The Adoption of Quality Standards in Food SMEs: A Network Approach

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Abstract

The contemporary agrifood sectors have witnessed a rapid increase in the use of intangibles, i.e. inputs built upon information, knowledge and communication assets. Consequently firms, in their move towards competitiveness, try to innovate in line with these trends. Innovations in agrifood sectors were traditionally focused around new products and new technologies, and often seen as incremental. Innovations based upon intangibles need a broader view of what is innovation, especially in the context of food SMEs. Indeed food SMEs, which roles in the structuration and dynamism of the food economy in Europe is crucial, have at the same time difficulties and limitations in their innovativeness capacity for intangibles. The main objective of the communication is to better understand the conditions and processes of such innovations from a micro analytical point of view, centered on small and medium enterprises. The research is focused on one type of organizational innovation, the adoption of food quality standards.
The communication is structured as follows. In a first part (1) we characterize such innovations in food sectors around two core features: the identification of what is at stake, in terms of resources, competences and structures, when a company adopts such an innovation; and the identification of consequences such an adoption will have in terms of behavior of this company towards its environment. In a second part (2) we suggest addressing this question of innovation adoption through a methodology called social network analysis (hereafter SNA), or structural analysis of networks. This methodology is well appropriated to cope with the complexity and the micro/meso interactions that are essential features for the understanding of quality standard adoption. Then a syncretic analytical framework (3) is proposed, applied to a specific case study of a French food SME adopting an ISO 22000 standard (4). Discussion and concluding comments follow (5).

1 Organizational innovations in food SMEs

The development of food quality standards is a major trend in the modern economy and can be explained by several key drivers (1-1). The consequences, for food SMEs, are contrasted: it brings both opportunities and threats, but in any case the innovative capacity of food SMEs is at stake, especially when one considers the food standard as a key dimension of competitiveness (1-2). Consequently we suggest considering the complexity of this issue of innovation adoption thanks to a focus on the network partners and the interactions between the firms and these partners (1-3).

1.1 Food quality standards as organizational innovations: context and trends

Organizational innovations are usually defined in opposition with product and process innovations. Avermeate and Viaene (2004) consider that organizational innovations usually

take place when innovation is increasingly generated in networks or collaborative relationships. Science-based knowledge and technology may be involved but is not the main driver of such innovations.

The development of quality standards is one of the major trends of organizational innovations in agrifood sectors (Henson and Reardon, 2005). The main drivers of these tremendous changes are well known and can be summarized by a few key features: the need for control along the chain, the complexity of coordination problems between actors, the changing roles between public and private institutions in all the regulatory aspects of the economy (Henson and Humphrey, 2009; Nadvi and Wältring, 2004).

First of all, the need for a better control over food safety and other types of attributes is directly related to the increased concerns of consumers about these issues. Several major food crises have undermined its confidence. It is interesting to note that at the same time the competitive pressure between firms has created a lot of opportunities for the development of new attributes, i.e. for environment, ethics, and nutritional aspects. The extension of exchanges on such complex attributes is also a driver for more sophisticated food standards. Consequently, this is not only the recognition of what is good and safe for human consumption, but instead the identification of a complete spectrum of attributes, from search to experience and credence attributes, that is to be considered.

A second feature that explains the rise of food quality standards is the need for a better coordination between firms (Schiefer, 2003). The need for coordination is also linked to a context of globalization. Exchanges have progressively moved from local to national levels. Nowadays exchanges are facilitated by modern communication and transportation means and technologies. Consequently a wide range of heterogeneous and diverse connections from all across the world is brought together in business relations. The need for standardization and its recognition in different parts of the world is necessary.

A third feature is directly related to institutional aspects of food safety issues. As argued by researchers such as Hanataka, Bain and Busch (2005, 2006), the literature in food quality management usually emphasizes the operational aspects. In fact we will see that a complete understanding of quality management and quality standard adoption issues necessitates a broader view including organizational/institutional (Ménard and Valceschini, 2005) as well as interpersonal aspects.

1.2 The adoption of food quality standards: the situation of food SMEs

The important roles of food SMEs for the economy are well known. Food SMEs are, in most of the European countries, family-owned businesses with a low level of investment in research and development. As organizational innovations, food quality standards will affect food SMEs in many ways (Henson and Reardon, 2005). From a global food chain perspective, food quality standards will induce different forms of consolidation.

Among other drivers, market pressure (towards certification) scale of operations, brand capital can be considered as economical and managerial barriers. But several research works have shown that other type of barriers, such as a lack of trust in food safety and food quality requirements, an insufficient connection with enforcement officers, a deficient information system, may affect the process of adoption (Gellynck, Vermeire and Viaene, 2007). A third category of factors may limit innovation adoption and prevent compliance: individual factors such as a lack of motivation or a lack of knowledge in food safety requirements.

From this situation of food SMEs we suggest an interpretation of the process of innovation in terms of network and network effects. As we will see, this network dimension is a key phenomenon in innovation, and is even more important when firms are small and relatively isolated with a recurrent lack of resources and competences related to the context and the practical implementation of the innovation.

1.3 The network dimension in organizational innovations: types and roles of partners in the creation and adoption of quality standards in food SMEs

The first step in the analysis of organizational innovations from a network perspective is the identification of the main partners, both at organizational and individual levels. The embeddedness and decoupling effects (Lazega et al., 2007) must be identified for these two separate levels as they refer to specific phenomena, to be investigated by the analysis. We will consider firstly the main organizational partners, and secondly individual partners.
The main partners usually involved in food quality standard innovations are: standardization organizations, consulting firms, other SMEs, third-party certifiers. Let us consider their status and roles in the process of innovation.
-The main organization, at the international level, devoted to food standards is ISO: International Organization for Standardization. This organization has affiliated national organizations that will represent it. In France this organization is called AFNOR ("Association française de normalisation", French Association for Standardization), created in 1926. In 1947 AFNOR has took an active role is the creation of ISO. Today the AFNOR group is organized around several strategic business units, including standardization sensu stricto, training, consulting, auditing etc.
-Consultancy firms have a leading role is the development of food standards. This is a major consequence of the adoption of food standards for SMEs: the need for external stakeholders due to a lack in-house resources and competences. This consultancy firms are usually small companies and with a high degree of expertise specialization (on technical aspects, human resource management, organization and strategy etc.).
-Other (food) SMEs. The adoption of innovations is also part of a global social phenomenon, where competitive pressure, rivalry, mimetic behavior, opinion leadership have important effects. This is especially true at local and regional levels: family-owned companies are part of social communities of business leaders with participation in clubs, forums and other sporadic social events. One can include also suppliers and customers as they will influence the process of innovation and can be important drivers for change.
-Third party certifiers. Third party certification is an audit mechanism by which independent auditors ensure compliance with standards. The roles and situations of third party certifiers are an active dimension of the innovation process: indeed research works (see for instance Hanataka, Bain and Busch, 2005, 2006) have shown that auditors can be used strategically by actors and are not neutral agents.
-Regional and professional institutions: Public/professional bodies have developed, in most countries, innovation policies in order to promote and help SMEs in their projects. In France, institutions such as regional innovation agencies or Chamber of Commerce and Industry (CCI) support financially and institutionally a wide range of practical initiatives around innovation issues.
But how will these different partners affect innovation processes? How are their roles related to the success (or failure) of innovation adoption? As network effects that are affecting strongly the way organizational innovations become more complex, the question of

tools and concepts useful to better understand these processes is raised. The research about networks and network forms is rapidly growing but the emerging field of social network analysis (hereafter SNA), through the use of common concepts and formal methods, is well appropriate for the study of highly complex phenomena such as organizational innovations.

2 The SNA approach: principles, applications to innovation processes and interests

The social network analysis, or structural analysis of network forms, has its roots in linguistics and sociology. We will briefly present the core principle of this analysis and the basic concepts and tools, such as nodes and ties (2-1). Then we will focus on the SNA when it comes to innovations (2-2). A final part details the interests of such an approach for the study of quality standard adoption (2-3).

2.1 The SNA approach: core principles

Social network analysis is devoted the study of networks seen as a combination of actors (or nodes) and relations (or edges or ties). The basic assumption of all SNA researches is that actors are not independent but rather influence each other. Thus the network structure, or in other words its structural properties, makes sense and must be studied as a whole. For Borgatti (Borgatti and Li, 2009), one of the leading researchers of the field; “a fundamental axiom of SNA is the concept that structure matters (…). For examples, teams with the same composition of member skills can perform very differently depending on the patterns of relationships among members. Similarly, at the level of the individual node, a node’s outcomes and future characteristics depend in part on its position in the network structure. Whereas traditional social research explained an individual’s outcomes or characteristics as a function of other characteristics of the same individual (e. g. income as a function of education or gender), social network researchers look to the individual’s social environment for explanations, whether through influence processes or leveraging processes. A key task of social network analysis has been to invent graph-theoretic properties (such as the cohesion or connectedness of the structure) and the overall “shape” ‘(i.e. distribution) of ties” (Borgatti, Mehra, Brass, LaBianca, 2009, 893-894).

Thus it is important to acknowledge the fact that the SNA approach can encompass any types of nodes (actors) or ties (links) in the research. In usual typologies of ties studied in SNA, ties can be continuous (e. g. similarities) or discrete (e.g. money flows). These categories of ties can be applied to the two main categories of nodes, e. g. firm and individual. Ties can be directed (direction matters, such as in flows) or undirected (direction is not relevant or useless), weighted (i.e. measured) or unweighted (Wasserman and Faust, 2004).

2.2 Specificities of the SNA research on innovation

There has been an impressive amount of research on innovation using the SNA approach, but without any theoretical integration. It is important to recognize that SNA is not a theory per se (even if it produces important concepts and notions) but a methodological approach that helps to understand, through formal computer-based methods (matrix, graphs), complex network phenomena. This methodology can (should) be combined with other methodologies such as case study research (Scott, 1991).

Coulon (2005) proposed a survey of researches on innovation using SNA with a classification of networks in four categories, according to the characteristics of ties (weighted/unweighted, directed/undirected, see table 1). He showed that "there seems to be a large number of type B and type A network, few type C and few type D. This is not surprising since measures involving unweighted ties are easier to calculate and it is simpler to encode and visualize dichotomous ties, whereas weighted ties need more complex formulas. Moreover, directed ties are required if one wants to talk about flows of something, such as flows of knowledge." Coulon suggests that "when case studies are not able to capture the degree of complexity of the causal mechanisms under investigation because of the large number and diversity of the actors involved, (…) it is preferable to use a combination of case study and network analysis. It is possible that in the narrative giving a deep socio-historical understanding of the inner forces within the actors or nodes under the study the researcher misses some important relations/ties between actors. In combination with network analysis and other sources of data, it is possible that these ties could be detected much more easily, especially in large-scale networks".

Table 1. Type of network studied in innovation SNA research based upon the categorization of ties (with number of articles in italics)

	Undirected ties	Directed ties
Unweighted ties	Type A (*8*)	Type B (*15*)
Weighted ties	Type C (*3*)	Type D (*4*)

(Coulon, 2005)

2.3 Interests of the SNA approach for research on quality standard adoption

As shown in the literature review, the SNA approach applied to the study of innovation has many interests, especially when it deals with network structure and actor's behavior. Innovation is a very complex and multifaceted phenomenon, involving different sets of actors, different flows of information and knowledge. SNA can deal with such phenomenon, as shown in its use in innovation research during the last decade (Cross et al. 2003).

The interests of SNA in innovation research can be summarized in a few points. First of all, SNA allows the simultaneous combination of several types of ties directly or indirectly linked to the innovation processes (flows of information, money, knowledge etc). Secondly, SNA adopts a multi level perspective of actors (nodes) in networks (i.e. personal/organizational nodes), and connect these different levels of analysis through the method of the "linked design" (Lazega et al., 2007). Each level is not seen in isolation but instead in terms of interactions between levels. A third interest is that, through computation and formal methods, the SNA approach will avoid too vague and imprecise comments. Instead it compares structural characteristics with formal methods (centrality, betweenness etc. are usually summarized by numbers or formal indicators) linked to the results of the innovation process (success, failure, adoption rate etc., notions that can also be measured by quantitative criteria).

As shown in several research works (see for instance Giuliani and Bell, 2004; Cantner and Graf, 2006; Chan and Liebovitz, 2006; Tsai, 2001) SNA could help identifying different types of "cognitive roles", i. e. specific roles of actors (individuals and/or organizations) in the innovation process: technological gatekeepers, strong mutual exchangers, weak mutual exchangers, external stars. These typologies are built through the main structural characteristics of networks, network positions, and power in networks.

In the research on innovation applied to quality standard adoption there are two supplementary points of major interests that can be investigated complementarily by SNA:
-the acquisition and development of new knowledge (for innovation): this can be done through internal and external resources. This is more a question for early adopters but this is an important point in understanding how food SMEs innovate, where does it happen and why does an innovation start etc. This is a complex issue, mainly because this is related to the question of knowledge (difficult to study) and to the transformation of knowledge in real innovations. The questions of innovation phases are of particular importance. But SNA is of particular interest for obvious reasons: the fact that knowledge flows, that mainly come from outside the firm, must be tracked and studied as part of an 'innovation ecosystem'. It is also necessary to identify the absorptive capacity of firms towards new knowledge, and thus identify nodes' attributes (Freeman, 2004).
-the diffusion of innovations, mainly between firms and individuals, reflects the fact that innovation learning is frequently done through mimetic behaviors. Firms, because of competitive pressure, will decide to innovate and to copy what is done on the market or by competitors. An important body of literature is about this question of mimetic behaviors or follower behaviors. It is an important driver of innovation for food SMEs. These adoptions are mainly done through different types of networking, and SNA can be very helpful in tracking these phenomena.

3 An analytical framework for the study of quality standard adoption

Following the literature review we will consider the basic components for the building of an analytical framework: the phases (3-1), and the diversity of partners and partners' characteristics (3-2). Then these basic components are combined through an analytical framework, in order to identify the characteristics of the innovation process as well as the SME position in a network perspective, and their possible consequences for the adoption of food quality standards (3-3).

3.1 The phases in adoption of quality standards: their content and consequences for a network approach

The adoption of quality standards encompasses different functions, from creation to wide diffusion across firms. While following an ego-network approach, it is nevertheless necessary to identify what are these main functions. The specific situation of a company will then be related to these general functions, and more importantly, to the type of partner(s) that is (are) involved.

According to the literature in food quality management (Henson and Humphrey, 2009) there are five different phases that can be distinguished:
-the standard-setting: in other word this is the phase of creation of the standard, where the rules, definitions, procedures are formulated and written down.
-the adoption per se: an entity decides to adopt a standard, usually a firm. This decision is of course the central and discriminating phase of the process, even if this phase is short in time, with a wide diversity of contrasted situations.
-implementation: the rule is practically implemented in one company, with the development of new competences and creation/adaptation of (new) resources. This phase is usually identified as the operational phase and could last several years in case of complex standards that will necessitate important changes.

-conformity assessment: this is the phase that will bring compliance with the standards, the respect of procedures, rules, and lists of specification. The conformity can be assessed by many means, and from a network perspective this is important to acknowledge the extreme diversity of organizational configurations. Usually there are two broad means of assessing conformity self-assessment and by a third party. But inside these two categories the roles, statutes and functions may differ.
-enforcement: this phase will define the means and procedures that allow the execution of engagement, either through sanctions or through incentives. The enforcement phase can be implemented by the firm itself but also other organizations, specialized or not in this role. The State can also be an enforcer for mandatory rules.
While considering simultaneously these five functions and the main categories of food standards, it appears that the distinction between public and private on the one hand, and mandatory and voluntary on the other hand, becomes clearer. This distinction must be emphasized because of its implication for a network approach of food standard adoption.

3.2 The diversity of partners and relationships (nodes and ties): characteristics and identify-cation

As we have seen above, along with the diversity of functions comes the diversity and heterogeneity of partners involved. This heterogeneity is mainly linked to the complexity of the innovation process at stake when the adoption is not based on a short term innovation such as market innovation or when partners are mainly homogeneous entities (such as research centers) as in product innovation. For the adoption of quality standard, the innovation process is (or can be) both long in time and conducted with diverse entities. In parallel with this diversity, the content of ties can cover the complete spectrum of possibilities: money and information exchanges, knowledge transfers, social interactions and social exchanges.

3.3 Analytical framework: crossing phases of innovation and network effects

In considering the two components, we propose the following table 2. For each innovation phases that have been identified the network characteristics of the process are detailed, in terms of focal entity, network partners (i. e. nodes) and network relationships (i. e. ties).

Table 2. Phases of innovation in standard adoption: characteristics in a network approach

Phases in standard adoption	Characteristics of the phases of innovation in a network perspective			
	Content and network implications	Focal entity	Network partners	Type of exchanges and/or interactions
•Standard setting •Adoption stricto sensu •Implementation •Conformity assessment •Enforcement	*Roles of the phases in the adoption of the quality standard*	*Major entity(ies) involved in the process, at both organizational and individual levels.*	*All partners that have been in relation with the focal entity(ies), whatever their roles*	*Nature of exchange in SNA typology: levels of actions, contents, recurrence, embeddedness and coupling effects etc.*

4 A case study of a SME adopting a quality standard: Paris Caramel and ISO 22000 standard

The analytical framework is applied to a French food SMEs in following the general principles of the case study research (4-1). Then a synthetic presentation of the company and of the context is done (4-2). A final part develops the network analysis according to our framework, in considering the network effects, in the innovation process, of the two levels: individuals and organizations (4-3).

4.1 Methodology: case study approach and research protocol

The methodology is developed is the spirit of Yin's (2003) case study approach. Following Yin, the selection of the case study is done with an objective of an analytic generalization. This approach of analytic generalization is relevant when "a previously developed theory is used as a template with which to compare the empirical result of the study".

The research protocol in such approach is based on interviews, which is according to Eisenhardt and Graebner (2007) a rich source of information well adapted when the phenomenon is complex or unknown. Thus several face-to-face interviews with quality management services, CEO and consultants have been conducted. This information has been completed by secondary data about the environment, the quality procedures and the market characteristics relevant to the case study.

4.2 The case study: Paris Caramel and ISO 22000 standard

-Paris Caramel: short description and context of adoption

Founded in 1957, Paris Caramel is a food SME in the Picardie region in Northern France which belongs to the chocolate and confectionery industry. The company manufactures three main types of products of the highest quality: caramel, fruit pulp and chocolate, for a turnover of 900 000 Euros a year. The customers are pastry confectioners, delicatessen and shops selling local products. The company has forty employees, mainly makers of caramels, fruit jellies and chocolate candies. In year 2000, the company decided to develop the certification of various stages of the production process, started with HACCP. As a small family-owned company with mostly self-educated staff, Paris Caramel is very cost-efficient with a short decision process. Another important characteristic of the company is its human dimension: human capital is more important than financial returns, and the managers put more emphasis on training their employees and on maintaining employment than on profits.

In spring 2007, the Chamber of Commerce and Industry (CCI) decided to launch, for ten regional companies including Paris Caramel organized in an informal ISO 22000 club, a regional program to support ISO 22000 standards. Indeed the company management decided to embark on the process of certification because of new customers' requirements and changes in the business environment. The certification was not an absolute necessity for this healthy company but appears as a possible supplementary marketing asset in accordance with the policy of sustainable customer satisfaction ensuring the safety of products sold. It would also eliminate the different and heterogeneous customers' specifications and create differentiation towards competitors. The certification also facilitates the implementation of a structured approach that involves all the staff in a process of continuous improvement.

This ISO 22000 program has consisted in a business leader coaching along with accompanying collective actions for all participating companies. Finally Paris Caramel got the certification for ISO 22000 standard in October 2008.

-ISO 22000 standard: origin, content, objectives.

ISO and its member countries used the quality management system approach and tailored it to apply to food safety requirements, incorporating the widely used and proven HACCP principles into the quality management system (hereafter QMS). The resulting standard is ISO 22000. In September 2005, the standard was officially launched. Thanks to this new standard, HACCP and ISO 9001 are combined in an integrative manner, from upstream to midstream and downstream activities.

ISO standard 22000-2005 specifies the requirements for food safety management system when an organization in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. It is applicable to all organizations, regardless of size, which are involved in any aspect of the food chain and want to implement systems that consistently provide safe products. The means of meeting the requirements can be accomplished through the use of internal and/or external resources.

More specifically, ISO 22000 standard has the following objectives: to plan, operate, maintain QMS; to demonstrate compliance with requirements; to evaluate and assess customer requirements; to communicate food safety issues to the relevant interested parties; to demonstrate such conformity and to seek certification.

4.3 Application - -Global configuration of nodes and ties in the innovation process

The global configuration of network nodes and ties is summarized in table 3. The table shows a well balanced distribution of ties, between the four categories of ties identified at two levels.

At that stage, it is only possible to delineate and identify, in a static manner, the network dimension. In order to clearly disentangle the real network effects, it is necessary to introduce the time dimension.

-Analysis of the process of quality standard adoption.

The network configuration in the process of quality standard adoption must consider two steps simultaneously (cf. table 4 and 5 for a synthesis): firstly the identification of partners at organizational and personal levels; secondly their roles in relation with the innovation phases.

-Identification of organizations and individuals:

✓Organizations

Organizations involved in the process of standard adoption are: AFNOR, CCI, consultancy firms, other SMEs.

-AFNOR, the French ISO affiliated organization, has a central role in the definition of ISO 22000 standards. But this role can be qualified as highly differentiated, according to the phase of innovation. In the initial phase of creation, AFNOR has a leading role, but it is interesting to notice that Paris Caramel is not involved at all. In the phase of initiation, AFNOR has played a more contrasted role: thanks to its leadership and size, AFNOR always plays a central role in awareness of companies. But its actions are mainly oriented towards large companies. In the adoption phase AFNOR has no specific role. During the implementation phase, AFNOR provides its expertise and acts as a training entity both for companies and for consultants.

Table 3. Network configuration in quality standard adoption cross-classified by type of ties and types of entities involvedin Paris Caramel case study

Type of ties		Via organizations	Via individuals
Continuous	Similarities	✓Location in the Picardie region ✓Joint membership in HACCP club	✓Antecedents of contacts with business leaders ✓Comparison with other food business leaders
	Relations	✓Competition and rivalry with other food SMEs ✓Mutual commitment in associations	✓Informal exchanges with other managers ✓Informal relationships with professionals about quality management
Discrete	Interactions	✓Interactions with consultancy firms ✓Commercial relations with customers	✓Interactions with consultants ✓Personal interactions with buyers ✓Personal interactions with public bodies
	Flows	✓Knowledge transfer from AFNOR ✓Money transfer from CCI	✓Flow of information from competitors ✓Flow of information from the environment

-The CCI (Chamber of Commerce and Industry) had no role in the definition phase. Its action is crucial in the adoption phase: the organization has acted as a pivotal organization between AFNOR, consultancy firms and SMEs, through the program funding.
-Consultancy firms: Protechnic, a consulting firm had a central role in the adoption stricto sensu phase. It is difficult to separate its role as a company and as a person. Indeed the manager of the company has been largely convinced by the consultant to adopt the standard. But the company has also a very good experience and reputation at working with SMEs. The specific expertise is at the basis of the interaction process.
-ISO 22000 club for SMEs: this club is the heir of another previous club devoted to HACCP. Its role has been to connect companies from different industries (thus not in competition) to exchange views and questions about the standard and its consequences. Its role is both formal (membership) and informal (interpersonal relations, cf. infra).
-Third party certifier: the certification body Veritas has conducted the certification process and has been the main player, with Paris Caramel, during the conformity assessment phase.
✓ Individuals
The roles held by individuals are more difficult to acknowledge. Informal contacts and exchanges may occur at any time and for confidentiality and privacy reasons interviewees are reluctant to answer. Nevertheless interpersonal contacts between Mr. and Ms C. from Paris Caramel seem to play an important role especially with one consultant Ms N. and with all the managers from the ISO 22000 group.
-Consultant: Ms N., through its experience, played mainly a role of coaching. Ms N. put in evidence the interest of a certification and convinced the managers: the standard will improve the customer satisfaction and will enhance the customer confidence with better food safety conformity.
-SME managers within the ISO 22000 club: 10 managers from different companies seem to have played a crucial role in exchange and in creating a mutual emulation between the business leaders.

Table 4. Innovation phases and network effects in standard adoption for the Paris Caramel case study: (1) organizations

Innovation phases in food standard adoption	Characteristics of innovation phases			
	Content	Focal entity(ies)	Network partners (for Paris Caramel)	Type of exchanges and/or interactions
Standard setting	Definition of ISO 22000	-AFNOR	-None	-None
Adoption stricto sensu	Decision to adopt the standard	-Paris Caramel	-Customers -Personal antecedents (experience)	-Interaction -Awareness -Information transfer
Implementation	Acquisition of resources and competences, definition of procedures etc.	-Paris Caramel	-CCI -Consultancy firms -AFNOR	-Money -Knowledge transfer -Interactions
Conformity assessment	Verification of the compliance with rules and procedures for ISO 22000	-Paris Caramel -Certification body	-Consultancy firms -Veritas	-Knowledge transfer
Enforcement	Set up of means and systems (incentives, motivations, controls) in order to insure the maintenance in the long run	-Paris Caramel	-Consultancy firms, customers	-Knowledge transfer -Interactions

Table 5. Innovation phases and network effects in standard adoption for the Paris Caramel case study: (2) individuals

Innovation phases in food standards	Characteristics of innovation phases			
	Content	Focal entity(ies)	Network partners for Paris Caramel	Type of exchanges and/or interactions
Standard setting	Definition of ISO 22000	-ISO committee members	-None	-None
Adoption stricto sensu	Decision to adopt the standard	-Mr C.	-Personal experience of Ms C.	-Social interactions -Awareness
Implementation	Acquisition of resources and competences, definition of procedures etc.	-Ms C. -Ms M.	-Ms L. -Ms N.	-Training program -Personal advice
Conformity assessment	Verification of the compliance with rules and procedures for ISO 22000 standard	-Ms C.	-Mr C.	-Personal contacts -Social interactions
Enforcement	Set up of means and systems (incentives, motivations, controls) in order to insure the maintenance in the long run	-Mr C. and Ms C.	-Mr B.	-Personal contacts -Social interactions

5 Discussion and concluding comments

The objective of the communication is twofold: (i) to propose an original framework for the analysis of one type of organizational innovation, i. e. ISO 22000 standard adoption; (ii) to apply the framework to a specific food SME. Our research is mainly exploratory: it gives the main interests of the network perspective when studying the quality standard adoption. The major interest is the fact that the process of adopting a quality standard is heavily related to its organizational and individual context. Quality standards are immaterial in nature and highly complex to implement: food SMEs and their managers will inevitably rely upon their partners, stakeholders, institutional environment to adopt it.

Preliminary results, still to be confirmed and extended, could have interesting managerial implications for food SMEs. First of all, the collective (network) dimension of the process is shown. No food SMEs could have decided in isolation to set up ISO 22000 standards. The process is doubly collective: at the institutional level, where institutions (Chamber of Commerce and Industry), consultancy firms and AFNOR have worked together to promote the initiative; at a more micro analytic level, with each SME (including Paris Caramel) as a part of a community of business leaders with its own dynamics, objectives and social interaction mechanisms.

A second idea is that of resources. The critical success factor, in the quality standard adoption in Paris Caramel, seems not to be financial resources, but instead cognitive resources, i.e. the ability to connect and to be connected through network relationships to the relevant people and organizations. Consequently an important managerial implication of the research, to be validated and extended to other situations, would be to enhance these

cognitive resources and to identify precisely their nature in relation with the needs of the different phases of innovation.

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