ICT Enabled Distribution of Services: Service Positioning Strategies, Front Office Information and Multi-channeling

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In this paper we present a theoretical framework for information technology supported knowledge management in hybrid supply channels. The framework has been applied to IBM in an exploratory case study. The study supports the framework. The framework characterizes the competitive environment of companies and describes the resulting need for hybrid channeling and effective partnering. For hybrid channeling three types of knowledge are important: contextual, operational and functional knowledge. For partners situated upstream in the channel contextual knowledge is the hardest to acquire. One needs its partners situated downstream in the channel to provide this knowledge. These partners on the other hand need their upstream partners to provide functional and operational knowledge. Information technology is a powerful tool for knowledge management in supply chains by providing four functions: adviser, assistant, librarian and teacher.

Introduction

Knowledge is becoming increasingly important in channel management. The only way to compete seems to add more knowledge to products and services to serve customers with added value and to create new business constantly (Huizenga and Hartog, 1998). Partnering relationships have become increasingly prevalent in the value chain of most enterprises. The growing dynamic of markets makes it more difficult for organizations to meet customer needs and to create value on their own (Saint-Onge, 1998).

Saint-Onge (1998) makes the following statements about knowledge in channels.

- "In the knowledge economy, the quality of relationships between business partners will determine the extent to which value is added for the customers they both serve."
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- Building the level of trust in such relationships is essential to redefining relationships which otherwise tend to deteriorate and to gravitate to the either end of a dependence / independence spectrum.
- The level of trust and partnering between manufacturer and distributor in turn provides the basis for engendering customer loyalty.
- These partnerships work best when their focus is on creating value for the customer.
- The convergence of perspectives required for effective partnering will best be achieved through an ongoing knowledge sharing and regular strategic dialogues.

Ongoing knowledge sharing is critical to effective partnering in a channel. Increasingly value is created at the customer interface where the needs and aspirations of customers are at the root of customizing solutions. If distributors are unable to partner effectively, it will be very difficult for them to instill a strong sense of trust and partnership with their customers. Customers will have a high level of satisfaction if the distribution partner shows commitment and ownership for the outcome of the transaction although part of the transaction is produced by other partners in the supply chain. One can assume that the relationship between distributors and customers will be negatively influenced by poor partnership between manufacturers and distributors (Saint-Onge, 1998).

Problem Definition

The objective of this study is to examine how information technology (IT) enabled knowledge management contributes to channel management in today's competitive environment. The following research questions guided our work.

1. Which environmental developments effect channel design?
2. How important is effective partnering in channels?
3. How does knowledge management contribute to effective partnering between channel members?
4. How do organizations apply information technology to support knowledge management in supply channels?

We expect IT enabled knowledge sharing between channel members to enhance effective partnering, which is necessary for hybrid channeling. Hybrid channeling is supposed to be necessary for organizations to compete successfully in today's dynamic markets. We studied both the knowledge management and channel management literature and constructed a theoretical framework which we used in an exploratory case study to gain a first insight into the field of IT enabled knowledge management in channel management. We discuss this theoretical framework starting with the environmental factors which influence channel design, followed by
elements that become prevalent in channel design and we end the discussion with the effect of IT-enabled knowledge management on effective partnering in hybrid channels. After presenting the framework we will discuss the research methodology, the analysis of the case and our interpretation of the findings of the study.

Theoretical Framework

We developed a theoretical framework shown in figure 11.1. In this framework the competitive environment causes channel strategies to take a hybrid form. Hybrid channel strategies make it necessary to manage and to share knowledge with partners in the channel. IT supports knowledge sharing.

![Theoretical framework](image-url)
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Competitive Environment
Three major factors influence channel design: the high velocity of markets, power at the end of the chain and concentration on core capabilities.

High Velocity Market
All channels drift out of alignment with supplier and customer needs over time, but nowadays these changes are occurring so swiftly that there is no time to determine whether an initial channel design is effective (Anderson et al., 1997). Eisenhardt and Zbaracki (1992) call this a 'high-velocity' environment. A high velocity market is caused by shortened life-cycles and unpredictable demand or fast changing customer wishes. These are results of products getting more innovative. Functional products satisfy basic needs. Products become innovative when a company introduces innovations to give customers an additional reason to buy. Although innovations enable a company to achieve higher profit margins, the very newness of the innovative product makes demand unpredictable. The life cycle of innovative products is short, usually 3 to 12 months (Fisher, 1997).

One way to reduce the uncertainty resulting from innovative products is by having different products share common components, mass customization. Mass customization is also triggered by the new abilities to address customers in small groups through database technologies and by flexible manufacturing. Markets are fragmented into segments so diverse that products need to be mass customized. The essence of mass customization is the ability to customize large volumes of products out of standard components and deliver them at mass production prices. Organizations that use this kind of customization minimize cost by not keeping inventories of finished products. Instead they stock raw materials or component parts and assemble them into finished products only in response to the actual needs of individual customers (Boynton et al., 1993; Gilmore and Pine, 1997). Customer expectations are raised, which puts further strain on distribution channels.

Power at the End of the Chain
Increasingly value is created at the customer interface where the needs and aspirations of customers are the basis for shaping solutions (Saint-Onge, 1998). Customers demand value adding and accessible distribution services which supply products and services in the most cost and time efficient way. Service companies have given the end-consumers more power by allowing them to dictate their individual and collective wishes through customer response systems. The secret of success for the service community is the ability to discover these end-customer trends and to supply for them (Quinn, 1992). Value creation at the customer interface and mass customization shifts the power in the channel downwards. Distributors and customers gain more power and manufacturers are loosing power. Manufacturers become dependent on channel partners for their market information and the assembling of components into mass customized products.

According to Porters' Industry forces model (Porter, 1980) three forces underlie buyers' power.
Chapter Eleven: Knowledge Management in Hybrid Supply Channels

- Enhanced bargaining power. Many observers believe that manufacturers have lost ground to distributors, but analysis reveals that both have lost power to the consumer (Anderson et al., 1997; Hagel et al., 1997).
- More knowledgeable buyers. Large resellers increased their knowledge of the producers’ costs, their own operation costs and profits for each item, and their customers’ needs (Anderson et al., 1997).
- Credible threats of backward integration. Distributors can further enhance their power by threatening to take over some of the suppliers’ activities, thereby strengthening their relationship with the end consumer (Anderson et al., 1997).

Concentration on Core Capabilities

Firms are handing off non critical activities or functions to concentrate on enhancing their core capabilities (Stalk et al., 1992). Activities are performed where they make the most sense. Any activity that is not pivotal to the strategy of the organization can better be outsourced. Specialization on production or distribution activities is common.

Channel Design

Changes in the environment affect channel design. In the framework we recognize the need for hybrid channels in which multiple channels are adaptive and composed of specialists. Partnering by combining strengths is essential in hybrid channel designs.

Multiple Channels

Multiple channels are most prevalent in high velocity markets (Anderson et al., 1997). There is considerable movement between segments and across purchases. Moreover, with accelerating product life cycles and fragmentation of customer segments, multiple channel approaches are often the only way to provide market coverage. Because of mass customization, the linear channel configuration doesn't apply any more, channel diversity is triggered (Anderson et al., 1997). Multiple channels reflect the range of channel options available (see figure 11.2). In managing multiple channels, companies demarcate products by channels, thus minimizing direct comparison. Despite product differences, competing channels sometimes offer similar problem-solving capabilities by patching or bundling products appropriately.

Adaptive Channels

Innovative products require a fundamentally different supply chain (Fisher, 1997). The uncertain market reaction to innovative products increases the risk of shortage or excess supplies. This demand uncertainty can be dealt with by creating adaptive
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supply chains. A supply chain performs two distinctive types of functions, a physical function and a market mediation function. The physical function includes converting raw materials into parts, components and eventually finished goods and transporting them. For innovative products this means producing for mass customization, cutting lead-times and increasing the supply chain’s flexibility. The market mediation function has the purpose of assuring that the variety of products reaching the marketplace matches customer demand. The market mediation function becomes increasingly important when products become innovative and requires close partnership and sharing of knowledge of customers and products.

In a high velocity market with power at the end of the chain, firms must experiment with different ways of reaching the market (Anderson et al., 1997). All kinds of new channels become available through innovations in marketing (for example, direct marketing, telemarketing, database marketing) and the application of IT, like electronic commerce (Kierzkowski et al., 1996; Alba et al., 1997), virtual communities (Hagel et al., 1997), multimedia call centers and cybermediairies (Sarkar et al., 1995). These innovations result in new ways to reach new and existing markets with different service levels and have the capability of changing the distribution of power in chains by alternating the market mediation function of chains (Kierzkowski et al., 1996). Reacting quickly on the feedback of the experiments to find out the effectivity of the channel configuration is essential (Saint-Onge, 1998).

Figure 11.2: Multiple Channels (Anderson et al., 1997).
Composite Channels

A firm does better in uncertain environments by dealing through many specialists because specialists tend to be focused and have valuable local knowledge of small market niches which facilitates responding to changing market demands (the market mediation function). The manufacturer cannot acquire as much market knowledge as many local entities can. This results in composite channels, in which both the supplier and its channel partners divide the execution of the channel functions (see figure 11.3). A team of channel partners, each specialized in a few tasks, satisfies the customers total needs. New arrangements focus on growing demands for broader market offerings, products and services that the channel member does not normally provide, by agreeing to pool resources and capabilities. All members in the hybrid system must adequately perform their functional responsibilities for the final sale to occur. The objective is to improve the quality of service throughout the distribution channel by capability sharing agreements and by substituting the superior capabilities of one member for the inferior of another. Composite channels are costly to manage and seem to work only in environments that can afford high channel margins (Saint-Onge, 1998). The trend towards composite channels is driven by the high velocity of the market, concentration on core capabilities and shift of power to the end of the chain.

In composite channels the producer will no longer be the owner and manager of material activa but becomes more the coordinator and center of intellectual activa. The only source of sustainable competitiveness will come from skills, experience and knowledge of the market. These are all knowledge based service providing activities which are harder to imitate or exceed (Quinn, 1992).

Figure 11.3: Composite channels (Anderson et al., 1997)
Hybrid Channel Designs and Partnering by Combining Strengths

These effects require hybrid channel designs, adaptive designs composed of multiple specialist partners, by which high market coverage can be reached and different customer needs can be satisfied. "The resulting networks of value adding partnerships are like confederations of specialists. These networks are flexible, specialized and emphasize inter firm relationships, with a pooling of complementary skills and resources to achieve shared goals" (Saint-Onge, 1998). These are webs of capabilities in an extended enterprise (Narus and Anderson, 1996). The mutual benefits are increasingly feasible because of advances in information technology that have sharply reduced the costs of coordinating and administering transactions between partners (Gurbaxani et al., 1991; Anderson et al., 1997; Jansen et al., 1997).

In hybrid channel designs trust and the quality of the relationship between manufacturers and distribution agents are important. If they are unable to partner effectively, it will be difficult for distributors to instill a strong sense of trust and partnership with customers (Saint-Onge, 1998). Successful partnerships usually have three things in common: reliability, willingness to cooperate and openness (Quinn, 1992). Some firms have very close (almost seamless) relationships with their distributor while other firms have numerous arrangements, thereby diversifying their channels to match the diverse needs in their markets (Anderson et al., 1997). The convergence of perspectives required for effective partnering will best be achieved through an ongoing knowledge sharing (Saint-Onge, 1998).

Knowledge Management

Changes in the competitive environment and channel design cause the need for organizations to adapt the design of organizational processes. Several organizational concepts can help organizations to cope with these challenges. We discuss the concept of knowledge management. To be able to create a responsive distribution channel, partners in the channel need to share their knowledge to meet market requirements effectively. The only way to beat competition seems to add more knowledge to products and services to serve customers with added value and to create new business constantly (Saint-Onge, 1998). Before going further into the framework we define data, information, knowledge, learning and the scope of our study.

Data, Information, Knowledge and Learning

Weggeman (1997) refers to data as the representation of numbers, quantities or facts. Information is created when a person gives meaning to given data. Knowledge is information that has been understood, interpreted and validated in the context of application. As such, knowledge presents a recognized platform for action. Considering this definition, knowledge has to be purposeful and useful (Saint-Onge, 1998). Two types of knowledge can be distinguished: explicit and tacit knowledge (Nonaka, 1991; Nonaka and Takeuchi, 1995). Explicit knowledge can be written
down and communicated and be made impersonal. Tacit or implicit knowledge are personal experiences, skills and attitudes (norms and values). It's difficult to share this kind of knowledge with others because it's hard to formalize. Knowledge is a personal ability, to be seen as a product of information, experiences and attitudes. Learning occurs when knowledge is created or enriched. Learning can be seen as a process in which knowledge is the input and the output (Weggeman, 1997).

In this study we confine ourselves to the information element of knowledge, to explicit knowledge expressed in symbols which can be stored and communicated by IT. We assume the information to be understood, interpreted and validated by the right people within the channel. In our opinion the sharing of information, as being a crucial component of knowledge, is an integral part of knowledge management. When we look at the knowledge versus the information distinction as a continuum (Davenport et al., 1998), we're in the middle. We're taking a rather ‘static’ perspective on knowledge management in contrast to more dynamic concepts like learning (Ciborra and Andreu, 1995), learning ladders (Ciborra and Andreu, 1995), knowledge creation (Nonaka and Takeuchi, 1995) or organizational knowing cycles (Choo, 1998). We merely treat knowledge as an ‘it’ (Davenport et al., 1998) as opposed to a ‘process’.

**Knowledge Sharing between Partners**

According to Huizenga and den Hartog (1998) it is important for an organization to share and combine three types of organizational knowledge to meet market requirements effectively:

- contextual knowledge about the market environment, supplier and customer needs;
- operational knowledge on experiences with organizational processes;
- functional knowledge, knowledge within certain disciplines, specialists.

The more an organization is situated upstream in a channel (like manufacturers) the harder it will be to acquire contextual knowledge because its distance to the market and end customers is the largest. On the other hand, organizations downstream in the channel (like distributors and retailers) will have detailed contextual knowledge available. However, these organizations will feel a higher need for the operational and functional knowledge of available processes and products, because of its distance to research and (product) development and production. So these organizations will need knowledge about the capabilities and work practices of organizations upstream in the chain. The art to create customer added value at the end of the chain is to combine these three kinds of knowledge.

**IT Supported Knowledge Management**

Knowledge management is often connected with the use of information technologies, like artificial intelligence, expert systems, neural networks, decision support systems, groupware, internet, intranets, simulation tools, knowledge bases
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etc. However, the application of technologies like this can never be the only element of knowledge management, but it can be supportive tools (Post and Weggeman, 1998). Other elements are a supportive management style, organizational structure and culture (Spek, 1998). Davenport et al. (1998) studied 31 knowledge management projects and identified four broad types of objectives: create knowledge repositories, improve knowledge access, enhance the knowledge environment and manage knowledge as an asset. The first two objectives of Davenport et al. refer to the application of IT, the last two mainly refer to the other elements of knowledge management.

IT systems can contain only the explicit knowledge of an organization (Weggeman, 1997). For tacit knowledge, information systems can be used only as 'knowledge maps of the organization' directing towards people who might possess the tacit knowledge. Davenport et al. (1998) use the metaphor of 'Yellow Pages'. Developments in information and communication technology have made it possible to store, edit and transport large quantities of explicit knowledge and make it available worldwide.

There are four functions of information systems in knowledge management (Weggeman, 1997).

1. Adviser. The system can deduct new knowledge by applying knowledge 'rules' onto saved information. Examples are expert systems, knowledge systems and neural networks.

2. Assistant. By giving on-line support, like decision support systems or executive information systems. These systems extract information from a large quantity of data and support decision making.

3. Librarian. Giving entry to literature and other information directories. Knowledge discovery systems, data-mining, database systems, intranets and extranets are examples. These systems are meant to enter, keep and look up large quantities of data. This function resembles the first two goals (create knowledge repositories and improve knowledge access) of knowledge management projects found by Davenport et al. (1998).

4. Teacher. To offer training facilities by computer, like for instance by simulations or programmed instructions.

Method

We applied the theoretical framework to IBM in a case study. Case research is conducted in studies which deal with 'how' and 'why' questions regarding contemporary events, over which the researcher has little or no control and in which the borders between the phenomenon of interest and its context are not clear (Yin, 1994). Moreover, case research is applied to study phenomena not supported by a strong theoretical base (Benbasat et al., 1987). These criteria apply to this study.

This study can be characterized as an exploratory, single case study (Yin, 1994). The case study is an accepted strategy for exploration (Benbasat et al., 1987; Lee,
1989; Yin, 1994). De Vries and Roest (1999) studied 56 case studies published in 1996 and 1997, of which almost two third can be typified as exploratory. We chose for an exploratory study because the relation between knowledge management and channel management is not supported by a strong theoretical base. We conducted the study to evaluate the theoretical framework and to revise it if needed.

We chose IBM as the object of our study because of the company’s outstanding record in the application of modern technologies. Furthermore IBM is the only IT provider in the world which is bigger in turnover than its biggest buyer in the channel (Quinn, 1992). IBM can be seen as a channel and information director within its channels and has great potential to become knowledge director as well. In many markets global competitors are providing the impetus for innovation (Narus and Anderson, 1996). IBM’s global improvement program Customer Relationship Management (CRM) is our unit of analysis. CRM can be seen as a knowledge management project, so our unit of analysis resembles the one of Davenport et al. (1998).

For data collection, triangulation is applied (Yin, 1994). Five sources of evidence were used: internal IBM documents, interviews, information systems, direct observation (internship) and participant observation (working on implementing part of PartnerInfo). For data analysis we made use of the technique pattern matching. In pattern matching an empirically based pattern is compared with a predicted one (Yin, 1994).

Analysis

By going through the different elements of the theoretical framework we discuss IBM’s competitive environment, channel design, improvement program Customer Relationship Management and communication tool PartnerInfo.

IBM Corporation

IBM was founded in 1896 and has become world’s largest Information Technology provider, doing business in over 140 countries. In the early 90's market shares dropped in the PC segments and systems software and growth figures started to decline. IBM fell from first to the eleventh position in customer satisfaction ratings. The traditional mainframe market, on which IBM had always concentrated, started to decline severely. The market started to change from a product oriented marketplace towards a solutions and services oriented marketplace. In 1993, Louis Gerstner was appointed as IBM’s CEO. Gerstner brought with him a customer oriented sensibility. Soon after he arrived, he had to take dramatic action to stabilize the company. Despite mounting pressure to split IBM in separate, independent companies (Baby Blue's) he decided to keep the company together. He recognized that one of IBM's enduring strengths was its ability to provide integrated solutions for customers as a company. In 1995 IBM acquired Lotus Development Corp., and in 1996 Tivoli Systems Inc. Services became the fastest growing segment of the company, with a growth rate at more than 20 percent per year. From 1993 to 1996
the market value of IBM increased by more than $50 billion. In 1997 IBM had a
total revenue of $78,508 million and a total of 269,465 employees worldwide
(www.ibm.com/IBM/history).

We emphasized our study to IBM Netherlands (IBM NL). IBM NL belongs to a
region called EMEA (Europe, Middle East and Africa). IBM NL's activities cover a
wide variety of hardware products to a corresponding variety of services,
applications and system software. IBM NL changed considerably during the 90's,
the number of employees decreased, the total revenues increased. The organization
is currently consisting of five divisions: Marketing and Services, International
Logistics, European Repair Center, International Operations and International
Maintenance Parts Logistics.

The Customer Relationship Management Program
A worldwide improvement plan was developed called Customer Relationship
Management (CRM). CRM is a process driven approach to organize business
towards customer satisfaction. CRM is designed market-back. Seven customer
imperatives were the starting point of the approach: fulfilling commitments; ease of
doing business; cost/price; understanding the customer; responsiveness;
communication and competence. Eleven processes have been identified to address
customer needs effectively and efficiently. CRM processes are reshaping sales,
services and support for people working directly with customers, these can be both
IBM employees and Business Partners. When CRM is implemented completely,
both Business Partners and IBM will have the same access to relevant CRM
processes.

The official IBM definition for a Business Partner is any non-IBM organization
that provides end users with information handling solutions that use or rely on an
IBM offering and has a written contract with IBM that defines the ongoing
relationship. A worldwide classification of Business Partner types has been adopted,
called the New Channel Agreement. Furthermore a 'Business Partner Charter' has
been introduced to make the importance of partnerships clear to (future) Business
Partners. Business Partner relations and contracts have been standardized for all
IBM brands. This makes it easier for Business Partners to do business with IBM
worldwide.

To enable Business Partners to provide excellent service PartnerInfo has been
developed. It provides Business Partners with the information and knowledge they
need to service their customers. More than a million documents and thousands of
applications could beneficially be used by Business Partners. PartnerInfo will
provide Business Partners with a single pathway to vital information, business
programs and shared projects with IBM and other Business Partners. It is estimated
that PartnerInfo will reduce the number of front-end access systems to IBM
information from 37 to one. PartnerInfo will provide the interface to more than 500
databases. There are a few more benefits to be identified: information is always
updated and accurate; information is available and accessible everywhere and
PartnerInfo is based on standard software.
IBM’s Competitive Environment

High Velocity Market
IBM experiences fast changing demand patterns of customers and the shortening of product life cycles. There has been a shift from complex products towards more commodity goods and from low volume, high value, few customer markets towards markets with high volume, low value and many customers. At the same time the industry is introducing all kinds of innovations to give the customer reasons to buy which go beyond basic needs. Hardware and software are innovative products. The average product life cycle of PC’s is for instance estimated to be 7 months. The unpredictability of demand for innovative products is illustrated by the introduction of the IBM ThinkPad (Fisher, 1997). The ThinkPad had a novel cursor control in the middle of the keyboard. Customers’ reactions were more enthusiastic than IBM expected, resulting in supply shortage. Mass customization is the trend in the middle segment in IBM’s industry. Custom made one-of-a-kind solutions are shaped for the upper end of the market.

Power at the End of the Chain
IBM observes several changes in market trends. We can recognize in these market trends customers need for cost and time efficiency, value adding at customer interface and an increase in buyer’s power. Customers have different perceptions of added value at every transaction, which influences the price they are willing to pay and their satisfaction with products and services. The changing buying behavior implies that the customer wants to choose with every purchase how it wants to receive the product. Because the knowledge of products and services of the end-users has expanded, the trust of buyers in low value adding channels has increased. In the upper end of the market, customers want one-of-a-kind solutions. Mass customization is the trend in the middle segment in this industry.

Still, IBM is the only IT supplier which is larger in revenue as their biggest buyer in the channel. It therefore has much power in the channel, also because of IBM’s well-known brand. The demand in IT resources is still bigger than the supply. However, IBM is experiencing shrinkage of this channel power, especially for commodity products, like PCs of which customers become more knowledgeable. Organizations that are closer to the customer and advise the customer, have gained power because of growing competition for space and mind share in channels, resulting in higher demands on manufacturers. Two-tier distribution is growing fast, which makes it necessary for the manufacturer to build a marketing relationship with the remarketer behind the distributor, which is the case for IBM.

Concentration on Core Capabilities
IBM values its abilities as a company to provide integrated solutions to its customers as a core capability. We can recognize that this capability is core because it’s valuable, rare, imperfectly imitable and has no strategically equivalent substitute (Ciborra and Andreu, 1995). IBM signaled successes of other IT suppliers with No
frills / Low cost channels. IBM doesn't have much experience with these kinds of channels because of its concentration in the past on full service products. Because IBM doesn't have the capability to serve also small customers with off-the-shelf products, it works together with Business Partners who have that capability.

**IBM's Channel Design**

**Multiple Channels**

Figure 11.4 shows IBM's vision on how the IT industry brings her products to the market. Consultants or system integrators provide one-of-a-kind solutions to corporate accounts or small and medium enterprises. These are channels that add most value to the manufacturer's product. On the other hand there are channel members that provide mass customized or off-the-shelf solutions to small and medium enterprises (SME), SOHO (Small Office / Home Office) and consumers, these channels are less value adding. This vision on distribution leads to a multiple channel strategy in which IBM’s traditional channels are supplemented by indirect ways of distribution and make use of volume distributors (two-tier distribution).

Competitors of IBM also recognize this need and are developing cost-effective distribution channels. Two-tier distribution (indirect distribution, for example by wholesalers) is part of the channel programs of SUN, HP and DEC. DELL, Oracle and Silicon Graphics have built direct marketing as an integral part into their strategy. HP uses a hybrid form of channel strategy: direct marketing in cooperation with external channels.
Adaptive Channels

IBM has a long history in adapting its channel strategy to the market. During the 1980's IBM doubled its direct sales force and added 18 new channels to communicate with customers (Moriarty and Moran, 1990). Nowadays's continuous experimentation can be seen in the diverse ways IBM is reaching its market. Direct-mail, electronic commerce, interactive marketing, each type relevant to the stage of the life cycle the product is in. With the Routes-to-Market method a hybrid channel strategy for every product can be designed. This route shows the internal and external (Business Partners) resources that are needed to communicate, provide and service an offering through the entire product life-cycle. For every product the route can be different, and can be adjusted as environmental factors change.

Dependent on the product or service and the customer, products will be distributed through a volume distributor, through a retail service or product-chain, or by a dealer, Value Added Reseller or system integrator. For its innovative products IBM designed several information systems to support the market mediation function of its channels, like Skill Management, Search4Solutions and PartnerLeads (see paragraph about IBM's knowledge sharing).

Composite Channels

IBM uses composite channels, it generates demand through its own sales force, physically distributes its products through outside distributors and serves installed bases together with outside service specialists. Specialization can be found in the way CRM processes work. Both IBM resources and Business Partners resources participate and contribute to these processes to satisfy customer needs. Examples of CRM processes are Solution Design and Delivery, Opportunity Management and Offering Information. The way channel strategies for every product are determined by the Routes-to-Market method is also a good example of specialization because the different processes are assigned to internal and external resources. The route is, among others, defined by the distribution capacity and trends; core competencies of IBM and Business Partners and the sales activity of chains.

Partnering and Combining Strengths

Partnering and combining strengths is recognizable at IBM. IBM forecasts an increase in the percentages of business which should be conducted through Business Partners by 2000. The Business Partner Charter is clear evidence of the importance of partnering.

"We understand that the complexity and dynamic nature of the marketplace continuously present challenges to both of us. That's why we are directly addressing these challenges by enhancing cooperation between IBM and its Business Partners. We have established organizations dedicated to supporting Business Partners around the world. They are committed to building long-term relationships and rapidly addressing your needs and issues." (Business Partner Charter, 1997).

The major drive for IBM to partner in the channel seems to be to serve the commodity market, for which IBM doesn't have the resources and experience.
Knowledge Sharing Through PartnerInfo
PartnerInfo contains different applications to support four important processes of CRM.

- Skill management.
- Offering information.
- Solution design and delivery.
- Opportunity management.

These IT-resources enable Business Partners and IBM to share knowledge to satisfy their customer needs and conduct business.

Skills Management
Business Partner Skills is an application that offers information about the skills that are available with certain Business Partners and with IBM employees, the ‘Yellow Pages’ of the channel. Furthermore it provides information for skill planning and development of Business Partners. This skill database is used with the Market Management process of CRM to signal gaps between current skills and skills needed in market segments that will be important in the future.

This application is a tool to find and to put to use knowledge and skills that are available with Business Partners, thereby locating the functional and operational knowledge of IBM and her Business Partners and offering the ability to share this knowledge through the channel. The knowledge available to Business Partners is combined with contextual knowledge IBM has acquired herself. By indicating the gap between needed and current skills IBM can start knowledge creation at Business Partners when needed according to IBM’s contextual knowledge.

Offering Information
Search4Solutions provides an easy to use web based tool set on which Business Partners can submit descriptions of the IT solutions they provide in the marketplace. These descriptions are accessible to customers, business partners and IBM. The description contains not only the offered solution, but also information about the partner, including the market position and contact information.

With this application functional and operational knowledge can be located directly by customers and Business Partners. When customers, which represent contextual knowledge, use this application to locate and get in touch with IBM or a Business Partner, functional and operational knowledge is effectively combined with contextual knowledge. All channel members can also use this tool to combine contextual knowledge they experienced in their environment through customer wishes, with the functional and operational knowledge of other channel members, which they can locate with Search4Solutions.

Opportunity Management
The opportunity management process is designed to make sensible decisions about opportunities that will be pursued to avoid pursuing opportunities that turn out to be
unattractive. PartnerLeads provides an electronic mechanism for IBM to pass leads to Business Partners and track the status of the partner's handling of these leads. It is also a tool to manage the business partner performance by IBM. Leads are classified and assigned to the appropriate Business Partner type. By using for example Search4Solutions a number of appropriate Business Partner profiles can be selected.

By sharing opportunities with Business Partners, IBM is passing on contextual knowledge to these Business Partners. Business Partners can combine this knowledge with functional and operational knowledge, which they have available. To make a successful combination between the contextual knowledge (the lead) and the functional and operational knowledge (the capabilities of Business Partner) IBM makes use of the Search4Solution application.

**Solution Design and Delivery**

This part of PartnerInfo provides a suite of business applications that enable Business Partners to procure goods and services electronically from IBM through PartnerInfo/Electronic Commerce. These applications will make Business Partners browse electronic catalogues, select items to buy and automatically fill out an order form. In this way one point of ordering is created (one-stop-shop) for all product units, the Business Partner can combine order lines and determine it's delivery time. Items will be automatically checked against the product catalogue to retrieve the price. Prices are custom shown for each Business Partner. The application electronically transmits the orders to the appropriate IBM Fulfillment System for processing. When the order is processed an acknowledgment is sent back with committed delivery times. This application makes it easier for the business partner to communicate to their customers and choose the best solution in delivery times, price and quality. Furthermore, the business partner can track orders throughout the fulfillment cycle.

With this application the Business Partner can combine its contextual knowledge (its customer wishes) with IBM's functional and operational knowledge (its product and service possibilities).

**Functions of PartnerInfo in Knowledge Management**

We identified four functions of information systems in knowledge management. In all the applications we can recognize the function of *assistant*, giving on-line support by extracting the desired information from a large quantity of data. PartnerInfo itself also provides a *librarian* function, it gives access to diverse information directories. Within PartnerInfo there is also a module that provides training facilities for the Business Partner, in this sense providing the function of *teacher*. The adviser function is not directly prevalent in PartnerInfo.

**Discussion**
We review the conclusion we derived from applying our theoretical model to IBM NL. Considering this discussion we will give recommendations for further study.

The model of knowledge management in channel management could be recognized in IBM's case for a great deal although we found some deviations.

The factors that result from the competitive environment and which influence channel design are all relevant to IBM, especially a high velocity market. We found a unique core competence with IBM; the ability to provide customers with an integrated solution, although the tendency to concentrate on core competencies which we described in our model, had a different character. Instead of outsourcing organizational activities, which usually happens when organizations concentrate on core competencies, IBM has acquired new organizational competencies (Lotus, Tivoli). Only the element of power at the end of the chain cannot be fully recognized in the case of IBM. IBM still has a great deal of channel and brand power, because of its size in turnover, its global coverage and the many in-house specialties. For one-of-a-kind products and high-service products this is very important. This power position is in line with IBM's core capability. For commodity products, on the other hand, IBM has experienced growing power of customers, because of their experience with commodity IT products, like PCs. IBM also has experienced the growing power of organizations downstream the chain because of the importance of their mind and space share, and their influence on the customer.

In IBM's channel design we recognize all the elements we described in the framework. Especially for commodity products IBM strongly feels the need to partner within the channel to meet customer needs, but partnering is increasingly becoming important for service oriented products as we can recognize in targets set for business done through Business Partners.

We did find part of the patterns of knowledge sharing we expected in our theoretical framework, but the knowledge sharing is primarily initiated by IBM and the knowledge is mostly distributed from IBM to its partners. One could speak about one way knowledge sharing. Skill Management and Search4Solutions however provide in sharing business partner's functional and operational knowledge with IBM (and other Business Partners). PartnerInfo does not seem to be designed to share Business Partner's contextual knowledge with IBM. This could be explained by IBM's outstanding market research facilities by which contextual knowledge is built continuously.

Conclusions and Recommendations for further Study

After having applied the framework on a first case we can draw some conclusions on the applicability of the framework. The framework looks promising and provides a good starting point for studying knowledge management in channel management although generalization based on one exploratory case study is of course impossible.

We recognized the environmental factors in our framework which create the need for hybrid channeling in the case of IBM. We defined effective partnering as
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inherent to hybrid channel designs. Different partnerships can be formed when different compositions of the channel are needed. A hybrid channel design with inherent partnering is well recognized at IBM where partnering is formalized in the Business Partner Charter and the method Routes-to-Market is used to plan the composition of the channel. Knowledge sharing from IBM to its Business Partners is regarded very important, but the sharing of knowledge from Business Partners to IBM is less well developed. IT is a powerful tool to improve knowledge access through ‘Yellow Pages’ functionality and for the sharing of explicit knowledge. It enables organizations to work in networks and acquire knowledge at great distance. In the case of IBM we saw that PartnerInfo is a powerful tool to support Business Partners to sell IBM products, through sharing of knowledge and ‘Yellow Pages’ functionality. PartnerInfo has three functions in knowledge management: assistant, librarian and some teacher functionality, of the fourth function in our framework we didn’t find evidence.

Overall the theoretical framework could be recognized in the IBM case. Different from the framework was the small amount of contextual knowledge that is shared from Business Partners to IBM, PartnerInfo doesn’t support this kind of knowledge sharing. Our explanation is IBM’s outstanding market research facilities by which contextual knowledge is built continuously so there is no need to share this kind of knowledge from partners with IBM, but the framework might need correction at this point. To conclude on this further study is recommended.

Another interesting subject for further study is the importance of commodity products for channel design. In the case of IBM we signaled the framework especially complies to channels of commodity products. The power is shifting towards the end of the chain because of the knowledge ability of customers. There might be a pattern in which power is shifting toward solution providers in the case of customized products and to buyers in the case of commodity products.

Further research is needed on how the environmental factors result in different channel configurations and on completeness of these factors to be able to generalize. Furthermore insight is needed in the effect of hybrid channel configurations on environmental factors (‘enactment’ by channel strategy).

We chose to study knowledge management in channel management from the perspective of the channel and information director. We made that choice because IT supported knowledge management is quite a new concept in business, let alone in channels. As knowledge management matures and becomes widespread, further study can be done with different partners in the channel being the research object. Within these studies the proces / learning aspects of knowledge management could be studied.

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