000 franchises distributed in 120 countries.

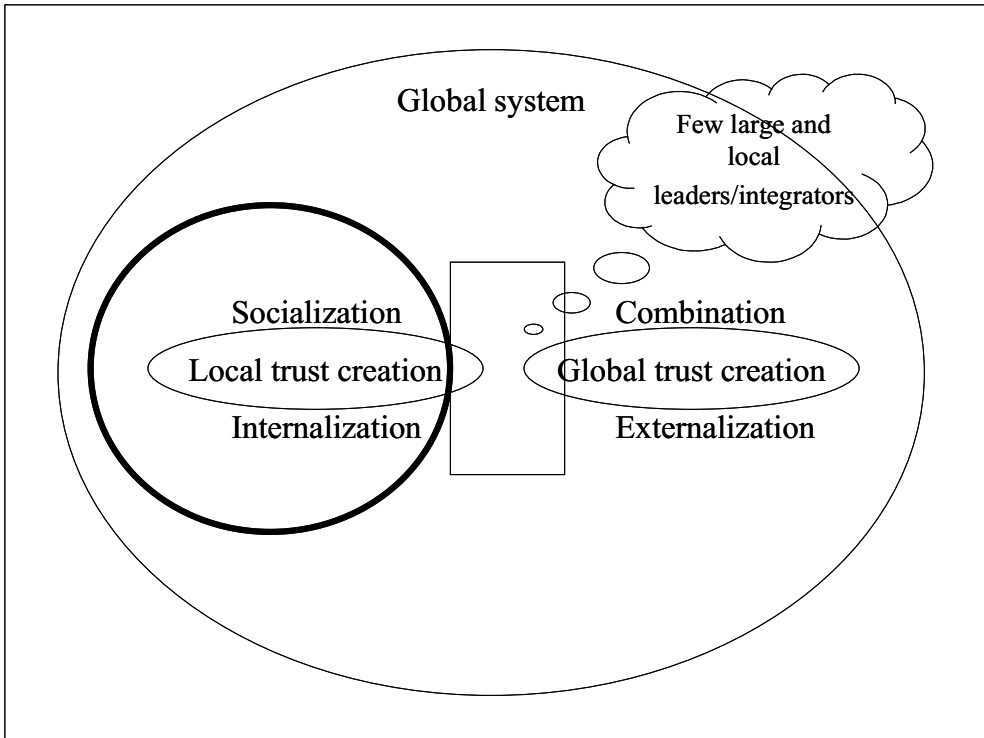


Fig. 6.1: The de-coupling model of trust creation

The second case study refers to the eyewear district of Cadore. This district, as we shall see, is dominated by four leaders, which are leaders also in the global market. The business model of these four leaders is similar to the one of Benetton. The major difference, however, is that they have vertically integrated large part of the production process. Local small and medium sized firms, as a consequence of this decision, are confronted with the major problem of developing new trusted relationships within the global system.

The structure of this chapter is the following. We first address the case of Benetton. The case of Benetton is structured in three parts. The first part provides a little of background. The second part analyzes the structure of the global network. The third part, analyzes the structure of the local one. The structure of the second case study is similar. However, we distinguish between the business model adopted by the leaders and the one adopted by the others local companies. We make this distinction in order to emphasize the

reasons behind the failing of local small- and medium-sized enterprises to develop new relationships with the outside.

6.1 The case of Benetton²⁷

The company is located in the province of Treviso, 20 km north of Venice. It was founded in 1955 as a small textile laboratory. It should be noted that the area was already characterized by the presence of a large number of small textile laboratories, which worked as subcontractors for large textile companies. These laboratories were mainly managed by women, as a complementary source of income. The area, in fact, was mainly agricultural.

The initial success of Benetton was mainly based on two major factors: the design of colorful jumpers and the development of a global franchising network of retailers. In the sixties men used to dress in black and white. The first innovation of Benetton was to design colorful jumpers, which quickly became one of the distinctive symbols of the sixties. The second innovation was to develop a franchising network of retailers. It is interesting to note that Benetton did not have in mind the development of such a network. It was only by chance that the first Benetton shop was founded in Belluno, which is a small city 100 km north of Venice in the Alps. The success of this shop convinced Benetton of the advantages of this mode of selling. Nowadays, Benetton consists of more than 7000 stores, in the form of franchises, all over the world.

6.1.1 The global network

The global distribution network of Benetton is structured into two levels. The first level is the one of agents. These are in the number of 90 distributed all over the world. They work exclusivity for Benetton and control a specific geographical area. The major function of these agents is to mediate the relation between Benetton and the franchisees. Agents play two major functions. The first is to show new collections and collect orders. The second is to stimulate the development of the franchising network in their geographical market. They are shareholders in most of the stores in their areas. There are

²⁷ This case study is based on Ganzaroli (1994). The original contribution has been integrated with two interviews with the responsible of the IS department and one of the managers of the human resources department. For the historical part we referred to the bibliography of the Benetton family (Mantle, 1999).

two aspects that should be noted. The first is that most of the owners of these agencies are either long-term friends of the Benetton family or ex-employees of the commercial and marketing departments, who have been awarded with the opportunity of opening an agency. The second aspect is that product orders are directly between Benetton and its franchisees. Therefore, the agents do not have any direct responsibility on the insolvency of the two counterparts.

The second level is that of franchisees. These are almost 7000 distributed in 120 countries. The contract of franchising proposed by Benetton has some peculiarities. The first is that Benetton does not invest any money in opening new shops. The local entrepreneur bears all the costs of the initial investment. The opening of stores in strategic cities is an exception, such as the first Benetton shop in Moscow.

The second peculiarity is that the contract of franchising does not provide any guarantee on the exclusiveness within a specific area. Another entrepreneur can decide to open another Benetton shop just on the opposite side of the street to an existing one. These two factors have strongly contributed to the stunted growth of Benetton in the US market, which still only account for less than 5% of annual turnover.²⁸ However, it should also be noted that Benetton does not require the payment of any royalties on its brand.

The characteristics of the contract of franchising are relevant in understanding how Benetton produces trust between the local and global systems. If it is true that Benetton does not take any risk in the opening of a new store, then it is also true that its capacity for attracting new franchisees depends completely on its capacity to stimulate trust in, and knowledge of, the brand in the market. Local entrepreneurs, in fact, will open new stores if, and only if, they expect that it will be profitable. In other words, only if they believe there is a demand for Benetton clothes in their city. It should be noted, however, that recently the retailing strategy of Benetton has changed. The new retailing strategy is based on mega stores, which are directly controlled by Benetton (Camuffo et.al. 2002).

²⁸ It should be noted that the low market penetration of Benetton in USA is also consequence of the advertising strategy implemented by the firm in the last two decades. This was based on a number of shocking images, such as the one of the blood of a young man killed in the Balkans. This kind of images has been considered really offensive in USA.

6.1.2 The local network

The local network of Benetton's subcontractors counts almost four hundred small and medium laboratories, which produce 80% of Benetton's annual production. These laboratories specialize in different phases of the production process. They work exclusively for Benetton. Until recently, there was not any written contract binding Benetton to its local subcontracts. Business was made on the promise of a handshake. This practice has changed recently as a consequence of the introduction of the national law on subcontracting. This is a legal framework imposed by the national government in order to regulate the process of subcontracting. The Benetton system, which also comprises its subcontractors, adopted this contract in order to comply with the law. However, there was no need for such a contract.

It should be noted, however, that Benetton subcontracts only the phases of the production process that are not strategic. For instance, the design of the product, which is one of the most strategic phases of the value chain, is performed internally. The procurement of raw materials, production planning, cutting of clothes, packaging and distribution of the final products are all activities that are performed internally. Therefore, it is Benetton that guarantees the quality of the products produced in the local system. The local system is only a means of reducing production costs and increasing flexibility.

6.1.3 The role of information and communication technologies

Information and communication technologies do not play any relevant role in sustaining the creation of trust between local and global systems. These technologies are mainly used to improve the capacity of Benetton to collect and process information from the market. The two main software applications are the order entry system, which is used by local agents to enter the order, and the bar code application, which enables the firm to collect information about daily selling trends. The access to these applications is based on an Extranet. Benetton maintains a standard EDI-relationship with the suppliers of raw material and logistic services. The development of digital networks to support coordination and cooperation between Benetton and its subcontractors has only been recently implemented in order to de-localize labor intensive activities into developing countries. In

the traditional production site the communication between Benetton and its subcontractors takes place mainly face-to-face, via telephone or fax and through the exchange of floppy disks.

6.1.4 Discussion

Benetton is the typical example of a de-coupling model of trust creation between local and global systems. Local and global are two separated dimensions of trust creation. There are not direct contacts between local and global players. The creation of trust between the local and the global system is entrusted to Benetton. The strategy of de-localization that Benetton has recently activated raises some questions about the reproducibility and sustainability of the local system. The model of de-localization developed by Benetton is based on the development of local production subsidiaries, which are in charge of coordinating and controlling the activities of local networks of subcontractors. It should be noted that these new production sites have already been digitally integrated. However, the standard of communication is not public, but proprietary. Therefore, it is not accessible to other parties.

6.2 The eyewear district of Cadore²⁹

The eyewear district is located in the valleys of Cadore, which is an area of the Alpine Dolomites 100 km north of Venice in the province of Belluno. Its origin can be traced back to the golden age of the Venetian Republic, when lenses were produced in Murano, which is still famous worldwide for glass production, and frames were produced in Cadore. Its real origin, however, can be traced back to 1878, when two local entrepreneurs founded the first Italian optical firm. A number of other firms resulted from this first firm. In the 1930s the number of optical firms already numbered 7, in 1951 81, and in 1991, the date of the last census, 733, most of them being of small- and medium-size (Albertini and Pilotti, 1996). Currently, the district counts 1.500 enterprises, which

²⁹ This case study is based on Ganzaroli and Pilotti (1996), Albertini and Pilotti (1996) and Anfao (2001) and the European project proposal "Cittadella dell'Occhiale". These contributions have been integrated on the basis of twenty interviews to local entrepreneurs and public officers.

produce 25% of the global production of frames and 50% of the one of high quality (Camuffo, 2001).

There have been many factors that have contributed to sustaining the development of this district: the relative isolation of the area, the insufficiency of the local agriculture to sustain the community, the small dimensions of the production plans, the availability of energy, the high rate of unemployment, the entrepreneurial character of people from the mountains and so forth (Albertini and Pilotti, 1996). The district, until 1960, was characterized by the prevalence of firms of small and medium dimensions, which worked as subcontractors for large industrial companies and wholesalers located outside the district.

It was from 1960s that the morphology of the district started to change. This period was characterized by an important change. Eyewear changed its connotation from being a therapeutic to a fashion product. This change provoked a shock. It was no longer sufficient to know how to produce frames, but it was also necessary to know how to market the product. In other words, it was necessary to open up the district and to develop efficient systems of intermediation between local and global. Only a few companies understood the consequences of this change at the time. Therefore, these companies have been able to fully exploit the opportunities created by this change. The others did not.

The current structure of the district can be characterized as following. The district is dominated by four leaders (Luxottica, Safilo, Marcolin and De Rigo), which are also leaders of the global market. It should be noted, however, that the dimension of these four leaders is very different. The annual turnover of Luxottica (2.300 million Euro) is four times the one of Safilo (550 million Euro) and De Rigo (400 million Euro), and twenty times the one of Marcolin (around 100 million Euro) (Camuffo, 2001). These leaders are “surrounded” by a large number of small and medium sized producers. These produces are structured according to the traditional business model of the district. On the one hand, they contract out large part of their production to local network of small and medium enterprises, which specialize on specific phases of the production process. On the other hand, they produce mainly for external dealers and wholesalers.

6.2.1 The business model of the leader

The four leaders have adopted a common business model. The first adopter, from this perspective, has been Luxottica. Two major aspects characterize this model: the vertical integration of the supply chain; and the purchasing of royalties from leading designers of the fashion system. The process of vertical integration started in Luxottica from the beginning of the eighties. In a decade the percentage of the production contracted out decreased from 70-80% to 10%. In the nineties this percentage decreased to 1%.

There are two major factors behind this development: the development of flexible and computerized machines and the necessity to improve and certify quality (Camuffo, 2001). The development of flexible machines enabled the four leaders to achieve high levels of efficiency, productivity and flexibility without the need to rely on external production capacity. On the other hand, the traditional model, based on the distribution of the production process among a large number of small and medium firms, did not guarantee the possibility to achieve the level of quality and time-to-market required to be competitive in the global market.

In the same period the four leaders started to expand their control over the distribution chain. This process took place in two phases. In the first phase, the four leaders invested on the development of their own private and global network of subsidiaries. In a second phase, which started only recently, these four leaders have started to expand their control over retail chains. Luxottica, for instance, took over LensesCrafters, which is the largest retail chain in USA, and Sun Glass Hut, which is one of the largest in Europe, and it becomes also the largest glass retailer in the world.

The second aspect that characterizes the model of the four leaders is the payment of royalties to leading designers of the fashion industry. The four leaders spend, on average, 7% of their annual turnover in royalties. Luxottica is an exception because it pays only 1.7% of its annual turnover. It should be noted, however, that the frame design is made by the producer and not by these designers. Therefore, Valentino, Calvin Klein and so forth only sell their reputation and not their design. The acquisition of the brand is a strategic move for these companies. The mark-up that the producer can apply to a frame depends mainly on the brand. Producing a frame of high quality costs around 15 €. The

same frame is sold to the final consumer for 150 €, if it is branded (see also Camuffo, 2001).

6.2.2 The disruption of trust within the district

The decision of the four leaders to vertically integrate the production process had a major impact on the district. Local firms, as consequence of this decision, lost their protection barrier against market fluctuations and global competitiveness. The four leaders, in fact, do not absorb anymore the largest part of the production capacity available in the district. The growth of the district in the second part of the nineties has been of the 5%. However, this is mainly explained by the increase of the four leaders. In the same period the number of firms in the district has decreased of the 25% and the number of employees has increased of 14%. However, the four leaders have mainly employed these employees (Camuffo, 2001).

There are two main reasons behind this crisis. The first is structural, which is the competition of Far East countries and mainly China. Chinese companies are ever more competitive also in the high segments of the eyewear market. There are companies of the fashion system that have started to contract out their production to Chinese companies. Furthermore, the largest retail chains in USA have contracts out 80% of their demand for glasses to Chinese companies. Finally, many small and medium producers located in Cadore have started to de-localize part of their production in China (Camuffo, 2001).

The second factor is endogenous. Local firms are incapable to establish any form of cooperation to joint their effort to improve their capacity to compete in the global market. It should be highlighted, from this perspective, that local public institutions have lunched many initiatives to sustain collaboration between local entrepreneurs.

In 1995, the local industrial associations, together with a local bank, tried to sponsor the development of a common EDI infrastructure to virtually integrate local and global firms. The project failed because of the lack of consensus. Last year, the local Chamber of Commerce, together with most of the local associations and municipalities of the area, launched a European project, which is called the “Eyewear Village” (La cittadella dell’occhiale). In this project there are two important sub-projects. The aim of the first is the development of a common brand that guarantees the quality of frames produced in

Cadore. The aim of the second is the development of an electronic procurement system to improve accessibility to the local system. Both these projects have encountered some difficulties in taking off. In the case of the quality brand, for instance, there is a conflict between two groups of firms. The first group supports the idea that the brand should guarantee the quality of the product. The second group, on the other hand, supports the idea that the brand should only guarantee the origin of the product.

There are two major reasons behind these failures. The first is the individualistic and egoistic character of local entrepreneurs. Local entrepreneurs prefer to die alone rather than to lose their independence and freedom. The second reason is that local public institutions are not able to substitute the four leaders. In the past the four leaders stimulated cooperation within the local system. The local public institutions seem to not have enough power and tools to play the same function.

6.2.3 Discussion

We decided to include the case of Cadore for one main reason. It shows the negative consequences that a de-coupling model of trust creation may produce. This case, in fact, has many points in common with the one of Benetton. In both cases there is a leader or a group of leaders, which function as strategic connectors between local and global systems. In both cases their role is based on two major factors: the progressive expansion of their control over retail chains and large investments on brand recognition.

There is, however, a major difference between these two cases. Benetton did not vertically integrate the entire production chain, but only the most strategic phases. The four leaders in the eyewear district, differently, have vertically integrated the entire production process. The consequences of this decision have been dramatic for the district. Local firms, in fact, are not capable to develop alternative connections with the outside market. There are two reasons that explain the different strategy implemented by the leaders in the two cases. The first is that the level automation that can be achieved in the two production processes, which is higher in the case of the production of glasses. The second reason, however, is that the four leaders in the eyewear district did not trust their local counterparts to be able to guarantee high quality products and time-to-market. The time to market, for instance, could be improved by adopting a common inter-organization information system

to improve the level of coordination and control within the local system. The four leaders, however, did not show any interest for the proposal of the local industrial associations to develop such an infrastructure.

The subcontractors of Benetton are currently running the same risk. Benetton, in fact, has launched a strategy of de-localization of labor-intensive activities in developing countries. The strategic orientation of Benetton, however, seems to be different. Benetton intends to contract out to local firms strategic phases of the production process, which are currently performed internally (Camuffo et.al., 2002). Therefore, Benetton intends to sustain the development of the local system by transferring part of its competences to the firms that are embedded within the local system.

6.3 Conclusion

In this chapter we analyzed a de-coupling model of trust creation between local and global systems. In order to develop this model we rely on two case studies: Benetton and the eyewear district of Cadore. In these cases we show that the creation of trust between local and global is entrusted to a small group of leading companies, which guarantee the quality of the connectivity between these two dimensions. Their role of guarantors for the trustworthiness of the glocal system is based on three major factors: their knowledge of the local system, their control over the distribution and retail chains, their investment in brand reputation. Furthermore, in the case of Cadore we showed the negative consequences that may derive from the adoption of the de-coupling model of trust creation. Local firms may remain locked in as consequence of their incapacity to create trust with potential partners located outside the local system.

7 THE COUPLING MODEL OF TRUST CREATION³⁰

In the previous chapter we addressed the de-coupling model of trust creation. This model is based on the strong separation between local and global mechanisms and institutions of trust creation. The objective of this chapter is to address an alternative model of trust creation, which we have named *coupling*. This model is based on the codification of trust along the entire value chain. In this model, as we shall see, the distinction between local and global does not make sense. Business relations are embedded within a global system of rules and codes. Our major argument in this chapter is that the adoption of these mechanisms erodes the specific identity of local systems, which do not sustain anymore the development of small and medium enterprises.

In order to characterize this model, we refer to the case of Fiat system. Fiat is the largest car manufacturer in Italy and one of the largest in Europe. Our starting point for this analysis is the transition from mass production, which is based on vertical integration, to lean production, which is based on horizontal cooperation. This transition in Fiat took place between the beginning of the seventies and the middle of the nineties.

³⁰ This case studies is based on Bonazzi (1993), Volpato (1996), Camuffo and Volpato (1998) and Ciborra and Patriotta (1999). It has been integrated with interviews with one of the manager of the Human Resources department and the responsible for e-commerce project in Fiat. Furthermore, we interviewed the technical responsible for the IS department of Fiat.

In order to define the concept of lean production we use the metaphor of the crystal pipe, which the Italian sociologist Bonazzi (1993) proposes at the end of his study about the adoption of lean production in Fiat. This metaphor, at least in our perspective, is extremely powerful to characterize the essence of lean production. The metaphor of the crystal pipe is used, in the second part of this chapter, to interpret the internal and external reorganization of Fiat according to the principle of lean production. The last part of this chapter is devoted to analysis the recent developments in the automotive industry. Our goal is to show that the transition toward global and codified systems of trust is in progress.

7.1 The crystal pipe

The transition from mass- to lean-production in the automotive industry took place in the last three decades. The model of lean production emerged in Japan starting from the sixties. The sociologist Bonazzi (1993) characterizes this model using the metaphor of the crystal pipe. He develops this metaphor in the last chapter of his book about lean production in Fiat. He argues that this is the way the management of Fiat perceives the lean model of production.

The metaphor of the crystal pipe is extremely powerful to represent the essence of lean production. The pipe evokes the sense of passing through. The lean model is a continuous flow, which arrives to its final destination just-in-time. Furthermore, the pipe evokes the sense of leanness/essence and flexibility. Lean production aims to achieve the maximum level of synchronization along the value chain through the intense and horizontal exchange of information. The pipe is circular. The circle is the symbol of perfection. The metaphor of the pipe, from this perspective, symbolizes members' commitment toward continuous quality improvements (total quality management).

The pipe, however, is made of crystal. The metaphor of crystal has a double meaning. On the one hand, the crystal is transparent. It symbolizes members' commitment to share information to improve cooperatively their performances. The crystal, on the other hand, is also fragile. The crystal, from this perspective, symbolizes the fragility of the lean model of production. The different phases along the production process are highly synchronized. Therefore, if there is some problem at any level of the value chain, the cost of this problem is going to span along the entire value chain. It follows that the

performance of each member of the value chain - be a firm, a group or an individual - is critical for the performance of the entire value chain. Therefore, the lean model of production critically depends on mutual trust and cooperation between all the members of the value chain.

7.2 The crystal pipe in Fiat

In the previous section we use the metaphor of the crystal pipe to define the concept of lean production. The objective of this section is to analyze how this metaphor has been interpreted and adopted in Fiat. Bonazzi argues that the crystal pipe is not constrained within firms' boundaries, but spans across industrial relations. Therefore, this section is structured in three major parts: lean production within Fiat, lean production between Fiat and its suppliers, lean production between Fiat and its customers.

7.2.1 Internal reorganization: lean production within Fiat

The adoption of the concept of lean production in Fiat took place in three major phases: rigid automation (1972-1978), flexible automation (1978-1988) and Japanization (after 1988).³¹ These three phases can be interpreted as part of a learning cycle (Bonazzi, 1993). The automation strategy, both rigid and flexible, had two major objectives. The first was to improve quality, flexibility and productivity by investing into the synchronization and automation of the production process. The second was to reduce the level of dependence on workers' consensus and participation. This second goal was mainly a consequence of the strong conflict between Fiat and the Labor Unions in the seventies.

The management of Fiat decided to fully convert to the principles of lean production as a consequence of the failure of the project Highly Automated Factory (HAF). This project aimed to fully automate the assembly line. Fiat had a long-term experience in automation. The project FIRE (Fully Integrated Robotized Engine), which aimed to automate the engine assembly line, has been a success. 85% of the operations along the engine assembly line were automated. The production costs were cut by 10%. The number of components was reduced by 30%. The lead-time was reduced by 50%

³¹ See Bonazzi (1993) and Volpato (1996).

(Camuffo and Volpato, 1998). The automation of the final assembly line, however, was much more complex. In fact, the number of operations and interdependence between operations were much higher than in the case of the engine assembly line.

The failure of the HAF project convinced the management of Fiat that human resources play a central role in the lean model of production. The flexibility that can be codified within a technological infrastructure is only limited. Human resources, from this perspective, can overcome these limitations by adding flexibility and creativity to the assembly line. The management of Fiat, therefore, shifted its focus from the concept of Highly Automated Factory to the one of Integrated Factory (IF). Ciborra and Patriotta (1999) describe IF as the attempt to combine apparently contradictory concepts: high automation and rigid synchronization with human touch, creativity and intuition; sophisticated and computerized control and coordination systems with socialization, team-working and face-to-face interaction.

The IF is structured into operative units, which are responsible for a specific process. In the case of Melfi, which is the first plant where the concept of integrated factory was adopted, the organizational units were four: plating, pressing, painting and assembly. Operative units cooperate to define daily production plans, monitoring production and managing critical situations. Each operative unit is structured into two functions: production, which is in charge of the production process, and engineering, which is in charge of maintaining the technological infrastructures and assisting the Elementary Technological Units. Elementary Technological Units (UTE) are the basic elements of IF. They are composed of 80-100 workers each distributed into three shifts. Each UTE is responsible for managing a homogenous technological sub-system and a specific segment of the production process. UTEs are evaluated in terms of quality, productivity and costs.

Coordination between UTEs is based on horizontal flow of information. These are structured as in customer-supplier relationships. This structure, therefore, tends to replicate internally the structure of the external organization. The IF, from this perspective, is a captive market, which is regulated in terms of quality and price. The costs of low quality performances are directly imputed to the budget of the UTE and indeed to its "profitability".

The adoption of the lean model of production has also implied the formation of quality-oriented groups. In Fiat there are four types of these groups. The first are the Omega groups, which focus on critical problems. These Omega groups are not quality groups in the Japanese sense. In Japan quality groups form spontaneously. The Omega groups, instead, are institutionalized. The second are the Torquato groups, which are created by the Omega groups to solve specific problems. The third and the fourth are respectively Cedac and suggestion systems. These are quality groups in the Japanese sense. They form spontaneously and on temporary-basis. The aim of these groups is to provide suggestions to solve specific quality problems. The suggestions proposed are evaluated by a commission, which grant a monetary award proportional to the value of the contributions/suggestions. The number of participants to these groups in Fiat is lower than in most of Japanese companies. However, it is high compared to European standards (Volpato, 1996).

The adoption of the concept of IF has stimulated the formation of a new culture. The relationship between management and workers is more cooperative than before. Bonazzi, however, argues that, like in many other cases in Europe, the basis of workers' consensus and participation is not dependent on job-enrichment, but on automation of risky activities. Furthermore, Ciborra and Patriotta (1999) show that the introduction of lean production has changed the practices and routines within the organization. Workers do not perceive the production process as a combination or a sequence of independent phases, but as an integrated assembling/disassembling system. This mental representation of the process facilitates cooperation between workers both within and across UTEs.

7.2.2 Supply chain reorganization

In the previous section we focus on the reorganization of the internal value chain according to the principles of lean production. However, the adoption of lean production requires expending the same philosophy also to the external value chain. This is required in order to achieve the maximum level of coordination and synchronization between all the parties involved into the value chain. This section focuses on the reorganization of the supply chain according to the principles of lean production. Next section, instead, will focus on the reorganization of the commercial chain.

In Fiat the reorganization of the supply chain took place in two major phases. In the first phase Fiat attempted to reduce its internal costs by externalizing part of the production to local network of suppliers. In the second phase, instead, Fiat introduced the concepts of partnership and cooperation with suppliers and, therefore, stimulated suppliers' participation.

In the first phase the supply chain was restructured into three levels: captive, prime contracting and subcontracting. Producers of components, previously belonging to the Fiat group, formed the captive level. There were three producers, each of whom were entrusted with coordinating the activities of prime contractors within a specific market of supply: electronics, plastics and metallurgic. The prime contractors were entrusted with coordinating the activities of subcontractors within their specific phase of the supply chain, such as the supply of transmission systems. Fiat selected the prime contractors on the basis of a competition between subcontractors in order to be able to compare their quality and trustworthiness. The reorganization of the supply chain also meant the transition from short-term contacts to long-term partnerships. In the period between 1980 and 1989 the number of long-term contracts increased from zero to 1,750 with a total value of about 50 billion Euros.

In the second phase Fiat entered into the logic of partnership. The number of prime contractors has been further reduced. The new logic of partnership is based on a program of "guided growth". This is a program of apprenticeship for prime contractors. During this program, prime contractors are initiated in the art of total quality management and co-designing. Fiat plays the role of the consultant for the management of quality. The scope of this program is to develop a base of suppliers ISO-certified for their quality and trustworthiness (Volpato, 1996; Camuffo and Volpato, 1998).

Having a certified network of suppliers has two major advantages. The first is that each supplier certifies itself for its quality and, therefore, it is legally responsible for it. Let us suppose that a driver crashes his or her car because the brakes fail. The blame no longer lies with Fiat, but with the brake system's supplier. The second advantage is that Fiat does not need to perform any quality control. This activity is entrusted to suppliers.

The efficiency of this system of certification depends on the possibility of keeping track of the flow of materials. Information and communication technologies, from this

perspective, play a major role. Each car component, in fact, is identified by a bar code, which univocally identifies its supplier.

Furthermore, the adoption of EDI has improved the flexibility of the supply chain. The idea behind “just in time”, which is one of the innovations that characterize the lean model of production, is that cars are produced only when they have already been sold. Therefore, in order to reduce the lead-time between order and delivery of cars it is necessary to maximize the coordination between firms in the value chain. The use of EDI, from this perspective, has reduced the time needed to share information and coordinate activities.³²

Tables 7.1 and 7.2 are useful in understanding the impact of the reorganization of the supply chain. The first table shows the relative distribution in percentage terms of the components produced internally, those bought from suppliers of the group (captive-buying) and those bought from partners (non-captive buying). In the period between 1987 and 1997, the percentage of the value of components produced internally decreased from 38% to 30%. This value was redistributed between captive (+ 3%) and non-captive (+ %5) suppliers. The second table has even more relevance to the argument. It shows how the activities of designing new products were distributed between Fiat and its suppliers. In 1991, 76% of a new product was designed internally. In 1997, this percentage had fallen to only 30%. Therefore, suppliers have changed from being simple subcontractors of production capacity to real partners of Fiat directly involved in the strategic decisions of the company.

	1987	1992	1997
Make	38%	35%	30%
Buy Captive	14%	18%	17%
Buy non-captive	48%	47%	53%
Total	100%	100%	100%

Tab. 7.1. The distribution of production between make or buy (Adapted from Volpato, 1996)

³² It should be note that car manufacturers have been among the first, in 1984, to join together in order to develop a common EDI standardization committee (Odette). Now Odette has migrated in EDIFACT, which is the standard sponsor by the United Nations. Odette, however, is still active in the standardization of the logistic process: bar code, pallets and so forth.

	1991	1992	1993	1994	1995	1997
Internal design	76%	70%	60%	50%	40%	30%
External design	24%	30%	40%	50%	60%	70%

Tab. 7.2. The distribution of the design process between internal and external (Adapted from Volpato, 1996)

7.2.3 The reorganization of the commercial chain

The relation of dealership, in this case of Fiat, was based on an archaic contract. The dealer was simply an intermediary between Fiat and the final customer. The commercial transaction took place directly between Fiat and the customer and not between Fiat and its dealers. This type of contract was diffused when the automotive industry was still in its infancy and there was the need to stimulate the diffusion of dealers. Therefore, the historical conditions behind this type of contract were overcome. This type of contract had the negative effect of inhibiting the entrepreneurship and, indeed, the competitiveness of the dealers (Volpato, 1996). The reorganization of the commercial chain took place also in two phases.

The strategy of dealership, in the first phase, aimed to achieve two major purposes. The first was to transform the dealer from being a simple intermediary to being a franchisee. The second was to improve the competitiveness of its dealers by stimulating competition between them. The project was a failure. The intra-brand competition had two major effects: a proliferation of the number of dealers and a proliferation of free-riding. The majority of new dealers entered the market only for a short period and applied an aggressive price policy. The result was a fall in the quality of the service provided.

In the second phase, therefore, Fiat drastically reduced the number of dealerships and introduced a number of criteria, both technical and financial, that a dealer should satisfy in order to become a Fiat dealer. In this second phase, information and communication technologies have also played a strategic role in the reorganization of the retail chain. We highlight two major applications: Sirio and Focus. Sirio is an integrated ordering system, which is integrated with the internal “just-in-time system”. Through Sirio it is not only possible to verify the status of the order, but also to customize the product, even if its production has already started. The introduction of Sirio has reduced the lead-

time from 45 to 15 days. Focus, instead, enables car dealers to share and exchange orders, thus enabling them to rely on a shared and virtual car warehouse.

7.3 Toward a global supply chain?

The development of information and communication technologies and common quality standards has had a major impact on the structure of the automotive industry. The automotive industry has been traditionally strongly geographically clustered. Car manufacturers have tried to avoid sharing suppliers. The motivation was that suppliers had to be involved in the development of new models many years in advance. Therefore, there was a high risk of information leaks. In the 1990s, car manufacturers bought less than 20% of their components from outside their country of origin (Volpato, 1996).

The development of common standards of quality and communication, however, is gradually changing this practice. The introduction of EDI, for instance, has facilitated the possibility of sharing suppliers and subcontractors between car manufacturers. Many suppliers of German car manufacturers, for instance, are located in Italy and also work for Fiat. Furthermore, the introduction of common standards of quality has drastically reduced the cost of assessing the relative quality and trustworthiness of a specific supplier. It is no longer necessary to develop a long-term relationship in order to know the level of quality and trustworthiness of the counterpart. The counterpart is directly responsible for its quality and trustworthiness. Therefore, it is in its own interest to behave correctly and trustworthily.

The development of the Internet has opened up a completely new range of opportunities. It is possible, for instance, to drastically reduce switching costs. From this perspective, the main car manufacturers have recently signed a joint venture together with Commerce One, as a technical partner, to develop a global electronic market for the supply of components. The access to this market will be regulated. Therefore, only suppliers that conform to the standards negotiated between the car manufacturers can enter the market. However, the question is whether or not this solution is sustainable. In this perspective, Japanese manufacturers have shown some concerns. The development of an electronic market is incompatible with the development of long-term partnerships. Therefore,

suppliers will not be stimulated to invest in quality and reputation in order to reciprocate trust and further stimulate transactions (Volpato, 1996).

The automotive industry, as consequence of the development of open and global digital infrastructure, seems to move toward the concept of global supply chain and global communities (see fig.7.1). This community is organized as following. On one side, there are the major car manufacturers. These car manufacturers cooperate on the definition of common and codified standards of trust. On the other side, there are the suppliers of components. The development of common standard enable car manufacturers, on the one hand, to share information about quality and trustworthiness of their suppliers and, on the other hand, to dynamically integrate these suppliers into temporary supply chain.

7.4 Conclusion

In this chapter we have analyzed the case of Fiat as an example of coupling model of trust creation. We argued that this model of trust creation is based on the codification and standardization of trust along the value chain. Fiat, from this perspective, has strongly invested on the automation of the internal and external value chain. Furthermore, internal and external relations are organized according to a common logic, which is the one of customer-supplier relation. The development of open and global digital infrastructures seems to drive the transition toward the formation of a global supply chain, which is shared between car manufacturers. From this perspective car manufacturers are working on the definition of common standard procedures to coordinate and control suppliers. We argue that this will lead to the formation of a global community of suppliers. Car manufacturers will regulate the accessibility to this community according to common standard of trust and trustworthiness. In this context, therefore, it becomes difficult to distinguish what is local from what is global.

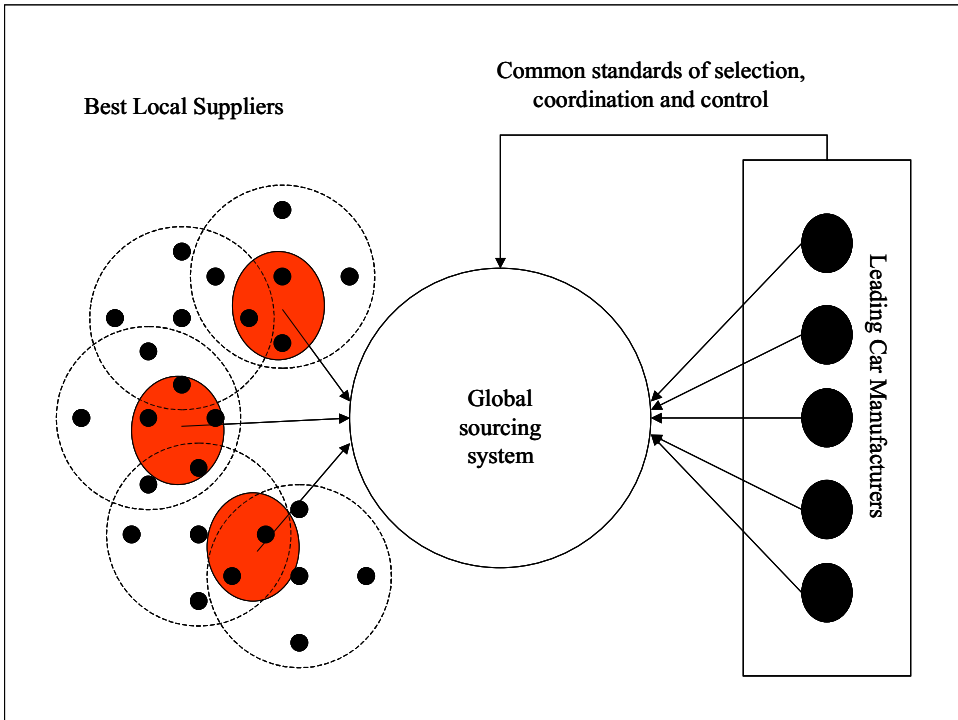


Fig. 7.1. The Coupling model of trust creation

8 THE LOOSELY COUPLING MODEL OF TRUST CREATION

In the previous two chapters we analyze two alternative models of trust creation between local and global systems. The first, de-coupling, is based on the separation between these two dimensions of trust creation. In the second, coupling, these two dimensions of trust creation are integrated on the basis of common codified standards of trust. The aim of this third chapter is to show the existence of a third alternative, which is based on the moderate integration between local and global mechanisms of trust creation.

In order to characterize this third model we refer to two case studies. The first is the case of the industrial district of packaging machines, which is located in Emilia (central part of Italy). The second is the industrial district of footwear, located along the river Brenta close to Venice. These two districts have a completely different history. The first specializes on a high tech industry. The second, instead, specializes on a traditional industry. The first is of recent development. The second, instead, has a long-term tradition. Both districts, however, are facing a common problem, which is the problem of integrating local and global trust.

The solution that these two districts are currently experimenting is to implement a local information infrastructure to strength the value of existing relationships based on mutual trust. In order to increase the accessibility to the local system a number local integrators are emerging. The function of these integrators is not, as in the case of decoupling system, to create a barrier between local and global, but to make the interaction

between these two dimensions transparent. Global standards of selection and control are not directly implemented into the local system, but adapted to local conditions. Local integrators, in fact, do not take responsibility only for the quality and trustworthiness of their performances, but for the quality and trustworthiness of the entire system of local relationships. The competition between local integrators is the guarantor for the quality and trustworthiness of the connection between local and global systems.

8.1 The industrial district of packaging³³

The district of packaging is distributed between the provinces of Bologna and Modena in Emilia. It is part of a large regional system specializing in the mechanical sector. The origin of this regional system can be traced back to the beginning of the nineteenth century. The area initially specialized in the production of agricultural machinery. The development of the automotive industry stimulated the development of small-sized car manufacturers and producers of car components. The most important producers of luxury cars, such as Ferrari and Lamborghini, are situated within the area. Over the years this regional system has developed other specializations, such as the production of machinery for the ceramic industry. This process of diversification has mainly been stimulated by the proximity to other industrial clusters, such as those of ceramics (Modena), textiles (Carpi) and so forth. The regional system, therefore, has become specialized in the processes rather than in specific products.

The firms specializing in packaging machinery are mainly clustered in the northern part of the province of Bologna and partly in the province of Modena. The district produces one third of the automatic packaging machinery operating worldwide. The major export markets are Germany, the USA and Japan. The initial development of the district was a consequence of the localization of a few large packaging companies in the area, such as Tetra Pack. These companies initially outsourced the production of components to networks of small- and medium- sized enterprises. This process has stimulated the formation of a number of small- and medium-sized companies specializing in the engineering and designing of special purpose packaging machines. The continuous spin-off of engineers and designers from this original group of firms has supported the further

³³ This case studies on interviews to the local artisan associations and the entrepreneurs of COXANET.

consolidation of the district. Large packaging companies do not currently develop their machines inside, but instead contract out the design to local suppliers, who provide the complete packaging machines.

Recent developments in the district have been characterized by the growing demand for integration of the supply chain. Packaging machines are complex and have a long life cycle. Their design and production require the ability to coordinate and integrate the activities of a large number of actors specializing in single phases of the supply chain. This problem is not limited to the phase of design, but also incorporates the phase of after sale. Customers of these machines, therefore, prefer to rely on a single source of supply, which provides an integrated service, rather than having to coordinate the contribution of a large number of actors. The packaging district embeds all the resources necessary for designing and producing special purpose packaging machines. However, these resources are highly dispersed and they are brought together in order to respond to specific orders and requirements. The problem with this business model is that there is no formal relationship between firms involved in a specific project. The question is: who can guarantee that a small firm, which has designed a specific component, will exist in five years time?

In order to solve this problem a number of firms are beginning to specialize in the integration of local supply chains. The function of these companies is to organize and structure the interaction between customers and local networks of specialized firms. These companies take full responsibility for the quality and trustworthiness of the service provided. Therefore, they internalize the risks of adverse selection and free riding. Furthermore, in order to improve the capacity of their customers to monitor the local supply chain they provide full accounts of the parties involved, their curriculum and their respective responsibility. They also integrate the information relative to the status of the project itself. Their function, therefore, is to multiply the transferability of the local basis of trust by converting their experiences of interaction and cooperation within the local system into a format appropriate by final customers, who are located outside the system.

An example of a company that has developed this role is IMA. This company was founded in 1961. It mainly specializes in the engineering of packaging machinery for the

food and pharmaceutical sectors. It is a leading producer of packaging machines for filter tea bags holding a market share of 70%. The company is structured in three divisions: pharmaceutical and cosmetics; tea, coffee and drinks; and food. In order to respond to the market request for integration of the supply chain, in 1994, IMA promoted the formation of a local and integrated network of specialized firms. In this network, IMA plays the role of project leader and prime contractor in the supply and maintenance of special purpose packaging machinery. The role of project leader comprises of the following functions: the definition of functional specifications of the machinery; the costs and time scheduling of the project; the process of coordination and control of the project; the selection of partners; and the testing of the final product. It should be noted, however, that the participation in a project is not restricted to the parties affiliated to the network. If there are more competitive and innovative firms available in the market these may be included in the project. This condition is required in order to stimulate the competitiveness and innovativeness of the affiliates.

Once the functional specifications of the project have been completed, the phase of coordination and implementation of the project is outsourced to DI.CO, which plays the role of the center for operational coordination of the supply chain. DI.CO is a group of firms that vertically integrates part of the competencies required for the fulfillment of a specific project. The coordination center is responsible for coordinating the production process according to the requirements of quality, cost and delivery time defined in cooperation with IMA. It is also responsible for the development of procedures and timeframes for the coordination and control of the supply chain. The selection of DI.CO as a center for operational coordination has commonly been agreed between the members of the network. Within IMA the management of the project is entrusted to a team of managers, who integrate competences from different departments (design, assembly, purchasing, planning and times and methods). The aim of this team is to support DI.CO and the network of suppliers in solving specific technical problems, which may emerge in the implementation phase.

In order to develop this network, IMA has used the value of existing relationships of mutual trust. The members of the network are all located within the same district. They have had previous experience of working and cooperating together. Its function as a

strategic center has increased the capacity for its customers to gain access to an established network of mutual trust. IMA, in fact, is directly responsible for the quality of the project and, indeed, for the quality of the partner chosen to develop the project. The development of a coordination center facilitates the process of socialization of trust and its internalization. The establishment of a coordination center also has two other major effects. The first is to reduce the cost of collecting information about the state of the project and, indeed, the possibility of giving punctual information to the final customer. The second is to improve the capacity of IMA to monitor the relative performance of suppliers and, indeed, its capacity to select partners.

Another example is Coxanet. This is a temporary association between enterprises specializing in the production of a specific module of packaging machines for drinkable liquid, such as fruit juice. Tetrapak, a Swedish based multinational industry leader, is the main client of Coxanet. Tetrapak has one of its main production plants in Modena. Tetrapak internally design the concept of the machine. The engineering of the single modules is contracted out to a number of local companies. Tetrapak recently launched a program of reorganization, which aimed to modularize the supply chain and drastically reduce the source of supply. Furthermore, this project also intended to develop an EDI system to improve the capacity of Tetrapak to monitor the supply chain. In order to select its partners, Tetrapak defined a set of parameters to qualify the trustworthiness and quality of their partners, such as the financial and organizational structure, and the dependence of suppliers on Tetrapak³⁴.

COXA, which is the prime contractor of the network, did not comply with these parameters. The firm was too small and, furthermore, it did not have the financial capacity to vertically integrate the entire process as required by Tetrapak. However, it could rely on a network of specialized suppliers to perform the complete process. Tetrapak, however, argued that they did not have enough guarantees for the stability of the cooperation between these firms. The local artisan association, therefore, proposed the formation of a temporary association between these firms in order to strengthen the value and transparency of the relationships between these firms. In this temporary association,

³⁴ The partner of Tetrapak for instance should not depend on Tetrapak for more than 30% of their annual turnover. This parameter has been defined in order to stimulate the competitiveness and innovation of the partners.

COXA, is the prime contractor responsible for the entire project. Within the network, however, each member is responsible for the fulfillment of its own tasks.

This project has not been completed yet. Therefore, it is not possible to pass a definitive judgment on the success of the project. However, the results, up to now, have been positive. The four companies involved are developing a common integrated production plant. They are also developing a common computerized system to improve their level of integration and their capacity to provide reports to their customers. They are involved in the development of a project of quality certification, which aims to quantify not only the quality of the single firms, but also the quality of the network as a whole. According to the entrepreneur of COXA, the major advantage of this form of cooperation is the increase in visibility and transparency of the relationships between members, both inside and outside the network, without the need to bear the costs associated with the vertical integration of the project.

8.2 The case of the footwear district of the Riviera del Brenta³⁵

The district of the Riviera del Brenta is situated between the cities of Venice and Padova, along the banks of the River Brenta. This district specializes in the production of high quality footwear, mainly for the women's sector. The number of firms belonging to the district is almost 800. The number of employees is 9000 with an average size of 11 per firm. The number of shoes produced annually is around nine to ten million, of which three quarters are exported. In 1996, the district produced revenues of 719 billion Lire (about 326 billion US\$) with an average of 3 billion Lire (about 1.5 billion US\$) per firm.

The origin of the district can be traced back to the medieval tradition of the Venetian guild of the *callegheri* (shoemakers). The initial development, however, can be traced back to the foundation, in 1898, of the first industrial company for the production of shoes by a local entrepreneur (Luigi Voltan), who imported to the Riviera methodologies and technologies learned in the USA. He played a central role in stimulating the development of that specific social tissue, solidarity and cooperative practices, which still

³⁵ This case studies is an interpretation of Belussi (2000) and Fontana (1998)

characterize the district. For instance, as vice mayor of Stra' (one of the small municipalities of the Riviera), he founded the construction of public houses, the creation of a consumers' cooperative, and the foundation of a school to train unemployed people in shoe-manufacturing. Furthermore, the local Catholic associations also contributed to strengthening the local social tissue by sponsoring the formation of collective funds for the industrialization of the area.

The process of development of the district can be characterized by distinguishing between three major phases: start-up, take-off and consolidation. The phase of start-up lasted from the end of the eighteenth century to the end of the Second World War. It was characterized by the presence of one large and vertically integrated firm, Voltan, and a few small local laboratories. The second phase lasted from the end of the Second World War to the 1970s. There are four major aspects characterizing this phase: the explosion of national demand, the development of a few large and vertically integrated companies, the emergence of a large number of small- and medium-sized laboratories and the initial internationalization of the district. In 1955, the district produced 5.5 million pairs of shoes, 30% of which were exported. In the following years, the percentage of pairs of shoes exported grew from 39% of 6.8 million in 1956 to 60% of 12 million in 1969.

The period of consolidation started at the beginning of the 1970s. This phase was characterized by the intensification of national and international competition. In this phase, the Brenta district began to suffer from the competitiveness, on the one hand, of other Italian industrial districts and, on the other, of emerging countries, such as China, Brazil and ex-Yugoslavia. The disintegration of the production process characterizes the evolution of the district in this phase. There are two major motivations behind this development. The first is that large- and medium-sized firms in the district began to contract out a large part of their internal production in order to cut down their internal costs.³⁶ The second is that most of the local firms decided to position themselves in the sector of high quality women's shoes. This choice has limited the degree of automation applicable to the production process. Therefore, it has restricted the economic convenience of vertically integrating the production process.

³⁶ The efficiency of this strategy is strongly tied to the specific character of the social context of the district, which is based on dense networks of social relationships based on mutual trust. The prevalence of mutual trust, in fact, enables to cut down on the cost of coordination and integration between firms.

The district is now facing major problems. Local firms work mainly as subcontractors for large companies in the fashion industry, such as Prada, Valentino and so forth. Therefore, they do not sell their own branded products. It follows that they are highly exposed to the competition of emerging countries. Furthermore, a large part of their production is still produced locally. Local entrepreneurs do not contract out their production to emerging countries because they do not trust their counterparts. Therefore, the district is in the dangerous position of potentially becoming completely isolated. It has not developed any form of relationship with the final market nor with the market of suppliers.

The relevance of this case study, however, is linked to the fact that this district is one of the few in Italy that has been able to establish a community portal to support “virtual integration”, through information and communication technologies, both within the district and between itself and the external market. The development of this community portal has been strongly sponsored by the local association between firms in the footwear sector (ACRiB). It is too early to express any evaluation about the success of the project. The experience of Sprintel in Prato has shown that technological-failure and -rejection may take place with a long delay. This initial success, however, seems to be explained, at least in our perspective, as consequence of one major factor: the lack of local powerful coalitions, which are able to obstruct the diffusion of this technology.

It is useful to highlight, from this perspective, the major differences between this case and the one of eyewear. Also in the case of eyewear, in fact, local associations are making the attempt to sponsor the introduction of new electronic media to stimulate the integration between local firms and between the local system and the global one. However, the results, until now, have not been as positive as in this case. Our argument, from this perspective, is that the presence of a strong leadership within the local system inhibits the role of local associations as major driver of the process of innovation. In the case footwear, which is characterized by the lack of local leadership, the local association, instead, is still able to use its influence to make the interests of local firms converge into common

projects, which are considered relevant for the competitiveness of the local system as whole.

The district of the Riviera del Brenta seems to be moving toward a loosely coupling model of trust creation between local and global systems. The introduction of codified procedures of trust does not aim to replace the value of local relationships. On the contrary, these systems of trust are constructed on top of existing relationships of mutual trust between local companies. From this perspective, it should be noted the key role of the local association as sponsor for the diffusion of codified standards of trust.

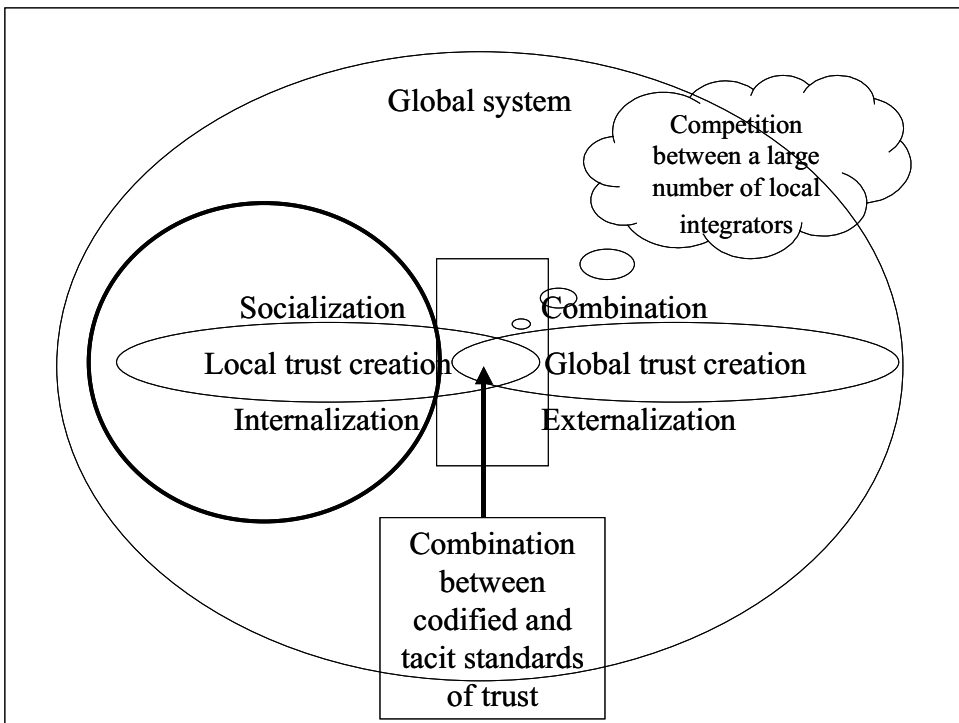


Fig. 8.1. The loosely coupling model of trust creation

8.3 Conclusion

In this chapter we explore a third alternative to integrate local and global creations of trust. In this model, differently from the previous two, the creation of trust is entrusted to a number of local integrators, which compete on their ability to provide connectivity to local parties and integrate their competencies (see fig. 8.1). Information and

communication technologies, from this perspective, are not used as media to impose a common standard practice, as in the case of coupling system, but as media to strength the value of local relationships and face-to-face interaction. The major advantage of this model, in our perspective, is that it facilitates the combination between local experiences and global knowledge. Local integrators, in fact, translate their experience of local embeddedness into global codes, which are appropriable into the global system, and vice versa. The competition between local integrators guarantees the quality and trustworthiness of the translation.

9 CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This thesis has focused on the problem of sustaining the creation of trust between local and global systems. Trust has been characterized as distinguishing between three perspectives: under-socialized, over-socialized and embedded. The under-socialized perspective is based on the assumption of self-interest seeking rationality. Trust is based on information and the calculation of self-interest and those of counterparts. The over-socialized perspective is based on the assumption of behavioral rationality. Individuals behave according to a system of norms and values, which have previously been internalized. Trust is defined as a cultural norm, which prevails within communities of honorable people. The embedded perspective is based on the assumption of network rationality. Individuals mutually influence their behavior through a system of interpersonal relationships. Trust is defined as an evolutionary characteristic of the relationships between people. Trust evolves as a consequence of the accumulation of interpersonal experience within a network. The structure of the network influences the way trust develops within a relationship.

We have argued that the differences between these three perspectives could be overcome using knowledge as a common denominator. From this perspective, we have focused on the distinction proposed by Polanyi between tacit and codified knowledge. Tacit knowledge is based on the accumulation of experiences within a specific social

context. Codified knowledge is based on the formalization of a set of rules. The value of codified knowledge has been abstracted or virtualized. It has been separated from its original context on the basis of a number of assumptions about its specific nature and structure (virtualization of the context). This context is virtual because it contains only part of the complexity that is embedded in reality. On the basis of this categorization we have introduced the distinction between tacit and codified trust. Tacit trust is based on tacit knowledge. Therefore, tacit trust is based on the knowledge of the context. Codified trust is based on codified knowledge. It is based on the knowledge of the rules.

Tacit and codified knowledge are characterized by different degrees of transferability. The value of tacit knowledge is tied to the knowledge/experience of a specific social and cultural context. Its value can not be exported. It can only be shared between its members. Therefore, tacit knowledge is local. Codified knowledge, on the other hand, is independent from the characteristic of a specific context. Its value is contained within the language that has been used to codify a given set of rules. Therefore, codified knowledge is transferable to anyone knowing the language used to express or codify that knowledge. The more the language used is commonly known, the more that knowledge is globally accessible. Therefore, the distinction between local and global depends on the degree of codification and the diffusion of the language used to codify knowledge.

We have argued that there is a gap between codified and tacit knowledge and, indeed, between global and local systems. Codified knowledge can not be directly applied to a specific context. The reason is that there is a gap between the context of codified knowledge, which is virtual, and the context of tacit knowledge, which is real. Therefore, the value of codified knowledge, in order to be transferred to a specific (local) context, has to be adapted to the characteristics and nature of the local context itself. It is necessary to develop an analysis of the gaps that exist between the assumptions embedded within the context of codified knowledge and the assumptions embedded within the local context. Local knowledge, on the other hand, can not be directly appropriated within a global system. The value of local knowledge has to be translated into a language accessible and appropriable in the global system. The capacity to create knowledge is tied to the local

system's ability to translate the value of local experiences into languages that can be appropriated in the global system and, *vice versa*.

Therefore, the problem of sustaining the creation of trust between local and global systems has been defined as the problem of translating the value of local experiences of mutual trust into a language appropriable in the global system and, *vice versa*. We have used the term sustainable in order to highlight the necessity of maintaining a balance between those two dimensions. The global system can not simply replace the local one. On the other hand, the local system can not simply be disconnected from the global one. The competitiveness of local systems is tied to their capacity to reinterpret their specificity within a global context of rules and languages.

In order to investigate the problem of trust creation between local and global we have developed a model of the process of trust creation. This model has been developed from the model of knowledge creation proposed by Nonaka and his group. The process of knowledge creation can be structured into four major phases: socialization, externalization, combination and internalization. Socialization is the process through which knowledge is socialized within an organization. Externalization is the process through which knowledge is converted into codified knowledge, which can be transferred outside the organization. Combination is the process through which knowledge is transferred to other systems and combined with the knowledge embedded within those systems. Finally, internalization is the process through which knowledge created outside of the organization is converted into local practices and experiences.

Our contribution has been to develop a model of the process of trust creation based on Nonaka's theory. We have shown that trust can also be categorized into tacit and codified. We have also shown that the process of trust creation is structured in four phases: socialization, externalization, combination and internalization. In the phase of socialization, trust is socialized within a community or organization. In the phase of externalization, trust is negotiated between communities or organizations in order to be converted into a transferable format. In the phase of combination, different trust systems are combined and integrated. In the phase of internalization, external sources of trust are integrated within the local community. Trust at the local level is based on the socialization and internalization of common norms and values. Trust at the global level is mainly the

product of the externalization and combination of codified sources of trust. The sustainability of the process of trust creation between local and global depends on the level of coupling between these two processes.

In the second part of the thesis we explore alternative ways of constructing trust between local and global systems through a number of case studies of Italian industrial districts. The model of trust creation, which we have developed in the first part of the thesis, has guided our exploration.

Chapter 5, from this perspective, has focused on the local process of trust creation. We show that trust is a critical factor for the development of industrial districts. The creation of trust within industrial districts is based on the combination between two factors. The first is culture. We showed that the origin of the culture of mutual trust, which characterizes these communities, traces back to the tradition of civic community in Middle Ages. We argued, however, that a common culture of trust is not sufficient to explain trust and cooperation within industrial districts. From this perspective, we showed that trust within industrial district is socialized on the basis of fair competition between local parties. The structure of industrial districts, in fact, stimulates their members to invest in mutual trust as way to gain reputation in the community. The value of this reputation, however, is not exportable outside the local community, because it is attached to the experience of interaction within the local network.

In the following three chapters we explored alternative strategies to externalize and internalize trust between local and global systems: de-coupling, coupling and loosely coupling. We use these three terms to emphasize the different level of coupling between the local process of trust creation and the global one. In the de-coupling model local and global are two completely separated dimensions of trust creation. The majority of local parties do not interact with the outside. The interaction between local and global systems is mediated by a small group of leading companies. The aim of these companies, however, is not to facilitate the interaction between local and global, but to increase the distance between these two dimensions of trust creation. The negative consequence of this model is that local parties are ever more dependent on these companies to be able to export their productions to the outside market.

The coupling model, on the contrary, is based on the codification of local relationships according to global standard of trust. The consequence of this strategy is that the local dimensions may lose its capacity to sustain the development of local small and medium business. In order to characterize this model we use the case of Fiat. We showed that the development of Fiat in the last three decades has been characterized by the progressive codification of trust along the value chain. This process of standardization has produced a progressive globalization of the automotive industry, which may progressively exclude cluster of small and medium enterprises from global competition.

In the previous chapter we present a possible alternative between coupling and de-coupling, which we call loosely coupling. This model is characterized by the development of a large number of local integrators or facilitators, which are responsible for the quality of the interaction between local and global. The major competence of these integrators is to externalize trust, from local to global, and internalize trust, from global to local. Their role, in other words, is to convert their experience of interaction within the local system into information and knowledge that can be appropriated outside the local system and vice versa. The efficiency of this solution depends on two major conditions. The first is the flexibility of global standards. Global standards should not be strict, but open to interpretation. The second is competition between local integrators/facilitators. Competition between local integrators should reduce the risk of opportunistic interpretation of the standard.

It should be noted that information and communication technologies play a different role in each of these models. In the de-coupling model information and communication technologies do not play any relevant role in sustaining the creation of trust between local and global. It is only a media for improving the efficiency and effectiveness of the processes of information collection and exchange between local and global. In the coupling model information and communication technologies are the major media of trust creation. These technologies are mainly used to improve the capacity of selection, coordination and control between the firms in the global value chain. In the loosely coupling model information and communication technologies play a relevant role in sustaining the creation of trust between local and global. However, its role is interpreted

mainly as a media for improving the integration and value of existing relationships of mutual trust between firms.

Which, among the models identified, is the most sustainable? It is difficult to give a definitive answer to this question from the case studies. However, we believe that the most sustainable is the loosely coupling model. In the de-coupling model the trust distance between local and global is too large and tends to increase as a consequence of the negative role played by the local integrator. In the coupling model, on the other hand, the distance between local and global is too small and tends to diminish with time as a consequence of the negative role played by global players. The loosely coupling model produces instead both convergence and divergence between local and global. The local adoption of global standards of trust tends to reduce the distance between local and global. However, the local adoption of global standards of trust tends to strengthen the value of the local dimension as a network of relationships between community members. Therefore, it also represents the basis for the renovation of local differences, which characterize the community as a whole.

What are the limitations of this thesis and what future research directions can be pursued? The first limitation of this thesis is that we have referred to case studies coming from a single cultural context. Furthermore, the cultural specificity of this context has only been partially investigated. We have simply distinguished between tacit and codified in order to characterize the distinction between specific knowledge, which is embedded within a specific context, and 'universal' or global knowledge, which is commonly accepted. However, we have not investigated the specificities of the context itself and how these influence the process of trust creation and the models of intermediation between local and global. In order to improve our work we need to identify a set of variables to characterize cultural contexts. From this perspective, the literature on cross-cultural cooperation may be useful.

The second limitation is that we have only focused on geographically clustered communities. We have not considered the recent phenomena of virtual communities. There are a number of interesting questions related to virtual communities. The first is how trust is created and established between community members. In the case of industrial districts, in fact, the basis of trust between members had already been established. Therefore, the

question is how a number of parties belonging to different cultural contexts develop a set of common norms and values, which regulate their interaction and sustain the development of their relationships. From this perspective there are a number of case studies that can be analyzed.

The most famous is probably the Linux community. This is a community of software developers belonging to different cultural contexts and different firms who cooperate on the development of the Linux operative system. This community is based on the norm of the *copy left*, which claims that anyone can access for free the source code of this operative system and make changes that best satisfy his particular requirements. The only condition is that the modified sources of code are handed back to the community. Therefore, the Linux operative system is the property of the community itself and not of its members. The advantage of this organizational model is that it stimulates the multiplication of the number of variants of each component of the operative system.

In our perspective, there are three main conditions that underlie the success of the Linux community. The first is the clever design of the operative system, which is extremely modular. Therefore, each member or group of members is free to modify each component of the operative system autonomously from the others. The only condition is that changes made comply with the standard of interoperability between the different components. The second condition is a common passion for Linux as an operative system. The members of the Linux community are all hackers. They do not work on a project because they have to. They work on a project because they believe in its goodness. They basically work for free. The major advantage associated with community membership is the possibility of using the work of others to develop customized solutions. The third condition characterizing the community is the commitment toward the development of software free-of-charge. Developing software is a mission and not a job.

Most users of operative systems are unable to directly modify the source code according to their specific requirements. In order to improve the accessibility and transferability of the value created within the Linux community a number of 'distributors' have emerged (Afuah et.al., 2001). The most famous is Red Hat. The update of the Linux operative system, as a consequence of the number of new releases developed, is difficult to manage. Red Hat has developed a software system called Red Hat Package Manager

(RHPM), which is a communication protocol and a tool that supports final users, who do not have the necessary competences, to up-date and customize Linux. Simplifying the process of installation and up-date of Linux has been one of the key success factors for Red Hat.

In an interview, Bob Young, the CEO of Red Hat, argued that Red Hat is in the business of branding. In order to explain his claim he used the metaphor of ketchup. All the ingredients of ketchup are usually available in any kitchen. Therefore, how on earth is it possible for Heinz to sell ketchup? Heinz has developed a brand that simplifies the process of buying ketchup within a supermarket. We know that Heinz makes good ketchup and we trust them to do it. Why should we do it by ourselves if it costs less to buy it in the supermarket? The same is true for Red Hat. All the ‘ingredients’ of Linux are available over the Internet for free. Red Hat only sells its reputation for being able to integrate, according to the specifications of the customer, at a lower cost the latest release of Linux. It should be noted that Red Hat is no longer the only distributor in this business. There are a number of other competitors, such as Caldera, Mandrake and so forth, who compete on their ability to simplify and increase the trustworthiness of the connectivity between local and global.

In this thesis we have explored the problem of sustaining the creation of trust between local and global. However, we would like to develop a more formal theory about how to govern the interface between these two dimensions of trust. From this perspective, a good metaphor that we would like to pursue is between the problem we have investigated and the one of the “last mile” in the telecommunications industry. The “last mile” is the infrastructure that connects the final customer to the first telecommunication-switcher. The previous incumbent owns this infrastructure and it is not economically convenient to develop an alternative one. Therefore, the question is how to regulate the accessibility to the “last mile” in order to guarantee equal market opportunities to all market players, but, at the same time, to prevent competition eroding the quality of the infrastructure itself. This problem is similar to the problem of governing the connectivity between local and global. The question is how to open up the local market in order to guarantee equal opportunities of access between local and global, but, at the same time, to prevent

competition eroding the value of the local context as a common ground of cooperation between local firms.

Furthermore, the results of this thesis could be extended in order to consider the process of trust creation in the risk society. The concept of risk society has been proposed by the German sociologist Beck. The development of modern society, according to Beck, has been characterized by the production of a new category of risks, which he calls global. Examples of this category of risks include nuclear disasters such as Chernobyl, global warming or so-called mad cow disease. These risks are global for two major reasons. They span across national boundaries. The consequences of Chernobyl, for instance, expanded to a large number of European countries. The second is that we, as individual, are equally exposed to the potential consequences of those risks independently from our social status and class (Beck, 1992).

There are other two major aspects that characterize this category of risk. The first is that they are “invisible”. Human cannot directly perceive them. Our perception of these risks is dependent on experts’ and scientists’ knowledge (codified knowledge/codified trust). The second is that the consequences of these risks cannot be calculated. The expected consequences of these risks, in fact, are dependent on experts’ knowledge and assumptions. The combination of these two factors implies that experts disagree, on the one hand, about our real exposure to these risks and, on the other, about the possible solutions, such as in the case of the risk of global warming. According to Beck, we lack of adequate institutional mechanisms through which these risks can be monitored and action taken. In other words, we lack of mechanisms to sustain trust, both at locally and globally, with respect to this category risks. The study of this problem could be a possible extension of the results of this thesis.

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10 SUMMARY IN ENGLISH

This thesis focuses on the problem of trust creation between local and global systems. Giddens (1990) argues that the development of modern society is characterized by the progressive time-space distancing between social activities. This does not simply mean that social interaction takes place between parties that are located into different places, but also that local interactions are ever more mediated by non-local institutions and technologies, such as in the case of a local credit card payment. The problem of trust, from this perspective, is defined as the problem of creating compatibility between faceless commitments, which are codified into global institutions and systems of trust, and face-to-face working commitments, which are embedded within local networks of trusted relationships.

Our starting point, in order to investigate the problem, has been the literature on trust. This literature, according to Granovetter (1992), can be organized into three perspectives: under-socialized, over-socialized and embedded. These three perspectives are grounded into three different assumptions on human rationality, which are respectively: self-interest seeking, behavioral and network. The assumption that scholars make on the nature of human rationality has major implications on the way they conceptualize trust.

In the under-socialized perspective, trust is conceptualized as a rational choice, which is based on the calculation of the risks involved within a social

transaction/interaction. Trust, from this perspective, is based on the codification of trustworthy mechanisms and institutions of coordination and control. In the over-socialized perspective, trust is conceptualized as a positive moral norm, which prevails only within specific cultural settings. The basis of trust, therefore, is culture and community-membership. In the embedded perspective, trust is a norm that evolves within social and economic networks. It is through their daily experience of interaction within specific cultural and social settings that parties, be their individuals or firms, mutually learn about their respective attitudes and competences. From this perspective, therefore, trust is constructed on a day-by-day basis.

We argue that the distance between these perspectives can be reduced using knowledge as common denominator between them. Trust, like knowledge, is based on beliefs. The two concepts differ only for the degree of certainty that we, as society, place on the truthfulness of those beliefs. Therefore, trust and knowledge can be considered the “ingredients” of the knowledge creation process through which we develop a social understanding of reality.

In order to develop our model of trust creation we refer to the model of knowledge creation proposed by Nonaka and his group. This model is based on the separation between tacit and codified knowledge. We argue that the same categorization applies to trust. The under-socialized perspective on trust, in fact, focuses mainly on codified trust and on the process of trust codification. Over-socialized and embedded perspectives, instead, focus mainly on tacit trust and, respectively, on the process of trust internalization and socialization.

Nonaka argues that the process of knowledge creation is a spiraling process structured into four phases: socialization, externalization, combination and internalization. In the first two phases social knowledge, which is embedded within a specific network of interpersonal relationships, is converted into codified knowledge, which is contained into artifacts. This process responds mainly to the need to translate local knowledge, which is embedded within local networks of social and economic relationships, into global knowledge, which is appropriable outside the local system. In the second two phases global knowledge is converted into tacit knowledge/local practices. Global knowledge is the product of the combination between codified components of knowledge. This second

process, therefore, responds mainly to the need to re-interpret local practices with respect to innovations produced within the global system.

The competitiveness of local systems, according to Nonaka, depends on the capacity to dynamically balance the combination between local experiences and global/codified knowledge. An excess of codification within the local system exposes it to global competition. An excess of de-codification, on the other hand, reduces the capacity of the local system to create and export knowledge.

Nonaka's theory is useful to conceptualize the process of trust creation between local and global systems. Trust, locally, is produced on the basis of socialization and internalization of common norms and values. Trust, globally, is produced on the basis of combination between codified institutions and systems of trust. The capacity of local systems to create trust at the global level depends on their capacity to translate the trust that is embedded within the local system into a code that is appropriable in the global one and vice versa.

In the second part of this thesis we use the model of trust creation to explore the structure of this process in a number of case studies of Italian industrial districts. From this perspective, we show that there are, at least, three model of trust creation between local and global systems: de-coupling, loosely coupling and coupling. These models differ for the degree of coupling between local institutions and systems of trust and global ones. We argued that the most sustainable model is the loosely coupling one. This is based on a large number of local integrators, which compete on their capacity to translate trust between local and global systems. The competition between these local integrators better support the dynamic combining between local mechanisms and institutions of trust creation and global ones.

11 SUMMARY IN DUTCH

Dit proefschrift richt zich op het probleem van het creëren van vertrouwen tussen lokale en wereldwijde systemen. Giddens(1990) betoogde dat de ontwikkeling van de van de moderne maatschappij wordt gekarakteriseerd door de progressive tijd-ruimte distantiëring tussen sociale activiteiten. Dit betekent niet alleen dat sociale interactie plaats vindt tussen partijen die op verschillende locaties gesitueerd zijn, maar ook dat lokale interacties steeds meer gemedieerd worden door niet-lokale instituten and technologieën, zoals in het geval van een lokale credit card betaling. Het probleem van vertrouwen is vanuit dit perspectief gedefinieerd als het probleem van het compatibiliteit creëren tussen gezichtsloze verplichtingen, die zijn gecodificeerd in de wereldwijde instituten en systemen van vertrouwen, en face-to-face werkverplichtingen, die zijn ingebed in lokale netwerken van vertrouwde relaties.

De literatuur over vertrouwen was voor ons het beginpunt om het probleem te onderzoeken. Deze literatuur kan volgens Granovetter (1992) verdeeld worden in drie perspectieven: onder-gesocialiseerd (*“under-socialized”*), over-gesocialiseerd (*“over-socialized”*) en verankerd (*“embedded”*). Deze drie perspectieven berusten op drie verschillende aannames over menselijke rationaliteit, respectievelijk: zoekend naar eigenbelang, gedrag en netwerk. De aanname die wetenschappers maken over de natuur

van menselijke rationaliteit heeft grote implicaties op de manier waarop zij het begrip vertrouwen conceptualizeren.

Vanuit het onder-socialistische perspectief wordt vertrouwen geconceptualiseerd als een rationele keuze, die is gebaseerd op de calculatie van de risico's die gepaard gaan met een sociale transactie/interactie. Vertrouwen is vanuit dit perspectief gebaseerd op de codificering van vertrouwenswaardige mechanismes en op coördinerende en controlerende instituten. Vanuit het over-gesocializeerde perspectief wordt vertrouwen gedefinieerd als een positieve morele norm, die slechts binnen een specifieke culturele setting naar voren komt. De basis van vertrouwen is daarom cultuur- en gemeenschapslidmaatschap. Vanuit het verankerde perspectief is vertrouwen een norm die zich ontwikkelt binnen sociale en economische netwerken. Het is door de dagelijkse ervaring in interactie binnen een specifieke en culturele setting dat een partij, dan wel hun individu's dan wel hun firma's, geleidelijk leert over zijn respectievelijke houdingen en bekwaamheden. Vanuit dit perspectief wordt vertrouwen daarom opgebouwd op een dagelijkse basis.

We betogen dat de afstand tussen deze perspectieven terug gebracht kan worden door het gebruik van kennis als een gemeenschappelijke noemer tussen hen. Vertrouwen is zoals kennis gebaseerd op opvattingen. De twee concepten verschillen alleen op de hoeveelheid zekerheid die wij als maatschappij plaatsen op de waarheidsgetrouwheid van deze opvattingen. Daarom kunnen vertrouwen en kennis worden beschouwd als de "ingredienten" van een kennis creërend proces door welke wij een social begrip van realiteit ontwikkelen.

Om een model voor het creëren van vertrouwen te ontwikkelen verwijzen we naar het model van kennis creatie voorgelegd door Nonaka en zijn groep. Dit model is gebaseerd op de scheiding tussen stilzwijgende ("*tacit*") en gecodificeerde ("*codified*") kennis. We argumenteren dat dezelfde categorizatie toepasbaar is op vertrouwen. Het onder-gesocializeerde perspectief op vertrouwen richt zich in feite voornamelijk op gecodificeerd vertrouwen en op het proces van vertrouwens codificatie. Over-socialized en verankerde perspectieven richten zich daarentegen voornamelijk op stilzwijgend vertrouwen en respectievelijk op het proces van de internalizatie en socializatie van vertrouwen.

Nonaka beweert dat het proces van het creëren van kennis een spiraliserend proces is, wat gestructureerd is in vier fases: socializatie, externalizatie, combinatie en internalizatie. In de eerste twee fases wordt sociale kennis, die veranderd ligt in een specifiek netwerk van interpersoonlijke relaties, omgezet in gecodificeerde kennis, wat wordt beheld in artefacten. Dit proces beantwoordt voornamelijk aan de behoefte om lokale kennis, die is verankerd in lokale netwerken van sociale en economische relaties, te vertalen naar wereldwijde kennis, die geschikt is buiten het lokale systeem. In de twee daarop volgende fases wordt wereldwijde kennis omgezet in stilzwijgende kennis/lokale praktijken. Wereldwijde kennis is het product van de combinatie tussen gecodificeerde componenten van kennis. Dit tweede proces beantwoordt daarom voornamelijk aan de behoefte om lokale praktijken te her-interpreteren met respect naar innovaties geproduceerd binnen het wereldwijde systeem.

De concurrentiepositie van lokale systemen hangt volgens Nonaka af van de capaciteit om op een dynamische wijze de combinatie tussen lokale ervaringen en wereldwijde/gecodificeerde kennis te balanceren. Een overschot aan de-codificatie binnen het lokale systeem reduceert aan de andere kant de capaciteit van het lokale systeem om kennis te creëren en te exporteren.

Nonaka's theorie is nuttig om het proces voor de creatie van vertrouwen tussen lokale en wereldwijde systemen te conceptualizeren. Lokaal vertrouwen wordt geproduceerd op basis van socializatie en internalizatie van gemeenschappelijke normen en waarden. Wereldwijd vertrouwen wordt geproduceerd op basis van een combinatie tussen gecodificeerde instituten en systemen van vertrouwen. De capaciteit van lokale systemen om vertrouwen te creëren op wereldwijd niveau hangt af van de capaciteit om vertrouwen in een code die bruikbaar is in het wereldwijde systeem en vice versa te vertalen.

In het tweede deel van dit proefschrift gebruiken we het model voor de creatie van vertrouwen om de structuur van dit proces te verkennen aan de hand van een aantal case studies over Italiaanse industrieële districten. Vanuit dit perspectief laten we zien dat er in ieder geval drie modellen voor het creëren van vertrouwen tussen lokale en wereldwijde systemen zijn.: ontkoppeling (*de-coupling*), losse koppeling (*loosely coupling*) en koppeling (*coupling*). Deze modellen verschillen wat betreft de mate van

koppeling tussen instituten en systemen van vertrouwen op lokaal en wereldwijd niveau. We betogen dat is de losse koppeling het meest ontvankelijke model is. Dit is gebaseerd op een groot aantal lokale integrators, die concurreren op hun capaciteit om vertrouwen te vertalen tussen locale en globale systemen. De concurrentie tussen deze locale integrators bevordert op een betere wijze de dynamische vereniging tussen locale en wereldwijde mechanismen en instituten voor het creëren van vertrouwen.

CURRICULUM VITAE

Andrea Ganzaroli graduated in Statistics and Economics from the University of Padua. Subsequently, he worked as junior research consultant at Consorzio Venezia Ricerche, where he focused on the organizational and strategic impacts of Electronic Data Interchange (EDI). From 1996 till 2000, he was employed as Ph.D. student at ERIM and EURIDIS, Erasmus University Rotterdam. He currently works as assistant professor at SDA Bocconi, Milan. He teaches at the Bocconi University and at the IULM University, Milan. He participated to a number of research projects funded by the European Commission. His academic work has been presented in international conferences and published in books.

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Creating trust between local and global systems

This thesis focuses on the problem of creating trust between local and global systems. The development of global institutions and technologies, such as the credit card system, tends to replace the value of local relationships of trust based on mutual knowledge and to standardize the way trust is established and created between people and firms. In this thesis we argue that the trust embedded within local networks of relationships represents a value for the whole global society. In this perspective we provide three major contributions. The first is to develop a model to interpret the process of trust creation between local and global systems. The second is to apply this model in a number of case studies of Italian industrial districts. The third is to highlight advantages and disadvantages associated to alternative strategies of trust creation between local and global systems.

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