

Information Management as a value-enhancement tool in the small pelagic fish supply chain

ROBERTA SPADONI, MAURIZIO CANAVARI, ERIKA PIGNATTI*

Jel code: Q22, M31, D83

1. Introduction

The current dynamism and complexity of the competitive environment put on the foreground the strategic role of information and of business and supply chain information systems (Frazier et al, 2009; Cantone, 1992). In business organizations, information management allows to coordinate activities, to control product flows and operations, to interpret the external environment and to react to its changes (Engelseth et al. 2009). The importance of information has been acknowledged since a long time: Galbraith (1973, cited by Daft and Lengel, 1986) affirms that different forms of organization may be distinguished on the basis of the quantity of information required to reduce uncertainty in choices and to reach an acceptable level of performance. Then, it is fundamental to find decision rules, information sources and structural organizational models which allow a better understanding of the use of information and how they can reduce uncertainty and equivocality (Daft and Lengel, 1986) in order to achieve an acceptable level of performance (Lewin and Milton, 1986, cited by Daft and Lengel, 1986). Galbraith (1977, cited by Daft and Lengel,

Abstract

Taking into consideration the management of information into the "small pelagic fish chain", the analysis started from the hypothesis that in a dynamic and complex competitive scenario, the ability to manage the information flow allows the creation of value and competitive advantages for the companies and the whole system itself. The study focused on the results of the analysis of data collected during 8 in-depth interviews with operators of the fishery sector. Interviewees were asked to express an evaluation of their availability to get/provide specific information from/to their own clients and to give their opinion about problems connected with the different types of information taken into account.

The study returned the picture of a system that needs to mature, overcoming both the strong orientation towards individualism and the lack of trust in the other actors towards respecting common decisions. The adoption of common choices could help overtake the fear of harnessing the business, and transform the high potential of the system into visible results.

Keywords: Information Management, Small pelagic fish chain, classification information, qualitative analysis.

Résumé

Dans cet article, nous avons mené une analyse en nous appuyant sur la gestion de l'information relative à la filière des "petits pélagiques". Nous avons avancé l'hypothèse que, dans un scénario compétitif, dynamique et complexe, la capacité de gérer le flux d'informations permet de créer de la valeur et des avantages compétitifs pour les entreprises et le système global. L'étude a été centrée sur les résultats de l'analyse des données collectées pendant 8 entretiens avec des acteurs du secteur de la pêche. On a demandé aux interviewés d'exprimer une évaluation concernant leur capacité d'obtenir/de fournir des informations spécifiques à partir de/pour leur propre clientèle et de donner leur opinion sur des problèmes liés aux différents types d'information pris en compte. L'étude a permis de fournir l'image d'un système qui a besoin de se développer davantage et de dépasser une forte orientation vers l'individualisme et un manque de confiance envers les autres acteurs à propos du respect des décisions communes. L'adoption de choix communs pourrait contribuer à aller au-delà de la crainte d'exploiter la filière et d'obtenir des résultats visibles en exploitant le potentiel considérable de ce système.

Mots-clés: Gestion de l'Information, filière des petits pélagiques, information classique, analyse qualitative.

1986) defines uncertainty as "the difference between the amount of information required to perform the task and the amount of information already possessed by the organization". Uncertainty is then due to a lack of information and determines the difficulty to answer explicit questions. Equivocality, instead, arises when available information generates multiple and conflicting interpretations. Equivocality is then related to confusion and loss of understanding and agreement in a team, and it has the effect to cause difficulty in the decision-making process.

Information management, besides being a strategic tool in business management, plays a fundamental role in shaping the market channel relationships: it may give priority to collaboration rather than incentivizing individualism and opportunistic behavior (Monczka et al., 1998; Feldmann and Müller, 2003; Choi et

al., 2008a and 2008b). In addition, transferring and sharing key information among the parties is the starting point towards overcoming cultural distance and differences among the supply chain members (Singh, 1996). In the analysis of supply chain relationships, moving from the transaction perspective to the relationship perspective requires that a steadily increasing amount of information is managed (that is, collected, maintained and analysed); above all, protec-

* Department of Agricultural Economics and Engineering, Alma Mater Studiorum – University of Bologna.

tion of the information assets within the market channel is key (Blattberg et al., 1994). Through sharing, the information asset may increase in value instead of decreasing; therefore, this is a process that should necessarily involve many partners (Lugli and Ziliani, 2002) up to the final consumer. Effective management and transferral of information in the supply chain becomes a strategic issue that may generate a relevant competitive advantage over competing supply chains (Tompkins and Ang, 1999; Feldmann and Müller, 2003) and may heavily affect marketing strategic decisions. On the contrary, ineffective, insufficient or delayed information management may cause malfunctioning of the whole system (Mason-Jones and Towill, 1997) and may decrease customer satisfaction (Singh, 1996). Then, the need to possess suitable information to make choices and rationalize his/her own activity expressed by the different actors of the supply chain and by the final consumer, requires the search of tools which allow identification, choice, management and the communication of the necessary information (Lugli, 2002; Grandinetti, 1993). Obviously, to manage information requires resources; therefore business organizations must define the proper allocation of resources as well as make decisions on information coverage, consistence and type and on the tools to be used to manage them to support their operations/strategic decisions.

In this framework, the study aims to analyse the interest of a group of operators in the small pelagic fisheries industry towards sharing different types of information, considering the level of uncertainty and equivocality. This information may be useful to make informed decisions about the possible strategies to enhance value in small pelagic products. The analysis focuses on the fish sector due to its social and economic relevance for some Italian coastal areas, and because the features of the fish sector system point out the need for improvements in the organization of this supply chain and in the value-enhancement of its products on the market.

The remainder of the paper is organized as follows: Section two describes the methodological approach adopted and the way information has been collected. Section three provides an overview about different types of available information, describing their peculiarities and relevance according to their impact on relationships in the supply chain. Section four focuses on the management of information in the fish sector in Italy, shows data and results collected by direct interviews and finally summarizes the main findings, providing some hints for further research and approaches.

2. Materials and methods

The methodological phases of this study are the following:

1. A literature review has been conducted to define the type of information that is managed or may be relevant in the fisheries supply chain, considering also the aspects which affect their management. Some institutional policy reports and documents, both at national and EU levels, have been considered as well;

2. A suitable analysis method has been defined. The “opportunity mapping” (Lugli and Ziliani, 2002) and the “uncertainty/equivocality matrix” (Daft and Lengel, 1986) methods have been chosen in order to define a simple analysis framework and to ensure an easy-to-communicate representation of findings;
3. A proper data collection instrument has been developed;
4. Data has been collected through direct in-depth interviews, administered in-person to 8 practitioners directly involved in the fisheries industry. During the interviews, aimed at exploring several aspects of business management conduct and operations, the interviewer also stimulated a discussion about information management and about the respondent’s attitudes about sharing information (that is, both receiving and releasing information with customers and suppliers). In addition, problems and opportunities linked to the type and amount of information to be dealt with have been explored. Along side this qualitative information an evaluation of attitudes towards sharing information of different types has been collected;
5. Information and responses have been processed, discussed and validated with industry operators;
6. The key elements useful in informing the possible future value-enhancement initiatives have been identified.

In the first step, a careful search and review of scientific contributions to information management as a strategic organizational asset for firms and supply chains has been performed. Information about the small pelagic industry and its organization, as well as on the initiatives undertaken by industry associations and institutions regarding information management at the supply chain level have also been collected. Finally, governmental pre-requisites and indications about communication, competitiveness and value-enhancement policies in the fisheries industry have been examined. The different types of information to be considered were defined and the factors that affect uncertainty and equivocality were highlighted.

In the second step we identify two conceptual models as a framework for the analysis:

- In the first one, the interest/availability to share information (i.e., receiving and releasing information) from or to the customers and the suppliers is considered (Lugli and Ziliani, 2002);
- In the second one, the quality of information and its degree of uncertainty/equivocality are highlighted, as well as the influence they may have on interest for information and efficiency of information management (Daft and Lengel, 1986).

Data collection was performed using an *ad-hoc* instrument, administered to the interviewees in the form of an extremely concise questionnaire, consisting in just two sections. The first one dealt with the level of interest to receive from suppliers and availability to provide to customers information classified by 5 type categories. The measurement was made using a semantic scale ranging from 1 (no inter-

est/availability) to 7 (maximum interest/availability). The second one was focused on the evaluation of information quality, asking the respondent to express his/her opinion about uncertainty/equivocality, measured using a semantic scale ranging from 1 (worst quality) to 7 (best quality).

The field work was performed between October 2010 and July 2011. Eight fishery industry practitioners have been interviewed: 3 of them were members of Producers' Organizations according to the EU Regulation 104/2000, 2 fish market managers and 3 processors, geographically distributed along Italy's Adriatic Sea coast (3 in northern Italy, 3 in central Italy and 2 in southern Italy). Data has been analysed using basic statistics (mean and standard deviation) and simple bi-dimensional graphical tools and the analysis was complemented with the qualitative judgments expressed by the interviewees. Findings and conclusions have been validated within the research team and during meetings with industry operators.

3. Types of information

In any business organization and business environment, managers need to identify, select, and manage the needed information, as well as decide what information he/she can disclose or share with partners and competitors. The chosen policy is based on internal factors, such as the organization's mission, as well as structural, technological, financial constraints, the type of operators involved and on their reciprocal links, considering the absence or presence of more or less advanced forms of coordination or a stronger or weaker level of competition and finally the macro-environment conditions, such as legal framework and macro-economic variables.

Information can be classified using different classification methods and categories (see, for instance, Daft and Lengel, 1986; Frazier et al, 2009).

In this study, information is classified on the basis of its use and linked to the type of data provided (Canavari et al, 2010). The **types of information** we selected are specified as follows:

Information on Hygiene and Safety	HS	They are requested and managed for several reasons: to comply with regulations, to prevent problems related to safety hazards and to show a high level of performance and care on a key element of quality in customers' eye. Often they are communicated to consumers through product labels. Depth and meaning of this type of information is varying according to whether the organization is just willing to comply with the mandatory standards or it chooses to voluntarily apply more stringent rules.
Information on ethics, social and environmental issues	ESE	They are mainly linked to the company's image, rather than to products/services. Companies that are willing to show a conduct aimed at pursuing not just private but also public benefits and sustainability as a business philosophy are interested in this type of information. Usually, the reference model is contained in a specific voluntary standard (for instance, SA 8000, EMAS and ISO 14001 standards);
Information on quality characteristics	QUAL	This is by far the category potentially containing the most heterogeneous and complex mix of data. Therefore, it would require that the company and/or the practice in the supply chain clearly defined what is understood as "quality" and the preferred ways to deliver and to signal it. On the contrary, quite often definitions of quality are ambiguous, and are accompanied by a lack of exact and formal specifications found usually by the incorrect use of terms, and by the lack of transparency. This often implies that the quality delivered does not correspond to the customer's expected quality. This category contains, amongst many others, information about sensory characteristics of the product, nutritional values, production methods and practices, origin, typicality and uniqueness of the product.
Core strategic information	CORE	This category collects a set of information managed and delivered in order to highlight, strengthen and communicate the organisation's mission and values. They are fundamental to describing the company and they are usually consistent within the industry and the supply chain.
Value-adding strategic information	VALUE	This information is crucial to increase the value of products and services supplied to customers and to assign a competitive advantage to the company/supply chain. It is part of an augmented set of information, additional to the core ones, and is able to differentiate products/services, companies and supply chains within the industry.

Enterprises as well as supply chains would see the importance of one or more types of information to prevail according to a set of conditions, such as: the context in which it operates, the level of data quality necessary, the frequen-

cy of data transfer required, the resources needed for the identification of information needs and for their transfer among the different operators (formal procedures to be used and the absence or presence of common standards).

Therefore, a deep knowledge of the business organization, the existing ties with other actors in the supply chain and the characteristics of the market of reference is fundamental to

set up a proper management system for such information. The aspects which mostly influence information management may be summarized as follows (Canavari et al, 2010):

Structural and technological constraints	According to business type, the need to use technology is very different and specific, different and specific being the internal and external needs of the firm. The technological and structural constraints are in close connection with limits linked to available financial resources, technological investments, but also information acquisition on suitable and available technologies, representing a cost for the enterprise.
Legal framework constraints	Most of the information managed by the firms is necessarily collected because of the need to comply with the laws; organizations at every tier in the supply chain must comply with both vertical (sector-specific) and horizontal (industry-wide) pre-requisites, which may orientate and limit their activity. It can happen that the normative constraints clash with the enterprises' operations management, thus sometimes producing consequential ineffectiveness deriving from binding norms that are hardly applicable in reality or are interpretable in a non-univocal way.
Company strategy	The use and transfer of certain information is tightly tied to the image and the mission that enterprises assign to themselves to orienting their own activities. Presumably exchange of different information with suppliers from those enterprises who want to differentiate themselves on the basis of product quality and link with traditions and the territory. Information will have different characteristics, functional to the type of message that each enterprise wants to communicate the target customers.
Human resources	Competences and skills of human resources are fundamental elements to achieving satisfactory performance. Also in the management of information the role of human resources is strategic.
Type of relationship amongst firms	The presence of forms of integration, their complexity and the business predisposition towards the creation of stable relationships with other subjects, may notably influence the possibility of retrieval and management of information. Together with enterprises that are available to a systematic information interchange and to the possibility to make them "visible" in the market, there are many others which consider information management and control of their diffusion a key asset of their activity and are, therefore, unavailable to disclose most of the information (Frazier et al, 2009).

The factors described above influence the characteristics of information and its degree of uncertainty/equivocality. The classification by type of information and the elements that may affect their identification and management have been used in the empirical analysis on information management in the fisheries industry, focusing on the small pelagic fish capture and processing in Italy's Adriatic coast, as described in the following sections.

4. Information in the fish sector

Moving from the main features of the fish chain (ISMEA, 2007; ISMEA, 2010; <http://old.politicheagricole.it/PescaAcquacoltura/PesceAzzurro/default>), initiatives and projects aiming at managing information and communication in the fish sector have been analysed. Some initiatives were found, put into practice by single companies or consortia/associations supplying different kinds of information concerning, for example, product quality, production methods, ways to prepare fish, actions for value-enhancement such as certifications and organisation of events and promotion (Gregori and Zoratti, 2000). Projects and publications regarding information on products' traceability and safety seem to prevail (e.g. "Fish chain" project¹; TRA.CE project²; Segale et al, 2000; Sibani, 2008; ASPeA, 2011).

Authors recognise that it is quite difficult to carry out a comprehensive analysis on the wide variety of information types manageable in the fish chain, considering also the high specificity of the single contexts. Therefore, to fulfil the objective of the research, the authors decided to provide

¹ Project "Implementation and certification of a supply chain traceability system for high quality fish products". It is a national project involving 10 Organizations of producers (P.O.) from 4 Italian regions (Friuli Venezia Giulia, Veneto, Emilia Romagna, Marche), co-funded by the European Regulation (EC) 2792/99, art. 15, par. 2 "Measures of collective interest" <http://filieraittica.it>.

² Project funded on the Public Announcement n° 359 published on September 21, 2009 to perform initiatives aiming at enhancing knowledge, dissemination and value of the fish sector. SICILIAN REGION – REGIONAL DEPARTMENT FOR AGRICULTURAL AND FOOD RESOURCES – Department for interventions on fishery-<http://tracelands.wordpress.com>.

only some indications about institutional initiatives concerning communication.

Some communication plans prepared by National public authorities have been checked³. In particular, some elements of the above mentioned plans were highlighted, which can be useful for the management of information in the “small pelagic fish system”:

- Strong influence of environmental issues on the choices to be undertaken;
- Relevance of continuation in initiatives, in order to make investments effective;
- Scarceness of resources as main constraint;
- Relevance of citizens and consumers’ information and education (especially for children and adolescents who still attend school);

- To increase the amount of information on less marketed fish species and promoting their consumption;
- To focus on information concerning entrepreneurial activities, such as commercialisation and tasting, or other complementary activities, like recreational fishery or fishing tourism;
- To support products’ value-enhancement (quality, freshness, sustainable fishery);
- To support the image of the sector (highlighting the relevance of the coordination between operators and with public/private authorities/bodies);
- To invest in national or local television programs (an “agreement” with the national television station – RAI – is on place, regarding programs that focus on topics connected with agriculture or specific for the “sea” topic).

Table 1 - Synthesis of the communication initiatives promoted by MIPAAF (Italian Ministry of Agricultural, Food and Forestry Policies (2010-2011)).

INITIATIVES	ADDRESSEE(S)	OBJECTIVES	NOTES
Radio and TV co-productions	Citizens	To improve the image of the sector. To highlight the quality of the products and the economic and environmental sustainability.	Initiatives carried on together with the agricultural sector.
Information campaigns at school	Citizens and consumers	Involvement in order to highlight the sea resources and the world of fishery	“Marinando” and “Vivere il mare”
Organisation and participation to fairs and events	Consumers and entrepreneurs	To inform	Identification of events
Actions for sales points and catering businesses	Consumers and entrepreneurs	To stimulate and diversify a more conscious consumption To provide information aiming at making young people approach fishery jobs	Popular and informative publications handed out where demand and supply of aquaculture and fishery products meet Recipes Guide Edition Photograph contest
Cultural initiatives (using one’s own resources or benefitting from funds)	Citizens and consumers		
Editorial initiatives	Consumers	To disseminate news	Agreements with information bodies
Awareness campaign (illegal fishery, game fishing)	Operators	To inform on illegal fishery To perform the census of game fishing	
Consumption of protected species	Consumers	To inform on the illegality of consumption of protected species	Together with the Italian Touring Club

Source: authors’ elaboration on documents by the Italian Ministry of Agricultural, Food and Forestry Policies.

In order to understand which information and communication actions can be undertaken for the small pelagic fish chain, in Table 1 an overview of all the initiatives of communication and information included in the institutional plans is presented.

From the preliminary analysis performed, some general considerations can be gathered which can support indications coming from the direct interviews of the small pelagic fish sector. First of all, it appears that any proposal for activities, even by private subjects, faces the problem of the real availability of resources and of accessing funds; the broad and unspecific character of the provided indications limits the possibility to design effective communication plans

³ Italian Decree of 9 April 2010 on Gazzetta Ufficiale (Official Journal) n. 105 of 7 May 2010 «Approval for the year 2010 of the communication plan for the organization of information and communication initiatives aiming both at promoting a right image of fishery and aquaculture sector, and at making people aware of the characteristics and the qualities of national fish products»; Italian Decree n. 5368 of 16 March 2011 on Gazzetta Ufficiale (Official

Journal) n. 111 of 14 May 2011 «Approval for the year 2011 of the communication plan for the organization of information and communication initiatives aiming both at promoting a right image of fishery and aquaculture sector, and at raising people’s awareness about characteristics and qualities of national fish products, and on all the other activities concerning fishery and aquaculture realized by the Italian Ministry of Agricultural, Food and Forestry Policies.

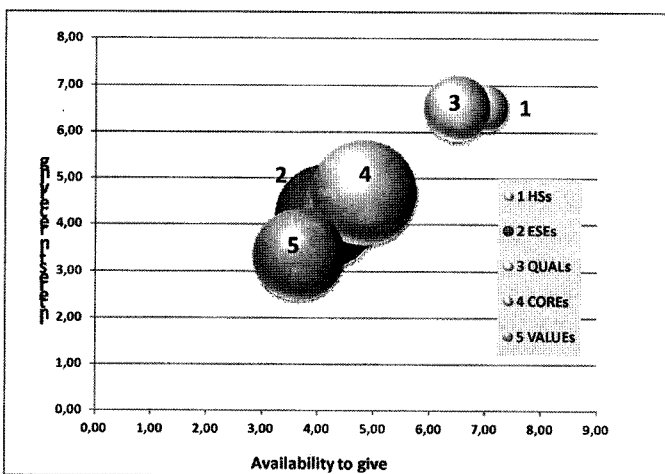
for fish and aquaculture sector, which is made up of extremely different production and territorial situations. It is also necessary to think about the chosen communication channels that must fit the targeted addressees.

4.1. Interviews with industry operators

The analysis of the data collected during the direct survey highlights some elements that can be used to complete the description of the “small pelagic fish system”.

Interviewees generally agreed in showing both a high interest in receiving information from suppliers⁴, and a certain availability in providing hygiene-sanitary-safety (HS) information and information concerning quality requirements (QUAL) to customers (figure 1 and 2). Moderated interest was shown towards strategic information related with companies’ peculiarities (CORE), and scarce attention was also expressed both against information connected with ethical, social and environmental issues (ESE) and “value-adding strategic information” (VALUE), related to specific customer’s requests. For the last mentioned information types (CORE, ESE, VALUE), operators’ evaluations are more heterogeneous and vary also according to the stage of the market in which companies do their business.

Figure 1 - Interest in receiving information by the supplier and availability to give information to the supplier⁵.



Source: authors’ elaborations.

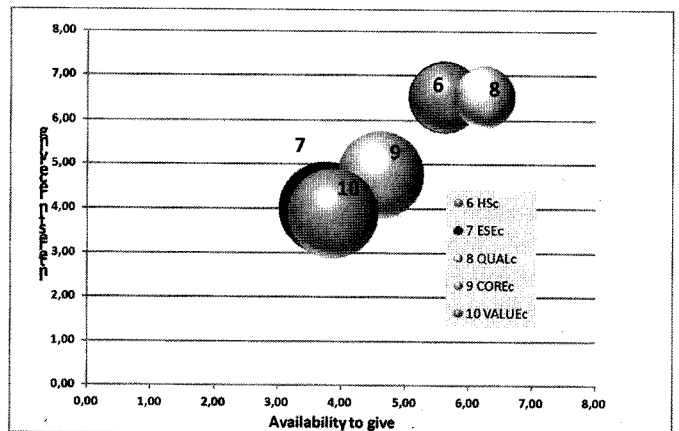
Focusing on interviewees’ evaluations⁶ about the degree of equivocality and uncertainty of the different types of information (figure 3 and 4), hygiene-sanitary-safety (HS) information is seen as firm, but with a certain degree of equivocality due to the possible different interpretation of regulation requirements.

⁴ Only 6 operators answered these questions, because they are involved in the upstream stages of the system.

⁵ The size of the spheres is an indication of scores dispersion. The size is proportional to a value determined by summing the standard deviations of both the availability to receive and the availability to provide information on each information type.

⁶ Only 5 operators (A,B,C,D,E) answered these questions

Figure 2 - Interest in receiving information by the customer and availability to give information to the customer⁵.



Source: authors’ elaborations.

Information concerning quality requirements is considered slightly ambiguous and uncertain due to the difficulty of defining the meaning of quality, but this can be explained by the fact that many quality requirements of products are defined by laws and/or production regulations. It is a bit more difficult to provide a correct interpretation for the other types of information, considering the high differentiation of interviewees’ answers.

Interviewees’ evaluations were discussed with the interviewees themselves and afterwards with the research groups, with the aim to define a clearer framework about opinions and perspectives for information management. The heterogeneity of opinions is clearly affected by the typology of managed products, by the market stage in which companies do their business, by the different fishing communities and then by the influence of the local context in which actors operate.

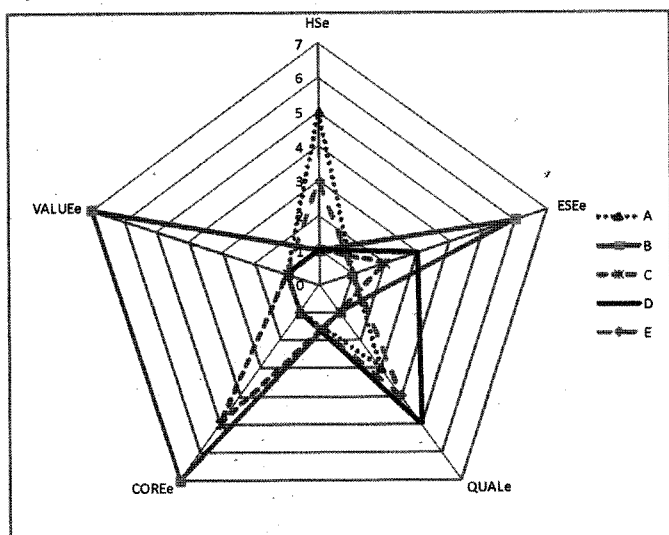
Interviewees expressed their difficulty in considering information management as a strategic tool for value-enhancement. In particular, some elements must be highlighted:

- Scarce interest by the production stage operators for ethics, environmental and social information (ESE);
- For what concerns information on hygiene and safety (HS), operators think that there are too many regulations, which are often interpreted in different ways or not communicated in the proper way;
- The use of strategic information (labels, brands, certifications, companies differentiation, etc.) is not effective;
- It is very difficult to transfer information on product quality to the consumers effectively.

Moreover, the lack of a common “vision” between operators acting in the same supply chain or belonging to different fishing communities is a constraint on the realisation of effective common initiatives oriented to the market.

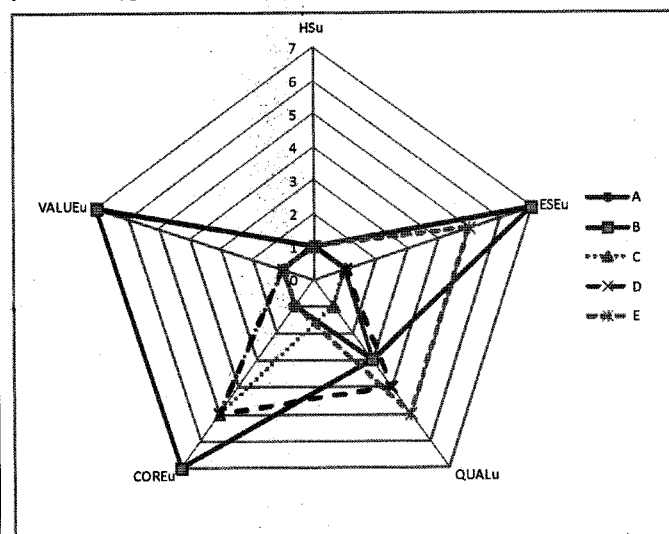
The study then returned the picture of a system that needs to mature, overcoming both the strong orientation towards actions individuality and the lack of trust in respecting com-

Figure 3 - Evaluation on the level of "equivocality" of the different information types.



Source: authors' elaborations.

Figure 4 - Evaluation on the level of "uncertainty" of the different information types.



Source: authors' elaborations.

4.2. Final remarks

The analysis of information management confirmed indications and considerations have emerged from the results of previous national and local studies on the sector, and of specific lines of research. It is evident, indeed, that in an evolving scenario (implementation of sector specific policies, change of the market, problems of the production system, etc.) the "small pelagic fish system" needs stronger coordination and longer-term common strategic vision.

Interviewees seemed to be almost exclusively interested in managing information connected with legal requirements; they also showed different opinions about the reasons which limit the creation of a system capable of effectively using the transfer of information.

In a scenario where fish chain and, in particular, small pelagic fish chain enterprises are asked to innovate their businesses by adopting more effective operational and organizational systems, an improved management and organisation of information must be coordinated and coherent with such changes and evolutions. The enhancement of information management and information issues is, in our opinion, linked to dependent on some critical factors, listed below:

- ∞ Higher availability in providing and disseminating data about enterprises' activities, both between enterprises operating in the same area or in different areas;
- ∞ Strengthened supply chain relationships, also achieved by sharing data and information;
- ∞ Higher knowledge and competences, leading to focus and specialisation, of those providing information services to the system;
- ∞ Availability of both financial and strategic support by local, national and European public institutions but also more resources invested by the private actors.

In this framework, it is necessary that the industry operators agree upon common strategies to implement joint actions, aimed at complying with the above mentioned conditions, for instance:

- ∞ Setting up targeted training (both technical and theoretical) for human resources responsible for finding and/or translating and/or using information at local, national and international level, both within and amongst enterprises and/or at the interface with public bodies;
- ∞ Investing resources in co-ordinated efforts to agree upon common standards regarding the type of information to be managed at the different levels of the supply chain;
- ∞ Jointly organising targeted events, under the direct responsibility of organisers for what aspects concern the use of financial and human resources.

These elements give the image of a context with high potential for improvement. The enhancement of the value of small pelagic fish is strongly dependent on the possibility to manage types of information that could be strategically more interesting for customers and/or consumers; the value-enhancement will also be possible by overtaking "terri-

mon decisions. Trust is well known as a facilitator for the coordination of material and information flows in food networks (Hofstede et al., 2010). Previous research actually identify information exchange as one of the basic antecedents to trust within hybrid structures typical of the agri-food system (Fioroni et al., 2009).

The adoption of common choices, respecting all the different approaches along the chain (territorial, historical, socio-economic influences; operators' education and mentality), could help in overtaking the fear of harnessing the business and transforming the high potentiality of the system, which stems from the offer of a "good" product and from operators' skills and professionalism.

torial" divisions with the aim to adopt common decisions and by coordinating coherent and effective promotion and communication initiatives.

References

- ASPeA (2011), Manuale per la vendita diretta del pescato, Ancona, 42 pagg.
- Blattberg R.C. Glazer R., Little J.D. (1994), *The Marketing Information Revolution*, Harvard Business School Press, Cambridge, MA.
- Cantone L. (1992), Il sistema di marketing informativo di marketing di filiera, *Collana di studi aziendali e di marketing*, IV serie, CEDAM, Padova, 74 pagg.
- Canavari M., Centonze R., Hingley M., Spadoni R. (2010), Traceability as a part of competitive strategy in the fruit supply chain, *British Food Journal*, vol. 112(2), 171 – 186.
- Choi, T.-M., Li, D., Yan, H. (2008a), Mean-variance analysis of a single supplier and retailer supply chain under a returns policy, *European Journal of Operational Research*, 184(1), 356-376.
- Choi, T.-M., Li, D., Yan, H., Chiu, C.-H. (2008b), Channel coordination in supply chains with agents having mean-variance objectives, *OMEGA - The International Journal of Management Science*, 36(4), 565-576.
- Daft R., Lengel R. (1986), Organizational Information Requirements, media richness and structural design, *Management Science*, vol.32, n. 5, 554-571.
- Engelseth P., Takeno T., Alm K. (2009), Food Safety, Quality and Ethics in Supply Chains: A Case Study of Informing in International Fish Distribution, in Lindgreen A., Hingley M., Vanhamme J. (edited by) *The Crisis of Food Brands*, Gower, 45-63
- Feldmann, M., Müller, S. (2003), An incentive scheme for true information providing in supply chains, *OMEGA* 31(2), 63-73.
- Fioroni, A. R., Rossetti, E., Martino, G. (2009). Fiducia e contratto nelle relazioni tra imprese agro-alimentari: elementi teorici ed evidenza empirica. *Economia agro-alimentare*, XI(3), 29-51.
- Frazier G.L. Maltz, E., Antia, K.D., Rindfleisch, A. (2009), Distributor Sharing of Strategic Information with Suppliers, *Journal of Marketing*, vol. 73, 31-43
- Galbraith J. (1973), *Designing Complex Organizations*, Addison-Wesley, Reading, Mass.
- Galbraith J. (1977), *Organization Design*, Addison-Wesley, Reading, Mass.
- Grandinetti R. (1993), *Reti di marketing*, ETASLIBRI, Milano, 183 pagg.
- Gregori M., Zoratti G. (2000), La comunicazione collettiva in Europa sui prodotti ittici, in Gregori M. (Edited by), *La comunicazione collettiva*, CLEUP, Padova, pagg. 255-293.
- Hofstede, G. J., Fritz, M., Canavari, M., Oosterkamp, E., van Sprundel, G.-J. (2010). Towards a cross-cultural typology of trust in B2B food trade. *British Food Journal*, 112(7), 671-687.
- ISMEA (2007), Indagine congiunturale presso gli operatori della filiera pesca e acquacoltura – I semestre 2006, Roma
- ISMEA (2010), Settore ittico in Italia – Check-up 2010, Roma
- Lewin A.Y., Milton J.W. (1986). Determining Organizational Effectiveness: Another Look, and an Agenda for Research, *Management Science*, 32, 514-539.
- Lugli G. (2002), Integrazione informativa di canale e creazione del valore di marketing, *Industria e distribuzione*, n. 1, 7-17.
- Lugli G., Ziliani C. (2002), Rivoluzione dell'informazione e stabilità dei rapporti di canale, *Micro e Macro marketing*, n. 3, 10-27.
- Mason-Jones, R., Towill, D.R. (1997), Information enrichment: designing the supply chain for competitive advantage, *Supply Chain Management*, 2(4), 137-148.
- Monczka, R.M., Petersen, K.J., Handfield, R.B., Ragatz, G.L. (1998), Success factors in strategic supplier alliances: the buying company perspective, *Decision Science*, 29(3), 553-577.
- Segale A., Finco A., Bertini C., Gagliardini Anibaldi L., Bolognini S., Pietrucci A., Delle Vergini A.R., Perozzi L. (2000), La qualità certificata nella filiera dei prodotti ittici, Aspea, Ancona, 182 pagg.
- Sibani M. (2008), La logistica nel settore ittico Alto Adriatico: criticità e prospettive di sviluppo, Osservatorio Socio Economico della Pesca dell'Alto Adriatico- Veneto agricoltura.
- Singh J. (1996), The importance of information flow within the supply chain, *Logistic Information Management*, 9(4), 28-30.
- Tompkins, J., Ang D. (1999), What are your greatest challenges related to supply chain performance measurement?, *IIE Solutions*, 31(6), 66.

Websites

- <http://old.politicheagricole.it/PescaAcquacoltura/PesceAzzurro/default>
- <http://filierraittica.it>
- <http://tracelands.wordpress.com>