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Information Process and Value Creation: an Experimental Study

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Abstract To process and draw value from their customer databases, firms set up information systems based on informational processes which make it possible to turn data into information and knowledge for action. Technical and cognitive knowledge is necessary but difficult to master, which leads some firms to opt for outsourcing. This research draws on the study of a supermarket retailer that engaged an IT services firm specializing in the study of large commercial databases to perform all aspects of management control related to its jewelry sales activity. A value chain for the inter-organizational information process was identified, showing the importance and fragility of the subprocess of knowledge transfer between the two entities.

Keywords Knowledge · Process · KMS · Value chain · Learning

Introduction

It is now accepted that value creation in a company is based not on tangible elements that can easily be appropriated by competitors but on intangible resources (OECD 2013): knowledge, corporate reputation (brand image), customer/supplier relations, and also the quality of the company's information processes all make it possible to construct distinctive skills that are a source of competitive advantage in the long-term.

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The quality of intra and inter-organizational informational processes are the inputs into the sensemaking process that transforms simple information into knowledge. For Spiegler (2003) and Bhatt (2001), data are raw facts, information is an organized set of data derived from the judgment of an individual or a group, and knowledge is meaningful information that makes it possible to act effectively in a given field.

Appropriate conversion of data into knowledge in an organization (or between two organizations) requires introduction of a knowledge management (KM) strategy.

The main problem facing a company engaged in such a strategy is making sure that the knowledge created by a team from one of the organization's departments or by individuals is reusable by other actors in other contexts, contributing to an overall improvement in performance. If information is to travel from one point to another in the organization (or between several organizations), the company cannot afford to ignore the need for reflection on the location of knowledge creation processes, the process of knowledge conversion depending on its nature (explicit or tacit), its level (individual or organizational), and ultimately on its final use.

The object of this research is to value creation generated by a company's information process, and it focuses on the following questions:

- Can we identify the different phases of the information process that turns operational data into knowledge that is applicable for management?
- Which activities or stages in the process contribute to value creation?
- Does a value chain exist in the information process?

These questions will be analyzed from a theoretical standpoint and illustrated by a study of an IT service company that specializes in processing commercial information. This company was engaged by a supermarket group to set up management control for jewelry kiosk-style sales outlets, using analysis of commercial data for all its national and international sales outlets. Through this study, we observe a process by which raw data is turned into strategic information for management of the client company (a supermarket retailer) and enhance the models used.

Part I: The Value Chain of the Inter-organizational Information Process

Consulting and professional service firms (particularly IT service companies) perform information-processing work based on information processes that turn raw data or facts into information, then into knowledge for action. These processes may be intra-organizational, creating links between the different departments of an organization, or inter-organizational, when the IT service company provides advice for a client company. In the second case, the information process is shared between the two entities.

An inter-organizational information process must enhance the value created between the two entities. This makes it relevant to highlight the value chain involved in the

information process, mainly by reference to traditional tools for analyzing value, such as the value chain model (Porter 1982).

The principal theoretical framework used to address the research question draws on several works of research, grouped into two major families:

– research focusing on knowledge creation underpinned by an inter-organizational information process (Argote et al. 2003; Van Wijk et al. 2008; Easterby-Smith et al. 2008)
– research that resituates the sources of value creation in a strategic perspective, to identify a value chain in the knowledge management process (Porter 1982; Woiceshyn and Falkenberg 2008)

The Information Process Value Chain

This section presents the theoretical framework used to represent the sequence of activities in a company and the sharing of value with partner companies.

Diagnosis of the Value of Activities and Their Interaction

Porter observes that "Every company is a collection of activities that are performed to design, produce, market, deliver and support its product. All these activities can be represented using a value chain" (Porter 1982).

Two groups of activities are involved in the value chain:

- Primary activities: activities that directly contribute to the physical production and sale of the product
- Support activities: activities that support the primary activities and form the infrastructure of the business

Value is the amount that customers are prepared to pay to obtain a product or service. It results from various activities performed by suppliers, the company, and the distribution circuits. A company's desired involvement in a value chain will depend on its strengths and weaknesses at each level of the chain: it will seek to specialize in activities for which it has a competitive advantage in terms of costs and/or differentiation and leave activities on which it is less competitive to other partners. Studying the value chain therefore consists of defining the fields of activities for which the company provides a competitive advantage, not forgetting to include the links between the different levels. In other words, a cost/value analysis is conducted to help the company decide whether to carry out activities in-house or outsource them. The value created is thus distributed between several departments of a company and several companies in a market segment. Organization and fragmentation of production takes place at world level and is caught up with the trend towards offshoring for some or all of the stages of the value chain. Krugman (2006) considers that the value chain's distribution throughout the world is one of the prevailing features of modern international business.

Inter-organizational Value Sharing

The company may thus decide not to handle internally all functions involved in designing, manufacturing, and marketing its product or service and instead to outsource certain functions in the value chain.

Outsourcing can take the form of simple subcontracting, in other words, hiring external partners to undertake certain activities. It can also give rise to more long-term cooperation in a varied range of areas.

After initially outsourcing activities such as maintenance, security, and catering, companies subsequently began to outsource invoicing, accounting, IT, purchasing, after-sales service, logistics, and, in the case studied here, management reporting and management control. In recent years, large groups' outsourcing strategies have led to growth in the service sector, with service providers capable of carrying out functions perceived by their clients as "non-fundamental" or non-strategic.

The decision to outsource is driven by considerations of cost (an activity is outsourced if outsourcing is cheaper than doing it in-house) and flexibility, essentially meaning that fixed costs become variable costs. The growth of these strategies has resulted in business networks born of economic changes (competition constraints), ideological changes (a less asset-based view of the company), strategic changes (refocusing), and technological changes (the role of ITCs used to monitor organizations remotely).

This raises the question of how the value creation process is rolled out within the organization and between different organizations.

Value chain-based analysis provides a relevant theoretical framework to represent the sequence of activities in a company and the sharing of value between several partner companies. We consider this framework well-suited to examination of value sharing between a professional service company specializing in information processing and a client company that receives advice and recommendations for its management control. The reports and advice received derive from analysis of the client's database. Reference to the two value chains identified and their overlaps will bring out the information-sharing zone that leads to creation of knowledge for the client company.

The theoretical framework used in this study can be presented schematically in Fig. 1.

The Inter-organizational Process and Knowledge Creation

The essential problem in many organizations is how to distribute knowledge to the departments that need it most and can apply the new knowledge in other management situations (Alavi and Leidner 2001; Pentland 1995). Business systems tend to be inefficient at locating and retrieving the knowledge they hold (Huber 1991).

Argote and Ingram (2000) define knowledge transfer as "the process through which one unit (e.g. group, department, or division) is affected by the experience of another." Knowledge transfer channels (Alavi and Leidner 2001) can be informal (impromptu meetings, during coffee breaks, etc.), with the risk of limited dissemination and distortion if the content of knowledge is not coded, or they can be formal (at conferences and training courses), in which case the problem is that they can inhibit the creativity of the members receiving the knowledge. Knowledge can be handed on

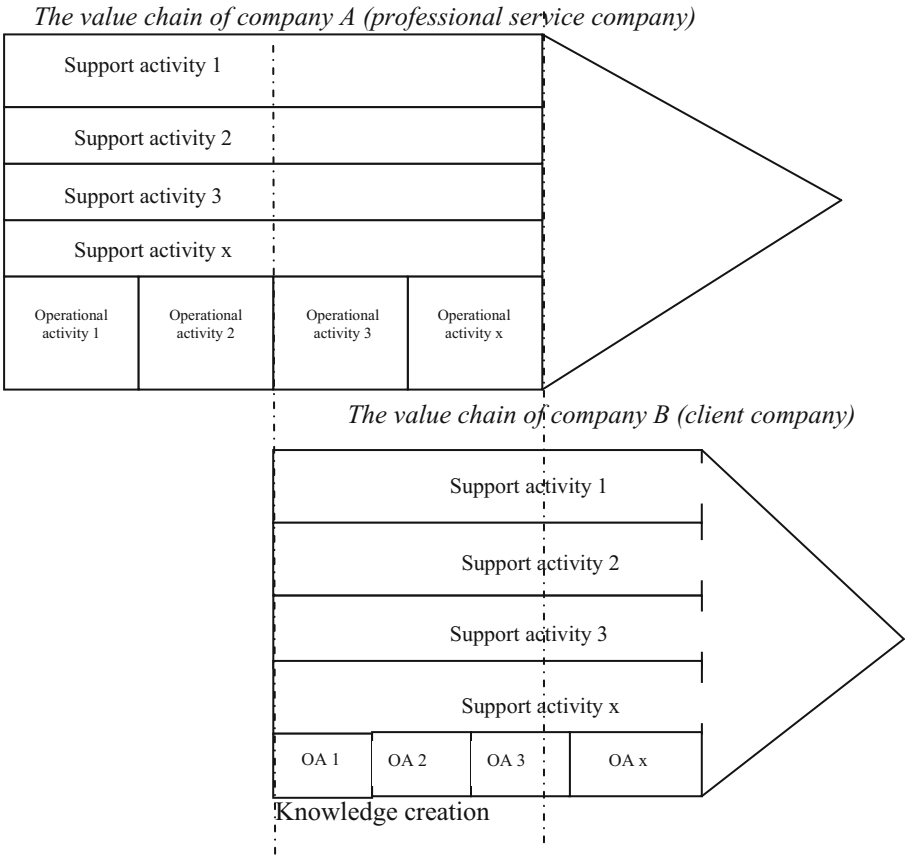

Fig. 1 The inter-organizational information process

person-to-person or transferred through impersonal channels. The transfer can take place at several levels, as noted by Alavi and Leidner (2001): from one individual to another, from an individual to a group, from one group to another, from a group to an entire organization, and finally between organizations.

The aim of this article is to highlight the knowledge creation underpinned by transfer/sharing of information between two organizations. After a brief reminder of Nonaka's now traditional analysis framework for knowledge creation methods, it presents the dimensions that shape inter-organizational knowledge transfer.

The theory developed by Nonaka (1994) approaches the knowledge creation process through four practices: socialization, combination, internalization, and externalization.

Socialization is the conversion of tacit knowledge into new tacit knowledge through social, collective exchanges, and experiences shared by members of the organization (Alavi and Leidner 2001). Socialization operates through a common understanding of a problem, facilitated by sharing the same values and organizational culture. Nonaka and Konno (1998) brought out the concept of "Ba," a shared platform or space containing the foundations for knowledge creation, where knowledge is exchanged transcendentally between individuals. Socialization requires capture of tacit knowledge during

group work through "physical proximity": individuals share common values, face the same problems, and also share working time and sometimes leisure time. Nonaka and Konno argue that it is in organizations' interest to encourage the emergence of such places.

Knowledge is also created more explicitly, mainly by combination. Combination of knowledge consists of creating explicit knowledge by classifying, grouping, and summarizing existing explicit knowledge (Alavi and Leidner 2001). Combination can be an individual or collective process and notably concerns work on databases and statistical analyses. Although data creation is artificial, the combination and representation of the data can be a source of value creation and provide decision support. Data mining techniques, for example, do not theoretically create knowledge but can highlight links between data that may turn out to be very instructive for action. Nonaka and Konno (1998) argue that it is important to consider communication and the spread of processes, and the systematization and dissemination of such knowledge in the organization. Better access to data and appropriate presentation (schemas and decision trees) enable organizations to make concrete, practical steps forward.

Internalization creates tacit knowledge from explicit knowledge such as procedures and calculation methods and is also the basis for knowledge creation. Internalization is a creation process that can be classified as individual even though it results from exchanges of explicit knowledge, and yet the conversion and appropriation of this knowledge is closely related to individuals' cognitive capacities—their ability to discern the relevant knowledge. Internalization relates to learning capacities, since the knowledge is associated with action but can also be transferred in simulation exercises that describe virtual situations (Nonaka and Konno 1998).

Externalization consists of converting tacit knowledge into new explicit knowledge, for example, in the design of new procedures. This creation is collective in nature since, as Nonaka and Konno (1998) stress, the tacit knowledge has to be transcribed into a form that is comprehensible by others: "The sum of the individuals' intentions and ideas fuse and become integrated with the group's mental world."

The aim in this paper is to understand how these knowledge creation approaches are considered in the transfer of knowledge between two organizations.

According to Easterby-Smith et al. (2008), inter-organizational knowledge transfer is a complex phenomenon that deserves broader investigation. Several factors are involved in the process: the organizational capacities of the issuing and receiving companies, the nature of the knowledge being shared, and the inter-organizational dynamics (Argote et al. 2003; Van Wijk et al. 2008: Easterby-Smith et al. 2008).

First of all, the ability to acknowledge and absorb new information (absorptive capacity, Cohen and Levinthal 1990) and the ability to integrate them properly and then disseminate them internally (intra-organizational capacity) will have a positive influence on the dynamics of the transfer (Easterby-Smith et al. 2008). Past experience contributes to knowledge transfer within and between organizations (Van Wijk et al. 2008). The existing capacity may be innate or stimulated by learning, experience, and similarity of tasks (Argote et al. 2003). Similarly, Easterby-Smith et al. observe that actors' motivation is a determinant factor in the learning process, particularly when they are encouraged by norms of cooperation and social cohesion (Argote et al. 2003). Van Wijk et al. (2008) also mention size as an organizational factor that influences the capacity for transfer.

Next, the degree of "tacitness," ambiguity and complexity characteristic of the nature of the knowledge also plays a role in the inter-organizational knowledge transfer process. In the view of Van Wijk et al. (2008), causal ambiguity is an obstacle to inter-organizational knowledge transfer but also provides protection against imitation and capture by competitors of a company's sources of competitive advantage. Szulanski (1996), too, argues that difficulties in knowledge transfer depend not on the actors' motivation, but on their absorptive capacity, the existence of an irreducible component in tacit knowledge that complicates adaptation to a new concept (causal ambiguity) and interpersonal communication problems that could accentuate the difficulties inherent to the knowledge transfer process. Argote et al. (2003) also note that codified, explicit knowledge with no "causal ambiguity" is easier to transfer than tacit, ambiguous, "sticky" knowledge (Von Hippel 1994).

A final family of factors that influence inter-organizational transfers is founded on interaction dynamics between organizations, in particular relations of power and trust, and social bonds of varying intensity between the organizations involved in the transfers. Argote et al. (2003) argue that connection, frequent contacts, and a common language facilitate knowledge transfer. Van Wijk et al. (2008) also show that the features of social capital (structural, relational, and cognitive) are correlated to varying degrees with knowledge transfer. The intensity of bonds and the trust in the relational capital are notable factors in intra and inter-organizational knowledge transfer. Next, cognitive capital involving a common vision is also a vector for knowledge sharing. As a result, these types of knowledge transfer have an impact on the company's performance and innovation capacity.

Hendersen and Cockburn (1994) note that in turbulent environments, the best-performing companies are companies with the capacity to span their boundaries through "gatekeepers," key actors who can bridge the gap between the company and its environment.

Individuals thus form a powerful, vector for knowledge transfer "inside" and "between" organizations. Almeida and Kogut (1999) show that engineers' interfirm mobility contributes to the transfer of knowledge on innovations in the semi-conductors sector. Brown and Duguid (1998) report on the role of mediators ("translators" or "boundary spanners," Gittelman and Kogut 2003) who can translate knowledge, i.e., express "the interests of one community in terms of prospects for the other community" and the role of "knowledge brokers," people who have links with several communities and facilitate the flow of knowledge between them. Individuals are thus apparently capable of transferring both tacit and explicit knowledge and adapt their knowledge to the new context.

Clark and Fujimoto (1991) consider that organizations that invest in these organizational expansion procedures are more effective at product innovation. In a similar vein, Lopez and Esteves (2011) stress the interdependence of internal and external networks in the knowledge-acquisition process. The complementarity between architectural and routine capacities (Hendersen and Cockburn 1994), between the potential and actual absorptive capacities (Jansen et al. 2005), makes it possible not only to absorb external information but also integrate it properly into the organization.

In our opinion, the literature has not yet examined which modes of knowledge conversion as defined by Nonaka are used in the transfer of knowledge from one organization to another. This is the gap in the theory that this article seeks to fill through an in-depth case study.

In particular, we will analyze the case of a supermarket retailer that decided to outsource management control of its jewelry kiosk business and engaged a professional services company specializing in processing and analyzing national and international sales data for the purposes of reporting and management support.

Part II: Creating Value Through the Inter-organizational Information Process: the Case of Outsourcing Management Control by a Large Retail Group

Our aim here is to draw up a diagnosis of value creation and value sharing between two companies (outsourcer and service provider) through the inter-organizational information process. This is based on a combination of the value chain model and the information process model, which enabled us to define the theoretical framework presented earlier.

After presenting the case and the methodology used, we report the findings, which were used to enhance the theoretical framework and a critical examination of the creation of shared value for the two companies.

Case Presentation and Methodology

This approach is illustrated by a study of an IT service company that specializes in processing commercial information and involves observation of one process by which raw data was turned into strategic management information for a client company.

Presentation of company S

S[1] (100 employees; consolidated turnover of €55 million) was founded 28 years ago by its current CEO, whose background and skills relate to three areas: business, IT, and gemmology. He was one of the earliest creators in 1981 of "jewellery boutiques" specializing in fashion jewelry[2] (winning a national prize for innovation), and also a forerunner of "open access" jewelry shops adopting a less formal approach than traditional jewelers. When one of France's leading supermarket chains launched its own jewelry outlets, the CEO of company S offered to assist the competing supermarket retailer R to set up a similar business. Retailer R was specialized in food retail: having little knowledge of this new strategic business unit (SBU), it decided to outsource management of the new project in order to benefit from the skills and experience of a firm with relevant specialist knowledge. This situation is fairly rare in supermarket retailing and can be explained by the recognized advantages of the outsourcing process: it offers benefits in terms of both scale effects and learning effects, which are longer and more difficult to gain internally for a company starting up a new line of business at some distance from its traditional area of activity.

Today, company S manages 400 shops in 12 countries on three continents where group R has establishments. In particular, S manages the IT for the jewelries. The services provided cover:

- opening the jewelry
- designing the collections
- window displays
- training users of the company's software
- management of the sales software
- and most importantly, reporting

[1] For reasons of confidentiality, the specialist data processing company is referred to as S and the client firm, a supermarket retailer, as R.

[2] The principle is that articles are displayed in windows with reference numbers; the customer enters the number on a small screen to see full product details.

The 400 shops worldwide are connected to a database in real time, and the management controller's role is to turn the raw information into decision aid tools.
The supermarket group R thus totally outsources the management control of its jewelry business. S has seconded a management controller to its client R, to become group R's management controller for the jewelry business, with the role of providing appropriate advice and recommendations.
The information process of turning raw data into management action is thus inter-organizational.

We adopted a qualitative research method (Paillé and Mucchielli 2008). Most of the data was collected through interviews. This technique for collecting discursive data leads to in-depth understanding of the phenomenon studied, by examining the various meanings respondents assign to their experiences in the organizations. More precisely, we conducted focused, semi-directive interviews (Merton et al. 1990; Roussel and Wacheux 2005) with the management controller of company S seconded to retailer R. These interviews lasting 1 to 3 h on average were recorded and transcribed.

This approach is neither hypothetically deductive nor purely inductive. It is based on an analysis framework that is reassessed and enhanced through the practical study.

This case relates to the "interpretive-sensemaking method" insofar as "the method is more interested in seeking an in-depth understanding of human experience embedded in a rich, real-world context" (Tsang 2013, p. 198).

Findings: the Stakes and Limitations of Value Sharing

We identified and described the information process for management and management control, as a combination of several subprocesses in the two companies. A value diagnosis was also established for each subprocess, with the aim of identifying the sources of creation of overall value.

Identification and Description of the Inter-organizational Information Process: Towards a Diagnosis of Value Creation

In the transfer process, company S' specialist knowledge of the business and the tacit and collective knowledge of the sector were translated by various methods into a form comprehensible to R. The first of these methods is codification of knowledge through summary reports. For example, S created management reports using retail knowledge and databases to produce diagnoses and advice, reflecting externalization and creation of an understandable form of knowledge and data intended for managers in the client company. Knowledge from sales summaries is disseminated by a table of six increasingly detailed indicators: if the level 1 indicator is red, the user moves on to the next level for more details. The overall analysis can concern the amount of gold in the average customer spend, a breakdown by product family, or by geographical area or article.[3] Providing breakdown reports for management control is a central element of the contract between the two companies. To supply additional advice and more detailed analyses, especially at the level of variance analysis and forecasts, the experts from S try to propose additional analyses (not included in the initial contract) for R's management controllers. This contribution is considered the real value added of using a service

[3] Top sales by turnover, margin, and quantity.

company.[4] This type of transfer is more problematic because it is not only explicitly specified in the contract but also because it concerns higher levels of decision-making (questioning sales policies, renewal of collections in response to changing purchases, etc.): in a large company, decisions take a long time because of the time needed to communicate information. In the case studied, this transfer took place more informally through socialization via meetings, discussions, and group work in which the management controller of S was able to share his long experience and knowledge of the jewelry sector with members of R. Knowledge transfer took place at inter-organizational level between the two companies. They were able to exchange knowledge due to a certain degree of staff mobility (Song et al. 2003), i.e., secondment of company S' management controller to the client company. The transfers were formal (meetings between R group management and S executives in charge of preparing the reports), informal (because certain advice is given outside the actual reports), personal (meetings between S' executives with extensive experience in supermarket retail, plus IT and management control skills), and technical (since this knowledge is summarized into management reports sent to the management of the client group R). Knowledge transfer can be effective, and create value, only if the retailer's managers accept the advice and recommendations issued by the seconded management controller and utilize them in their decisions. Appropriation and usage of management reports proposed by the service company to the client company is in fact an attempt at internalization of management practices. The explicit knowledge used, namely a certain number of ratios that are relevant for management of the sales outlet and customer monitoring, must be understood, approved, and used, primarily in decision-making situations (for example, changing the stock policy). In the case studied, the point of the knowledge generated by management control and elaboration of management reports was to improve monitoring of the turnover of jewelry collections, identify the best sales, margins, and the popularity of new products, and thus promote the article categories that best match customer demand. This information underpins decisions regarding renewal of collections, taking regional effects into consideration.[5] All this knowledge is intended to manage stock qualitatively, not just quantitatively. As a result, it is vital to know which articles are in greatest demand, so that an appropriate stock can be planned to minimize the costs of slow-moving items (the stock displayed in the windows must have sufficient turnover to ensure that financial resources are not "tied up"). These analyses will create value when they are incorporated into choices and decision-making processes relating to the management of R group's jewelry outlets. Integration of new knowledge must lead to internalization by the decision-makers of the concepts and facts relevant for action (Nonaka 1994).

Through studying the different phases of the information process, a diagnosis of value creation was possible.

In the course of our study, the information-sharing zone as a channel for knowledge creation emerged as highly critical for value creation. We now discuss the value-sharing zone between the two companies, which is where the whole value of the information process appears to be concentrated. This question is approached through the concept of the value chain.

[4] According to the management controller from S seconded to R.

[5] Pearl necklaces, for instance, sell well in the Paris area but not in the south of France.

The Value Chain of the Inter-organizational Information Process

The path followed by knowledge dissemination between the two companies can be schematized through Porter's value chain model. Porter states that the level chosen to create a value chain is the level of the activities (business unit). The main activities selected in company S are extraction of data, organization of data (involving work on grouping, reprocessing, and standardization), data storage and analysis, and tailored presentation of the data to clients (in the form of management reports, the finished product). Support activities, i.e., activities that indirectly contribute to value creation, are the company's infrastructure, human resource management (particularly at the level of IT specialists, management controllers, and sales staff), technological data (data warehouse, databases, software creation) used to meet customer requirements, and supplies (electronic components, energy, travel, etc.). These support activities provide varying degrees of assistance in each primary activity (Fig. 2).

Company S differentiates itself by offering a qualitative "extra factor" compared to competitors (developers, controllers, other companies specialized in information systems). Its specialization in retail and the related experience effect (25 years of experience) gives its services genuine value added through the additional advice it can offer the client company.

The source of competitive advantage thus lies principally in the last two links of the value chain presented above: it concerns creation of management reports and advice. These value creating activities should be seen in parallel with the low knowledge of management control in supermarket retail as regards the jewelry sector (for example, the variance analysis proposed by the controller was very well received, although it is a standard control tool). The controller thus provides the management with additional analyses (not necessarily requested in the contract), including tailormade softwares, management control expertise, and knowledge of the sector.

In the case of S, value creation can be considered from two angles, as follows:

– Technical value creation: The knowledge that can be used results from a multi-stage process of transformation: extraction, integration into a single database, and storage (through database softwares).

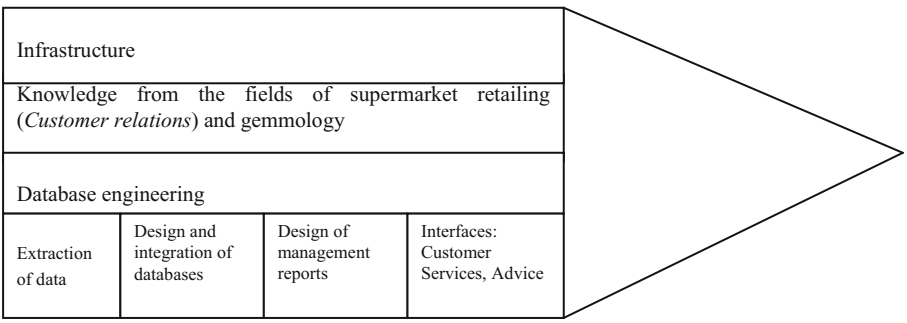

Fig. 2 The value chain of company S

However, use of the databases is only really capitalized on when the managers mobilize tacit knowledge drawn from their past experiences to create models appropriate to the real phenomenon studied. Another angle is the following:

– Cognitive value creation: which is complementary to and inseparable from technical value creation. Company S provides its expertise and experience in IT systems and the jewelry sector, to promote better decision-making for its client. More precisely, this concerns the last three phases of the information process: representation, transfer, and utilization.

The value chain of S must be compared with the value chain of R group (Fig. 3), to assess their complementarity. The starting point of R group's value chain is made up of output by company S, i.e., reprocessed sales information. The analysis and decision-making activities (stocks, renewal of collections, stock planning, orders, promotion policies, window display design, advertising, etc.) are applied to these data but based on the information and indications shown in the management reports (Appendix 1).

In inter-organizational sharing, the overall process (from extracting knowledge to utilizing that knowledge) creates a link between the two companies. Their two value chains are interlinked, and a zone of sharing and transfer was identified. The advantage of a formal value chain is that it can identify activities and interrelations that are a source of value creation. Value is created within activities and nourished and amplified throughout the process. The sequence of activities identified under the knowledge management model (Alavi and Leidner 2001) is what guarantees creation of value for the client company.

The points of contact between the two companies appear to be a zone for value sharing. In conclusion, value is created throughout the process of turning raw data into knowledge for action and appears to arise from exchanges between the two companies. The knowledge produced is thus contingent to each organization and the individuals that make it up. R group remains in control of its decisions concerning the jewelry business.

The difficulty lies in ensuring favorable conditions for transfer (role of the S management controller seconded to R group as management controller of the jewelry

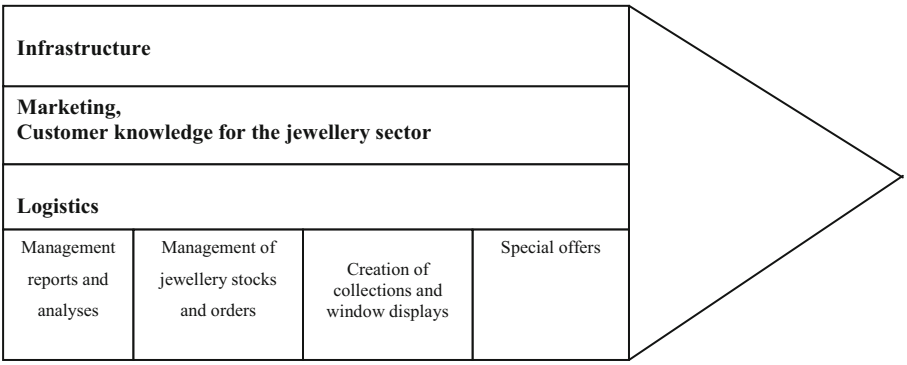

Fig. 3 The value chain of retailer R

business for the entire group), and the capacities and desire of the senior executives of R to internalize new knowledge (acknowledging the usefulness of new knowledge, learning capacities, etc.). However, different actors have different perceptions of value creation. In the case studied, R group said that S only contributes reprocessed information, managing the information process but not producing any analyses, whereas according to S, the value added created for R lies in the analyses provided, which the management of R group examines in meetings.

Conclusion

This case study has enabled us to clarify our research question on the value chain of the information process that takes place at inter-organizational level. Highlighting a value sharing zone focused the study on the critical phases of the process, i.e., transfer of knowledge by externalization (formal management reports) and socialization (informal advice and recommendations), and knowledge utilization (internalization of advice to guide decisions by the retail company's managers).

The use of information-processing technologies contributes to technical value creation. The desire to have all an organization's data in a single database is driven by the need to memorize and make accessible all data likely to improve the work, and above all the level of knowledge, of the members of an organization. However, use of the database only creates value when the managers use tacit knowledge deriving from their previous experiences to create models appropriate to the real phenomenon studied. This is cognitive value creation, which is complementary to and inseparable from technical value creation.

Value is distributed throughout the intra-organizational activities and also at inter-organizational level. The specificity of value creation lies in the fact that it takes place at the interface between two organizations and is consequently dependent on key mediating actors ("translators" or "boundary spanners" in the words of Gittelman and Kogut 2003). Knowledge transfer between entities is performed by the expert from company S, who plays the role of Bollecker's (2002) translator of information and analyses that contribute to coding and reappropriation of knowledge by R group's controllers, corresponding to socialization and internalization as defined by Nonaka (1994). These are the critical phases in the value chain, since the relevance of the chain may be challenged if the knowledge produced is not utilized (for example, if R's managers do not act on the advice or suggestions made by the management controller). But if applied to action, they generate learning: in a "single loop" (Argyris and Schön 1978) when a certain number of corrective measures are taken, for example, to promote sales or increase margins on a given product or renew collections, or in a "double loop" when the objectives themselves are called into question (Bollecker 2002).

One advantage of the value chain is thus that it provides a basis for reflection on the opportunities for outsourcing of certain activities. Generally, it is in a company's interest to focus on the parts of the chain in which it has the most expertise, or those with the lowest costs, or on the contrary those that are sources of differentiation and value for the customer.

Group R's decision to outsource is largely explained by its poor knowledge of the jewelry sector, since its traditional business was food retail. Outsourcing commercial

information processing to an external company is a very unusual step in this group. The fundamental question for R group is whether the outsourced activities generate competence that lies at the source of its competitivity, in other words, whether the outsourced activities are strategic. One of the risks is transferring to the service provider S a fundamental type of knowledge related to R's core business. In this specific case, is R group voluntarily relinquishing control over knowledge of its own customers (through their purchasing behavior)?

The main contribution of this article is that it provides a more nuanced view of the exchange process, by showing how mechanisms for transferring information from one organization to another form an opportunity for knowledge creation, which is true value added for the client company. But the partnership remains fragile due to the stakeholders' contradictory motivations: for instance, R's aim to capture S' knowhow, or S' need to maintain a competitive advantage that is difficult to replace or imitate.

Further research should provide some more answers to the questions raised and compensate for the methodological shortcomings of this study, which only comprises a single case. Transposition of the study to new settings (different firm size and business sector) should pave the way for analytical generalization as referred to by Yin (2003).

Appendix 1

Table 1 Examples of indicators produced for sales reporting

Overall sales	Breakdown by product family	Breakdown by store, region, and geographical area
- Sales revenue - Quantity - Margin rate - Average spend - Gold weight - Item turnover rate - Buyers as percentage of all customers entering the store	- By family, e.g., family W (wedding ring) - By subfamily, e.g., W1 (plain solid gold wedding ring) and W2 (decorated wedding ring) - By article	- Store rankings - Showing growth and degrowth, to identify stores where business is rising/falling
Breakdown by item reference	**Stock breakdowns**	**Transaction analysis**
- Top-selling items - Top 100 by sales revenue - Top 100 by quantity - Top 100 by margin	- Breakdown by stock components - Stock turnover - Sales orientation in relation to items in stock - Stock by subfamily, to be considered in conjunction with sales by subfamily - Stock value/sales revenues	Result of advertising brochures or special offers

The principle adopted is management by exception: further detail is only examined when an indicator is "red"

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