**KNOWLEDGE GAPS, BROKERING AND LEARNED IGNORANCE:
THE NOVO WAY OF MANAGEMENT***

Claus Rerup**

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** University of Pennsylvania, The Wharton School, Sol C. Snider Entrepreneurial Research Center, Vance Hall 4th floor, 3733 Spruce Street, Philadelphia, PA 19104, USA. Email: rerupc@wharton.upenn.edu or crerup@hotmail.com

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ABSTRACT

Based on an inductive study of The Novo Group, a focused healthcare and bio-tech company, this paper describes the corporate-level processes by which a large firm reconfigures its systems for managing what it doesn't knows. I offer a view of Novo as a dynamic wep of *knowledge gaps* and focus on the brokering processes that not only create, but also bride these gaps. In addition, I track the actions leading to the development of a new corporate system called The Novo Way of Management. This system tries to manage knowledge gaps in the internal and external environment. I detail the micro-sociological patterns by which the Novo Way of Management deals with knowledge gaps and then theorize about an organizational attitude, termed "Learned Ignorance," in which these processes are embedded.

INTRODUCTION

A central theme in the literature on knowledge management is how organizations and their participants become better at exploiting what they already know as well as exploring what they don't know (March, 1991; Tsoukas and Vladimirou, 2001). A growing number of studies are examining knowledge exploration and -exploitation by studying transfer and –sharing of knowledge (Shan, Walker and Kogut, 1994; Argote, 1999; Ahuja, 2000). This line of research is contributing exciting insights into the management of knowledge, but several issues remain. First, most of the existing research on knowledge management has focused on knowledge exploitation by assuming that organizations have perfect rather than incomplete knowledge, i.e. they know what they know (Ebenbach and Moore, 2000). But recent studies of knowledge replication underline that most firms actually don't know what they know (Szulanski, 1996; Winter and Szulanski, 2001). As to how firms deal with what they don't know little help can be found in the economic literature because this stream of research largely overlooks this topic (Smithson, 1989; Loasby, 2000).

Second, but network scholars have studied knowledge imperfections by highlighting the role 'brokers' play in bridging knowledge gaps (Burt, 1992; Hargadon and Sutton, 1997). According to Tsoukas (1996) knowledge is dispersed and thus can "never exist in concentrated or integrated form, but solely as dispersed bits of incomplete … knowledge which all the separate individuals possess" (Hayek, 1945: 519). Knowledge gaps and thus brokering opportunities emerge when disconnections exist between dispersed subgroups in a larger network. Actors filling these gaps are brokers who benefit by transferring information and resources between disconnected groups. Brokers are important because the disconnected sub-groups are linked only through these central

players. As a result, the broker is "assured of being the first to see new opportunities created by the needs in one group that could be served by skills in another group" (Burt, 1992: 70). But most of the authors that focus on brokering concentrate on the benefits, while overlooking the costs of this activity (Gabby and Leenders, 1999). This focus has created an overly optimistic vision of brokering and neglected that brokers also are information filters, gatekeepers, and perhaps self-serving individuals. For example, Hargadon and Sutton (1997) highlighted the process by which brokers benefit from disparities in the level and value of particular knowledge held by different groups, but they did not show how brokers also create knowledge gaps by filtering or keeping knowledge to themselves. Third, little is known about the decisions that cause organizations to suddenly and systematically focus on what they don't know i.e. by promoting a special set of brokers whose task is to discover and bridge knowledge gaps that would otherwise be overlooked.

In this paper, I explore the above gaps in the knowledge management literature by focusing on the corporate-level processes by which The Novo Group, a focused healthcare and bio-tech company, reconfigured its system for managing what it doesn't knows. The interest in this topic materialized when The Novo Group was dealing with the "Food and Drug Administration (FDA) crisis." An informant described the emergence of the FDA-crisis in the following way:

> "There existed broad knowledge across Novo about [that during 1991 and 1992 the interpretation of 'good manufacturing practice' was changing at FDA]. **But for some reason** management did not act to respond to this development. Novo Nordisk continued to manufacture drugs by following its own standards. In retrospect I realized that the professionals [scientists] were aware of the situation, but they were unable to make people listen. The responsible top management team should, of course, have realized that if we did not immediately change this practice – modify the production equipment and build new factories – things would go wrong at the next audit. But management did not react. … The auditors discovered so many problems that they

thought it were enough to close the company. This fact, of course, initiated a sense of crisis" (Henrik Gürtler, CEO, Novo A/S in Jacobsen, 2000: 212-213. Bold added).

Millions of FDA-regulated products –medications, medical devices, and veterinarian products – consumed or used in the U.S. are produced abroad. To protect the health of American consumers, "FDA's specialists inspect foreign facilities that export food, medication and other critically regulated products to make certain that they follow quality-enhancing good manufacturing practices" (FDA Publication FS 01-12). FDA is a very powerful agency because if it bans a product from being sold in the U.S. agencies in other countries are likely to inspect the product as well. Being blacklisted by FDA is bad news for business. In this context, why did Novo Nordisk fail to respond to the new FDA regulations? Why did top management remain passive? Why did the knowledge about 'good manufacturing practice' fail to travel from the professionals to top management? In the early 1990s Novo was a very hierarchical organization. So, in order for this information to travel from the bottom to the top of the organization it was necessary to involve middle management. Put differently, no direct ties existed between the top and the bottom of the organization. Transfer of knowledge involved a group of middle management located in a central brokering position and with their own agendas. As a result of this organizational design as well as conflict of interests emerging from a merger (see later), middle management filtered the information from the bottom so much that the new regulations did not set off alarm bells or did not reach the top.

To prevent similar knowledge gaps in the future a new corporate system called The Novo Way of Management (NWM) was developed. The aim of this system was to create opportunities for information to by-pass middle management. The idea was not to marginalize middle

management. Rather, the idea was to minimize the potential downsize of their central brokering position. Specifically, the aim was to build direct ties between top-management and a range of internal and external stakeholders by: 1) creating a stakeholder relation department and 2) hiring a group of brokers called "facilitators." The aim of each of these initiatives was to 1) detect and manage knowledge gaps, 2) acknowledge the costs and benefits of knowledge imperfection and 3) create variation in knowledge flows and interpretation. Generally, top-management wanted a system that created different opinions about what was going on in the organization. Variation of opinion is necessary in any system. As Simon, Egidi, Marris and Viale (1992: 21) have observed, "any direction you proceed in has a very high a priori probability of being wrong; so it is good if other people are exploring in other directions – perhaps one of them will be on the right track."

By stretching a set of ideas originally developed by Nicholas of Cusa (1990(1440)), I show how the NWM is embedded in an attitude called "Learned Ignorance." This attitude is a predisposition to think and act by admitting that perfect knowledge is non-existing while believing that knowledge gaps also can be detected and managed. Detection is achieved by actively, constantly, and critically questioning existing successful practices. It involves treating knowledge that worked in the past with humility. It means being neither too arrogant about the value of new insights nor too insecure about the value of existing insights (Meacham, 1990). Hereby the organization becomes less myopic, more reflective and allows conflicting perspectives to co-exist. This diversity combats inertia (Leonard-Barton, 1992) and competency traps (Levinthal and March, 1993) and helps to detect flaws in network connections, structures, processes and practices. On closer inspection this reflection helps the organization to detect

some, but not all unnoticed knowledge gaps. If an organization can develop this kind of

knowledge it will attain Learned Ignorance. Nicholas of Cusa explains:

> "For a man – even one very well versed in learning – will attain unto nothing more
> perfect than to be found to be most learned in the ignorance which is distinctively
> his. The more he knows that he is unknowing, the more learned he will be "
> (Nicholas of Cusa, 1990: 6).

Learned Ignorance means, primarily, an ignorance that someone has come to learn of, and,

secondarily, an ignorance, which renders its possessors wise and humble (Hopkins, 1990: 56).

By developing this attitude an organization acknowledges that it is ignorant, which is not the

same as saying that it does not know anything. An organization knows many things even if it

does not attain perfect knowledge about own operations, capabilities and markets. In short,

Learned Ignorance means acknowledging that the more we think we know the less we actually

know. Acquiring Learned Ignorance is a dynamic process. It consists of turning an unreflective

practice into a reflective one by giving shape to collective understandings, by hiring brokers that

actively detect and bride knowledge imperfection, and by promoting a set of shared behaviors

that guide pooling of unshared information. Below, I develop a relatively full explanation of

Learned Ignorance in one company, which is then used to guide general discussion about

knowledge gaps, brokering and ignorance in other settings. As is typical of qualitative research,

my account begins with a description of my theory building methodology. Then I present the

results that empirically ground my process theory. The paper is closed with a discussion.

METHODS AND DATA

Research setting

The Novo Group consists of a holding company, Novo A/S, and two individually managed

companies: Novo Nordisk A/S and Novozymes A/S that follow the governance principles stated

in the Novo Group Charter (core values, commitments, management principles), including the NWM. The history of the company goes back to 1921. Novo Nordisk was created by a merger between two leading Danish pharmaceutical companies in 1989: Novo Industri A/S and Nordisk Gentofte A/S. Novo Nordisk A/S became a focused healthcare company on November 14, 2000 when Novozymes was established by means of a demerger from Novo Nordisk A/S. With the broadest diabetes product portfolio in the industry, Novo Nordisk is the world leader in diabetes care. Novo Nordisk employs 16,200 people and has production and/or sales offices in 68 countries. The net turnover in 2001 was $2.8 billion. Novozymes is a world leader in enzymes. The company supplies enzymes to three industrial sectors: technical enzymes (used in the detergent, starch and textile industry), enzymes for the food industry (e.g. for baking and brewing) and enzymes for the animal feed industry. Novozymes employs 3,500 people and has production and/or sales offices in 21 countries. The net turnover in 2001 was $600 million.

Method

The design of the study follows established conventions for doing qualitative research (Yin, 1989; Eisenhardt, 1989). This method allows for a close correspondence between theory and data, a process whereby emerging conceptual insights are tested and grounded in data. The unit of analysis was the emergence and function of the Novo Way of Management across the Novo Group and its relation to Learned Ignorance. To develop my theory about Learned Ignorance, I was building on the findings from the case study and the literature on brokering in social networks (Burt, 1992; Hargadon and Sutton, 1997). The research design was deductive in the sense that the Novo Group was theoretically sampled. But the design was simultaneously inductive in the sense that I was explorative in my data collection. For example, when promising

themes like humility and wisdom emerged, I focused the data collection on them, read pertinent literature, and did preliminary analyses to decide if they were worth pursuing. By combining descriptive concepts in the data with theoretical concepts from the literature I created a process model that explains how the Novo Group developed and maintains Learned Ignorance.

Data collection. This paper is the result of a 15-month field study of the NWM. The data was collected during eight one-day visits. The data collection was focused on 10 of the leading individuals involved in developing and maintaining the NWM. While collecting the data, I tried to be critical towards the success experienced by the Novo Group. For example, over the past 10 years, the annual growth in operating profit of Novo Nordisk and Novozymes has been fluctating between 10-25%. In light of these results all of my informants were reflective about the danger of success. They spoke openly about the good and bad experiences characterizing the history of The Novo Group. For example, they used words like "arrogance," "incompetence," and "overconfidence" when mentioning the actions that caused the FDA-crisis. To remain as analytical as possible, I collected data from multiple sources (Miles and Huberman, 1984). Gathering evidence from multiple data sources addresses potential problems of construct validity. For example, by providing multiple measures of the same phenomenon. The logic behind this method is that by looking at the convergence between multiple, independent observations it is possible to build stronger support for emerging findings. The evidence guiding my descriptions of and inferences about knowledge gaps, brokering and Learned Ignorance came from four general sources:

Semi-structured interviews. I conducted 12 semi-structured interviews; 10 where tape-recorded and transcribed; I took notes during others. The interviews lasted between 45 and 120 minutes. A total of 14 hours of conversation and 200 pages of raw text were transcribed. I conducted one interview with eight persons all of which where either department managers or vice-presidents. In addition, I did four interviews with Henrik Gürtler, CEO Novo A/S. The first two interviews with Gürtler were not taperecorded. My informants were between 38 and 55 years old, Caucasian, and had completed a master degree. Three of the informants did also have a Ph.D degree. Eight interviews were completed with men and four with women. The informants read and approved the respective interviews. In this process misunderstandings and imprecise language was corrected.

Seminar participation. I participated in a two-day seminar with 30 employees from Stakeholder Relations, the department that organizes all environmental and social reporting in the Novo Group. The seminar was part of the departments internal educational program and was located at a hotel where the participants stayed overnight. The seminar was a mix of group work and presentations by guest speakers, focusing on upgrading the participant's knowledge about "Corporate Social Responsibility." The seminar provided an excellent opportunity for collecting data in the sense that issues such as the culture, structures, practices, successes and failures across the Novo Group were discussed. These issues emerged because each group was discussing concrete "Novo topics", i.e. The FDA-crisis, genetic engineering and intellectual property rights and patenting. The discussion highlighted knowledge gaps, brokering situations and ways of dealing with issues and potential problems emerging from knowledge imperfection.

To recall specific events, comments and reflections from the discussions I took notes, as the situation permitted.

Informal conversations. Any visit to Novo entailed unplanned conversations. Many of the 30 employees in Stakeholder Relations, where I was provided an office during my visits, were curious about the research. The building where Stakeholder Relations is located has a large café area, which further encourages informal talk. In fact, I did not spend much time in the office. It was more fun and enlightening to hang around in the café. As a result, I had many informal conversations with employees and managers, including those that took place during the seminar. In addition, during my visits I ate lunch with people from Stakeholder Relations and other departments. During lunch we talked about my research, especially about HRM-policies, communication strategies and brokering. I took notes as the situation permitted.

Materials about the organization. I collected 67 stories about The Novo Group from various sources, including Fortune, the American Diabetes Association, Danish and European business magazines as well as a wide range of international newspapers. I also collected 1,500 pages of other materials produced by and about The Novo Group, including annual reports (1980-2001), environmental and social reports (1995-2001), Charter for companies in The Novo Group, internal employee magazines, internal correspondence and the implementation manual for The Novo Way of Management. The book mads@novo.dk (Jacobsen, 2000) was also a useful source of information. In addition to these materials, I also downloaded 1,050 pages of documents from the FDA homepage to understand the regulatory changes that occurred in the 1990s.

Data analysis. Data analysis used familiar approaches (Miles and Huberman, 1984; Eisenhardt, 1989). Analysis began by contrasting available accounts of the FDA-crisis (Jacobsen, 2000) and my own data. I first sampled on variations and similarities across accounts, which were the basis for developing early constructs about knowledge gaps, brokering and Learned Ignorance. I then schematically traced, by make a simple time line, the major events, incidents and decisions, i.e. merger, demerger and accidents that occurred in the history of the Novo Group. I then, as a result of data availability, focused on the period from 1980-2002 by extracting characteristics such as firm values, mindsets, cultures, structures and behaviors from the data. I focused on these characteristics because I wanted to understand how and why the development of these firm characteristics was related to the FDA-crisis, the advance of the NWM and Learned Ignorance.

A PROCESS MODEL OF LEARNED IGNORANCE

The data indicate that it was not until the FDA-crisis occurred in 1994 that the Novo Group started to develop Learned Ignorance. While developing his logic, Nicholas of Cusa (Cusa, 1990; Hopkins, 1990) was focusing on how individuals could develop Learned Ignorance. Here I stretch Cusa's reasoning by assuming that collectives like organizations also can develop Learned Ignorance. Below I ground this and other assumptions in data. But unlike Cusa, who believed individuals would develop Learned Ignorance proactively, I assume that firms develop Learned Ignorance re-actively because they learn from experience.

Experience that leads to success is remembered, repeated and reinforced, while experience that causes failure is discarded (Cyert and March, 1963). Organizations therefore tend to build experience within domains where they are successful. As a result of this insight, a number of

classic studies (Starbuck, 1965; Thompson, 1967) assume that organizations over time develop

deep knowledge about what they know and do. These studies also assume that by paying

attention to what they know firms will automatically be able to deal with what they don't know.

In this paper, I argue instead, by building on a set of conceptual (Levinthal and March, 1993) and

empirical studies (Leonard-Barton, 1992; Miller, 1994), that organizations and their participants

gradually develop myopic and flawed knowledge about what they know and do. As a result of

not noticing these flaws and gaps, they continue to act as if they had perfect knowledge until

experience teaches them expensive lessons about arrogance and knowledge imperfection. An

informant explained:

> "Before taking this job, I was managing around 500 people for many years. While
> being in that chair I was quite sure that I knew what was going on. For example, the
> problems we were facing and the solutions available. But today I realize that I was
> wrong. I was more or less aware of the threats in the external, but not the internal
> environment, because internally there were so many filters that prevented me from
> getting the right knowledge. In my new job, I have realized that if you can know what
> people three layers down in the hierarchy are talking about over lunch, you are much
> better equipped as a manager. … The NWM is a system that tries to generate this type
> of knowledge."

Developing insights about knowledge gaps, -filters and -flaws require a certain degree of "double

loop learning" (Argyris and Schon, 1978), "wisdom" (Weick, 1998), humility (Szulanski and

Winter, forthcoming) and "mindfulness" (Weick, Sutcliffe and Obstfeld, 1999). These cognitive

and behavioral patterns identify imperfections in knowledge that unfold when information is

actively ignored or accidentally overlooked (Smithson, 1989). Identifying and pooling unshared,

relevant information between two agents or groups (Stasser and Vaughan, 2000) is difficult and

may require the involvement of a third party, i.e. a broker. A broker may ask critical questions

and thus identify topics or issues that the organization should know but doesn't know about.

Uncovering this imperfection translates into action or activities that bride or manages the

identified knowledge gap. A specific form of cognition and action that generates reflection and motivates participants to actively search for such gaps therefore characterizes organizations with Learned Ignorance.

The FDA-crisis

The FDA-crisis did not emerge because there was anything wrong with the product (insulin). Rather, Novo Nordisk was simply unable to document that the company was complying with FDA's standards for "current good manufacturing practice" (CGMP). FDA issued its first rules about CGMP in 1978. Up until 1990 the law was not revised. However, irregularities in FDA's practice during the 1980s forced the U.S. Senate to do something. The Safe Medical Device Act of 1990 amended the law. Over the next 7 years FDA significantly changed the CGMP regulation. For example, to include requirements to document the methods and standard operating procedures "used in, and the facilities and controls used for, designing, manufacturing, packaging, labeling, storing, installing, and servicing medical devices intended for human use" (Federal Register, Vol. 61 (No. 195), October 7, 1996/Rules and Regulations).

During an FDA inspection in 1994 at Novo Nordisk, the auditors discovered more than 100 incidents of non-compliance with the amended CGMP regulations. As a result, Novo Nordisk was at risk for being suspended from selling its products on the American market. Based on this risk, top management communicated to FDA that the past six moths of production would be discarded and that new quality and process documentation systems would be implemented. The decision to discard six months of production incurred a loss around $50 million, lost revenues and tumbling stock market prices. The decision also clearly underlines why it may pay off to

develop Learned Ignorance. The loss of money was important. But more seriously, discarding six

months of production meant that Novo Nordisk was unable to deliver insulin to its customers.

Top management contacted Eli Lilly, the largest competitor, and asked if Eli Lilly was interested

in helping. Of course, Eli Lilly accepted the proposition. It is not every day that your competitor

calls to hand over 45% of the market free of charge. To prevent similar events in the future the

NWM, with its focus on knowledge gaps and brokering, was implemented during 1994-2000

because "this was just the last, the only thing, that *was not* to happen" (CEO Novo A/S, Henrik

Gürtler in Jacobsen, 2000: 213. Italics in original). Specifically, my data suggest that The Novo

Group's current interest in and ability to manage knowledge gaps can be understood by

considering the organization's socio-cognitive mindset or vision, the structural network position

of a relatively small group of brokers, and the behaviors of all other employees to exploit the

knowledge generated by these brokers.

INSERT FIGURE 1 AROUND HERE

Figure 1 summarizes the relationship between the socio-cognitive, structural and behavioral

elements of Learned Ignorance in a four-step process model. *Vision* (step 1) describes how the

FDA-crisis caused the development of the NWM and details the socio-cognitive mindset that

supports an active interest in managing flaws and ignorance. *Detection* (step 2) describes how a

small group of brokers actively try to detect knowledge gaps internally within The Novo Group

and externally between stakeholders and the organization. But the way these knowledge gaps are

managed to prevent future situations like the FDA-crisis depends on how the rest of the

organization bridges these gaps. The remaining two steps of the model describe the behaviors

that help The Novo Group to manage knowledge gaps before they turn into problems. *Learning* (step 3) describes how the brokers help the organization to manage knowledge gaps and store the insights generated in the process. *Storage* (step 4) describes how the insights remain in memory and helps to preserve a sense of urgency and legitimacy for maintaining a future focus on what the organization doesn't knows. The outcome of this four-step process model is Learned Ignorance. The model presents vision, detection, learning and storage as linear and distinct phases. However, the process was not always as linear as the model implies. Rather, my analysis of the data indicates that the steps were often overlapping.

I used an iterative process to develop the inferences about the process of Learned Ignorance summarized in Figure 1. Relying on established qualitative methods (Miles and Huberman, 1984), a set of iterations usually began with a hunch inspired by the data or literature e.g. I tried to see if Burt's (1992) notion of brokering could explain the role of "facilitation" in the NWM. Then, to see if the hunch could be grounded, I searched all four data sources for evidence e.g. I realized that it was useful to focus on brokering. These analyses made me abandon, modify or maintain each inference. Following established data display techniques (Hargadon and Sutton, 1997), I summarized the grounding for each inference in a matrix reflecting how strongly each inference could be grounded in each data source. I then wrote up my inferences about each retained step in the model, weaving together conceptual arguments, additional evidence, and citations to relevant literature. Table 1 presents the evidence that grounds my process model of Learned Ignorance.

INSERT TABLE 1 AROUND HERE

Step 1: Vision – Socio-cognitive element of Learned Ignorance

My analysis of the data shows that the emergence of the FDA-crisis was linked to an arrogant, overconfidence in the value of existing practice. Arrogance unfolds by overlooking, misunderstanding or ignoring certain aspects of reality. An arrogant organization believes that it has perfect knowledge and thus knows what it knows. But as Bronowski (1953: 53) has noted: "There is no absolute knowledge. And those who claim it … open the door to tragedy. All information is imperfect. We have to treat it with humility." But across the Novo Group a history of success did not provide for humility. An informant explained:

> "During the 1980s we experienced tremendous success. But the fatter an organization becomes the harder it is to detect new signals. We experienced limited competition and everything was fine. As a result of this situation we were not paying particular attention to the [signals from FDA] in the early 1990s."

Another informant continued:

> "We were suffering from the 'World Champion Syndrome.' That is, overconfidence, self-sufficiency, a sense of closure towards the environment, ignorance internally in the organization and a feeling among the employees of being best."

Success was not the only reason that distracted the socio-cognitive detection of signals. The data also indicate that the merger between Nordisk Gentofte A/S and Novo Industri A/S in 1989 distracted the outlook of the organization. Although the merger is not the main topic of this paper, a few comments are necessary. Previous research has suggested that post-merger integration success is highly dependent on how well the tasks and the human capital from the merging companies are integrated (Berkinshaw, Bresman and Hakanson, 2000). Research also indicates that it is not uncommon during mergers that conflicts of interests develop between different 'cultures' (Datta, 1991). These issues were also present at Novo. The cultures in the two companies were different. Nordisk was characterized by an autocratic style of leadership and was

very fast in making decisions. Novo was process oriented, focused on consensus and slow in making decision.

Following the merger a process was initiated to determine the values and principles that should characterize the new Novo Nordisk. Consensus became one of the key values. As a result, conflicts were not allowed, which prevented discussion, openness and contrasting opinions from flowing. An informant continued:

> "Management used its energy to turn the merger into a success. Success meant that there could not be any open conflicts. So, during several years no major conflicts occurred in the open. This was dangerous because in the production we noticed that the regulatory demands, especially demands from FDA, were increasing. We also noticed that we were on a treadmill and that our compliance decreased as a result of increasing demands to deliver. We could not discuss this problem with top management because conflicts were not allowed. The signal from management was that either you agree or its out. … When top management finally realized what was going on the problem was so big that they believed the survival of the company was in danger, i.e. that FDA would close us down."

On the 'shop floor' a number of very skilled people knew that something was wrong with the quality- and validation systems. These people participated in several conferences in the U.S. where the new rules from FDA were discussed among specialists. Around 1990-91 the specialists realized that Novo Nordisk's production facilities were inadequate and in conflict with the new FDA regulation. They wrote a number of internal reports, concluding that it was necessary to upgrade The Novo Group's validation processes and quality control. In addition, they wrote that a number of the existing production facilities in their current form could not be upgraded to comply with the new FDA regulation. Henrik Gürtler, CEO Novo A/S, continued:

> "It was necessary to build new production facilities, new factories, but very little happened. These processess came to a stop at different levels in the organization. I can not tell if it was caused by incompetence among the management or communicative inertia. The embarrasing fact is that the work, which was clearly

necessary, did not happen. A number of critical applications for invesments were not approved. They were sitting with management and simply collecting dust."

With these comments in mind, I conclude that top management was ignorant about the necessity for building new production facilities because 1) they had created a post-merger environment where conflicts were not allowed and 2) middle management was filtering this information away.

More specifically, the data support this conclusion in two ways. First, "there was a layer of arrogant middle managers that assumed they knew what top management needed to know" (Vice-President). These middle managers were inert (Bower and Christensen, 1996) and did not listen to the specialists. As a result, middle management did not pay attention to the signals indicating that change was necessary. Top-management did also not pay attention because there simply existed no direct ties between the top and the lower levels of the organization. "Before the FDA-crisis all information traveled from one level to the next in the hierarchy. There was no by-pass or other route in the system" (Department Manager). As a result, middle management was located in a strong brokering position. Second, the strong signal from top-management about disallowing open conflicts motivated middle management to filter the information from the bottom. After reorganizing the organization as a result of the merger, a number of middle managers became redundant and those who remained were well aware of what top-management wanted to hear. Namely, that there were no conflicts and problems in the organization.

In sum, the merger created a layer of middle managers that not only filtered the data because they were arrogant, but also because they wanted to comply with the guidelines issued from top management. As a result, top management was unable to access a sample of unfiltered "raw data" describing what was really going on in the organization. Henrik Gürtler continued:

"In a large organization ... where politics matter ... it is dangerous to send information over long distances ... because in the process it is simplified, digested, reduced and twisted. ... You can only rely on this information if you are naive. The FDA-crisis tought us that it was necessary to develop a system that gives top managment and the entire management system an unbiased second or third opinion."

Following top managements discovery of the FDA-crisis in 1993-1994, Henrik Gürtler, who at that time was HRM-Manager, was given a Carte Blanche from top management to develop a new management system that would prevent similar incidents. Gürtler and his staff discovered that there existed a myopic, arrogant mindset across The Novo Group. The existence of this mindset was related to the success experienced by both Nordisk Gentofte A/S and Novo Industri A/S. Prior success made a large part of the organization overconfident in the competence and adequacy of existing practice, preventing self-criticism and reflection to travel across the organization (see quotation in table 1). As a result of this mindset and related practices, important information was misunderstood, filtered or ignored. Gürtler concluded that to by-pass this mindset it was necessary to build new cultural values and practices and to start sharing information in completely new ways. This insight initiated the development of "The Charter for Companies in The Novo Group" and the NWM. Tabel 2 summarizes the NWM and describes the basic values, commitments and principles that companies in the Novo Group should maintain.

INSERT TABLE 2 AROUND HERE

Based on the NWM, The Novo Group is committed to the concept of the "triple bottomline." This means that a company should not only be financially viable but also environemntally and socially responsible. To ensure that companies comply with The Charter and the NWM, Novo A/S, the holding company, "uses six specific follow up methods to provide systematic and

validaded documentation of performance: 1) financial follow-up and reporting, 2) environmental & bioethics reporting, 3) social reporting, 4) organizational audits, 5) succession management, and 6) facilitations" (The Facilitation Process, Version 4, February 2001). In this paper, I focus in particular on facilitation (6). An informant continued:

> "The Facilitators are trained to get people talking. "Tell me what you do", they ask. "Describe your daily work activities." "How does the communication function here?" "Do you think something inappropriate is going on or are there things happening that you don't approve off?" They ask all these open questions to identify business procedures or processes that are ineffective or perhaps unknown by management. The Facilitators try to identify **disconnections between what management believe or think is going on and what is actually occurring**."

Edigi (1996) also noted that decision makers usually do not possess precise and detailed knowledge of reality. Rather, they usually have only incomplete and biased knowledge.

Step 2: Detection of knowledge gaps – Structural element of Learned Ignorance

Figure 2 summarizes the solution Henrik Gürtler and his team proposed to detect and manage knowledge gaps. The ambition of the solution was more specifically to generate a system that would help the organization to (1) actively search for second and third opinions in the internal and external environment, (2) value flexibility, responsibility, reflection and openness as well as (3) develop practices supporting knowledge sharing and continious improvement.

INSERT FIGURE 2 AROUND HERE

The FDA-crisis showed that it was necessary to listen more carefully to internal and external signals. The crisis uncovered at least three types of knowledge gaps as shown in figure 2. The first knowledge gap, Gap 1, was a direct outcome of the hierachical design of the organization. It

existed because no direct ties were in place between the top and the bottom of the organization, creating a central brokering position for middle management. More importantly, the failure of top-management to detect the FDA-crisis was related to the second and the third knowledge gap. The existence of there gaps were influenced by the ways in which decision-makers were paying attention to events (Hoffman and Ocasio, 2001). Within this view, the internal and external environment of an organization is depicted as streams of events and issues that decision-makers need to notice, classify and make sense of before action is initiated. And, as I have documented above, as a system Novo was paying attention to the critical signals from FDA. But subsequent success- and merger-biased processes of classification and interpretation lead to restrictions in information processing (Kiesel and Sproull, 1982) at various levls in the hierachy and caused top-management to misunderstand the meaning of these signals. As noted by Loasby (2000: 13), "the way in which we organize knowledge puts limits on the knowledge that we can organize." All knowledge is generated, shared and organized by using some kind of framework. These frameworks have consequenses because they consists of rules, beliefs and conventions that bias how we know and make sense of the world. As a result, our frameworks make us both knowledgerable and ignorant, and as long as we continue to classify and interpret reality by way of using certain framework, certain aspects of reality will remain unknow.

To counter-balance these knowledge gaps and the associate restrictions in information-processing a group of Facilitators were hired. The Facilitators report to Novo A/S and conduct facilitations within the Novo Group. The results produced by a facilitation will be used by the CEO of a specific unit to document to the board of directors that the company is living up to the values, commitments and fundamentals described in the Novo Way of Managment. A facilitation

can take place at different analytical levels, i.e. it can focus on the performance of a department, division, factory or geographical area. An informant continued:

> "The Facilitators are very experienced and well-respected people internally in the organization. They need to have this status because they are telling people how to run their business based on our values and The Charter. External people cannot do this. It needs to be done by someone who knows our business and has **an internal network.** … When we posted the jobs more than 120 applications arrived. We were able to hire 14 of our most experienced, well-respected and best performing managers. It means that we have about one Facilitator pr. 1000 employees."

Facilitators are normally hired for 3-5 years. They are 'on location' 120 days annually in teams of two that constantly change to combine skills and experience. They perform analysis of complex organizational problems, process flows, managerial- and cross-functional issues and provide temporary implementation support. The Facilitators conduct informal interviews with roughly 40% of the employees in a unit. By using the NWM as a benchmark, they ask a set of standardized questions.

A facilitation is not an exam but a service helping local management to identify evolving internal conflicts, flaws, knowledge gaps and inconsistencies. Every facilitation ends with a report that contains at least one action point. The Facilitators and local management agrees on a deadline where the identified improvements must be accomplished. When the deadline is over, the Facilitators return to check if the improvements were implemented. Unless issues remain to be fixed, the Facilitators issue a certificate indicating that the unit has been facilitated. Then the report is forwarded to Henrik Gürtler, CEO Novo A/S. On a monthly basis Gürtler and the rest of top management discuss the reports. "The reports give the employees an unfiltered voice that helps top management to develop a good understanding of what is going on in the organization"

(Vice-President). As a result of their unique network position, the Facilitators both generate and circulate knowledge. An informant explained:

> "Our Facilitators are everywhere; India, Russia and Brazil. When they travel **they store all these good and bad examples in their heads**. So, when they, for example, are in Russia they realize that the distribution system in Russia is not working compared to the system in India. The Facilitators become **carriers of knowledge**. For example, when they suggest that the Russian General Manager should talk to his counterpart in India. … Facilitators are change agents that really helps us **to circulate knowledge** and learn from success and failure."

Local management sometimes disagrees with the findings generated by the Facilitation. For example, in one case the findings indicated that communication in the unit was dysfunctional. The local manager suggested that the Facilitators had only talked with people who misunderstood what he said. The Facilitators turned the argument around and argued that if the employees were misunderstanding what was being said, the local manager had to solve the problem. "We did not allow this manager to preserve his arrogance. We tossed it right back in his face" (Facilitator). On other occasions, the Facilitators are asked if they can stay and solve the identified gaps and flaws. But the Facilitators will not directly work on solving the problems. Instead, they use their network "to identify and recommend whom local management should contact to get started" (Facilitator).

The Novo Facilitators are different from the technology brokers described in Hargadon and Sutton (1997) study of IDEO. Contrary to technology brokers, Novo Facilitators do not benefit from being connected in many industries. Rather, the Facilitators are connected in many networks internally in the Novo Group. For example, they know people in different functional and geographical areas as well as people across the entire hierarchy. A similarity between Facilitators and technology brokers is the way in which they generate connections between

disconnected people, choices, problems, and solutions (Cohen, March and Olsen, 1972). After having detected flaws and knowledge gaps (problems) in one part of the network, Facilitators use their brokering position to identify a starting point for managing the gap (solution) by highlighting people and choices in another part of the network. "The Facilitators both identify gaps and help to find solutions by using their connections" (Facilitator). As a result of their ability to link appropriate problems with relevant people, choices, and solutions, the Facilitators associate alternatives with outcomes. By generating these links, the Facilitators minimize the cost of information search (Cyert and March, 1963). First, by reducing uncertainty and ambiguity about *where* local management reliably can look for information, and, second, concerning *what* they need to know to manage the identified knowledge gaps (Tsoukas, 1996).

Step 3 & 4: Learning, storage and recall – Behavioral element of Learned Ignorance

Developing Learned Ignorance involves not only socio-cognitive and structural elements as discussed above, but also behavioral elements. The Facilitators work will have little effect unless they are able to involve the rest of the organization in filling these gaps. The involvement of the organization is facilitated by the organizational culture and the shared values and identity of the participants. Several of my informants explained that the Novo culture is characterized by selecting people that can behave and think paradoxically: the ability to conceive and balance two or more contradictory ideas, processes and behaviors simultaneously (Cameron and Quinn, 1988). For example, historically Novo has been able to hire some of the best people in the respective countries where they operate. But as the FDA-crisis indicated, successful individuals tend, as a result of attributing performance to internal factors rather than luck and external factors, to become arrogant and narrow-minded over time. An informant continued:

> "Today our culture tries to prevent people from becoming arrogant. It's the worst you can have in an organization because it closes off any form of innovation. With arrogance it's a matter of time before things go wrong. Sooner or later the arrogant manager will overlook something. And, since nobody dares to tell him that he is wrong or he refuses to listen things will go wrong. It's a bomb waiting to explode. … Unfortunately, arrogance is quite common in the business world. But at Novo we try hard to maintain a sense of humbleness although we are not immune."

Informal conversations, observations and participation in meetings and seminars with employees from Stakeholder Relations indicate that the culture at Novo is systematically promoting people who are outstanding, yet humble; focused, yet reflective; and bold, yet careful. An informant explained:

> "The idea behind Succession Management is to develop people so they will be able to occupy key positions in the future. We evaluate more than just their professional qualifications. We also assess if the person is open, honest and admits failures. By doing this we build a set of future leaders [at all levels] that are open towards new ideas and criticisms and thus can contribute to prevent that we get into another FDA-crisis in the future."

Succession Management sends a clear behavioral message to the people in the Novo Group. Namely, that if you want to move on and get a promotion it is important to behave in an open, honest way. The signal is also that you can be as skilled and qualified as you want, but unless you are humble and admits failures and limitations, you will not succeed in this company. These values and behavioral guidelines make the work of the Facilitators easier. It motivates local management and the people in the unit to be open and honest about things that are not working. Indeed, it makes them receptive to implement suggested improvements.

The behavioral implications of Succession Management, especially the ways in which it reminds people about the FDA-crisis suggests that Novo has a memory (Olivera, 2000). For example, in the context of the FDA-crisis an informant indicated: "What is most feared across Novo today is that we find ourselves in a situation, a crisis situation, where we are unprepared." Based on my

visits to the Novo Group I discovered how the lessons learned from the FDA-crisis circulate via the Novo culture. These lessons travel as stories or narratives and remind the organization about maintaining Learned Ignorance. For example, many stories are told about how Mads Øvlisen, the former CEO of Novo Nordisk, was "chocked and that he did not know who he could trust when the FDA inspectors told him that most of his people were incompetent" (Department Manager).

Henrik Gürtler and his team were well aware of the power of these stories. As a result, sharing of best-practice became an integrated part of the Novo Way of Management. An informant explained:

> "Every General Manager must be able to document that s/he is buying and selling three best practices every year. It is easy to buy three best practices, but it is much harder to sell. You need to convince your colleagues that you are doing something really smart and that they will be able to benefit from adopting your practice."

To further facilitate the exchange of 'best-practices' as relevant solutions to identified knowledge gaps and flaws, the Novo Group established a number of databases during the early 1990s. The idea was that via the intranet the General Managers would be able to codify, circulate and learn from best practices. Although the idea is noble it did not work. Consistent with findings in the literature on replication of knowledge (Szulanski, 1996; Winter and Szulanski, 2001) it was simply too difficult for the General Managers to codify the best practices.

DISCUSSION AND CONCLUSION

This study identified the factors that permitted the Novo Group to develop a system for managing what it doesn't knows. Little empirical work has tried to weave together a perspective on ignorance (knowledge gaps) and reflection with the costs and benefits of brokering to describe the role of Learned Ignorance in organizations. In this study, I developed such an

integrated perspective in a process theory by describing the specific practices that maintain Learned Ignorance across the Novo Group. The process model was developed through inductive analysis of interviews, seminar participation, informal conversations and archival data and was focusing on the socio-cognitive, structural and behavioral elements of Learned Ignorance. The purpose of studying the Novo Group was to show how successful companies become better at exploring and managing what they don't know by developing Learned Ignorance. The importance of generating this insight is supported not only by Winter and Szulanski (2001) who claim that most firms actually don't know what they know, but also by James Fredrick Ferrier, a professor of moral philosophy at Oxford University, who more than 150 years ago invented the word *epistemology*, or Theory of Knowledge (Ferrier, 1854). He argued that to be of any use this theory would have to be supplemented by *agnoiology*, or a Theory of Ignorance. Unfortunately, the latter has been largely overlooked among strategic management and organization theory scholars.

A simple search in a database such as Prorequest supports that the study of "ignorance" is not part of any standard theory of organizations. In existing research, scholars almost always focus on the management of knowledge rather than ignorance. As a result, researchers have mostly been focusing on what organizations know, rather than on what they don't know. This focus can be problematic because my findings indicate that by paying attention to what it knew, the Novo Group was focusing on what it was doing successfully, while ignoring what it did less well. This split of attention established the myopic belief that Novo had acquired perfect knowledge. The reaction to the FDA-crisis suggests that this belief was maintained until the FDA inspectors revealed the cost of sustaining such arrogance. These results support the proposition that

knowledge management processes are incomplete and superstitious (Lave and March, 1975), cause persistence in non-optimal practices (Levinthal and March, 1993) and lure organizations to think that they know more than they do. By focusing on knowledge gaps and brokering my study of the Novo Group takes important steps towards establishing an empirical foundation that is currently lacking in the literature. This foundation describes the decisions that motivate the development of the practices that sustains the socio-cognitive, structural and behavioral elements of Learned Ignorance. I discuss below how the three major elements of my process model of Learned Ignorance relate to current research on corporate governance and collective mind, garbage can decision processes, and organizational learning in organizations. I concluded this section with a consideration of research limitations and implications for future research and practice.

Socio-cognitive element of Learned Ignorance: Governance and collective mind

My theory of Learned Ignorance emphasizes the role governance structures and collective mind plays in managing knowledge gaps. Increased research attention is being devoted to the influence of corporate governance on important organizational outcomes (Carpenter and Westphal, 2001; Wolfe and Putler, 2002). Corporate governance means a set of goals, principles and values according to which a company is managed. These characteristics establish a framework that advice and regulate interaction among the company and its stakeholders. The Charter for firms in the Novo Group including the Novo Way of Management (see table 2) is an example of such a framework. Corporate governance and stakeholder theory is related to the concept of "stake" or "interest" (Freeman, 1984: 60). A concern in the literature is how different stakeholders prioritize and support a certain issue or topic considered relevant by the leadership of the

organization (Rowley, 1997). The FDA-crisis was an identity forming moment for many of the stakeholders of the Novo Group. It created a myth and a homogeneous interest among all stakeholders, especially the employees to prevent similar incidents in the future.

Current research directs attention to the potential importance of identity forming moments and the related outcome of well-developed, shared mental models. As mentioned by Bigley and Roberts (2001: 1295), "'understanding' or 'awareness' can be usefully conceptualized as a group-level phenomenon, and 'cognition' occurs not only within individuals but also between or among them, as a function of the quality of the connection or interactions they are able to accomplish with each other." My analysis of the Novo Way of Management indicates how a set of corporate governance principles, a group of Facilitators, and a culture that supports knowledge exchange and humility can improve the quality and interaction among employees and lead to a direct appreciation for detecting flaws and knowledge gaps. Weick and Roberts (1993) suggested that "collective mind" is present when organizational members "heedful" interaction links dispersed bits of task related know-how in such a way that situational demands are met. From this perspective, the people across Novo have developed a collective mind because they exchange and link information to bride knowledge gaps. A unique feature of this exchange is the way in which a set of Facilitators deliberately tries to improve the quality of the collective mind by way of brokering.

Structural element of Learned Ignorance: brokering and garbage can decision processes
Existing research has mostly focused on the benefits of brokering, while neglecting the costs (Gabby and Leenders, 1999; Ahuja, 2000). However, my study indicated that brokering involves

both costs and benefits. For instance, before the FDA-crisis the middle management at Novo was not only bridging, but also generating knowledge gaps by ignoring, filtering and biasing information. The logic behind hiring 14 Facilitators was to reduce the brokering power of middle management and generate more variation in knowledge flows. These results underscore the relationship between brokering and garbage can decision processes (Cohen, March and Olsen, 1972) in my model of Learned Ignorance. Garbage can processes indicate that decision-making is fundamentally ambiguous. For example, problems are not always clear, participation is fluid rather than stable, ideas are contradictory and most solutions are irrelevant rather than relevant. The mix of garbage in a garbage can depends on 1) the labels attached to the alternative cans, 2) the garbage produced at the moment, 3) the mix of available cans, and 4) the speed with witch garbage is being produced and removed. Managing knowledge gaps in such a context involves transforming weak and indirect links between people, choices, problems and solutions into direct and strong ones. It requires coordination and trial-and-error as well as flexibility and a high tolerance for ambiguity. A contribution of my study is that it highlights the coordinating role brokers or Facilitators may play in such situations as a result of their network position. A starting point on this matter would be to investigate how the broker sorts the garbage, establishes connections and thus bride specific knowledge gaps. Future work in this direction would also benefit by focusing on the processes of variation, selection and retention that help the brokers not only to sort the garbage and identify knowledge gaps, but also to manage and bride these gaps.

Behavioral element of Learned Ignorance: Organizational learning

Several scholars have discussed the idea that reflective practices are important in high-reliability organizations as they may prevent such firms from self-destruction, i.e. deadly accidents (Weick,

Suttcliffe and Obstfeld, 1999; Bigley and Roberts, 2001). But these scholars also underline that we have limited knowledge about how and why more mainstream organizations choose to develop such practices. My study of the Novo Group develops such insights by mapping the practices that potentially prevent successful mainstream firms from causing their own destruction, i.e. the Novo Way of Management. Historically, behavioral learning theory has shown how successful firms self-destruct (Cyert and March, 1963; Miller, 1994) as a result of searching for new routines only after experience indicate that existing successful routines can no longer be maintained. On many occasions this re-active behavior is intelligent and explains why March and his colleagues (Cyert and March, 1963; Levinthal and March, 1993) have failed to explain how such firms actually prevent their own destruction. My theory of Learned Ignorance and the story of the FDA-crisis take steps to fill this gap by suggesting that sometimes it may pay-off to change routines more proactively. The estimated costs of solving the FDA-crisis run in the millions. As a result of paying this prize, Novo has adopted a more proactive approach. According to Henrik Gürtler, CEO Novo A/S, it makes sense from a financial perspective to invest in facilitation. "We know that we make very good money on doing these things. The total cost of 14 full-time Facilitators is $4.2 millions and the entire cost for running the Novo Way of Management is around $10 millions. When you compare these numbers with our entire cost base of $2,120 millions you understand why facilitation is a very good investment."

Limitation

A limitation of my study is that it did not focus on the benefits of ignorance and knowledge gaps, but only on its costs. Future research could fruitfully investigate how ignorance has both costs and benefits. My proposition is that there is value in both knowing and not knowing. Here I

explored the value of knowing what you don't know. Future research needs to investigate the entire spectrum of costs and benefits of knowing and not knowing. Future work could also fruitfully take time and analytical levels into consideration (March, 1994). My proposition is that the benefits and costs of ignorance and knowledge are distributed across time and space. What is beneficial to know at one point in time and in one part of a system is not necessarily beneficial at another point in time and in another part of the system. A theory of knowledge that balances these trade-offs would make a welcome contribution.

Figure 1. A process model showing how Learned Ignorance consists of social-cognitive, structural and behavioral elements
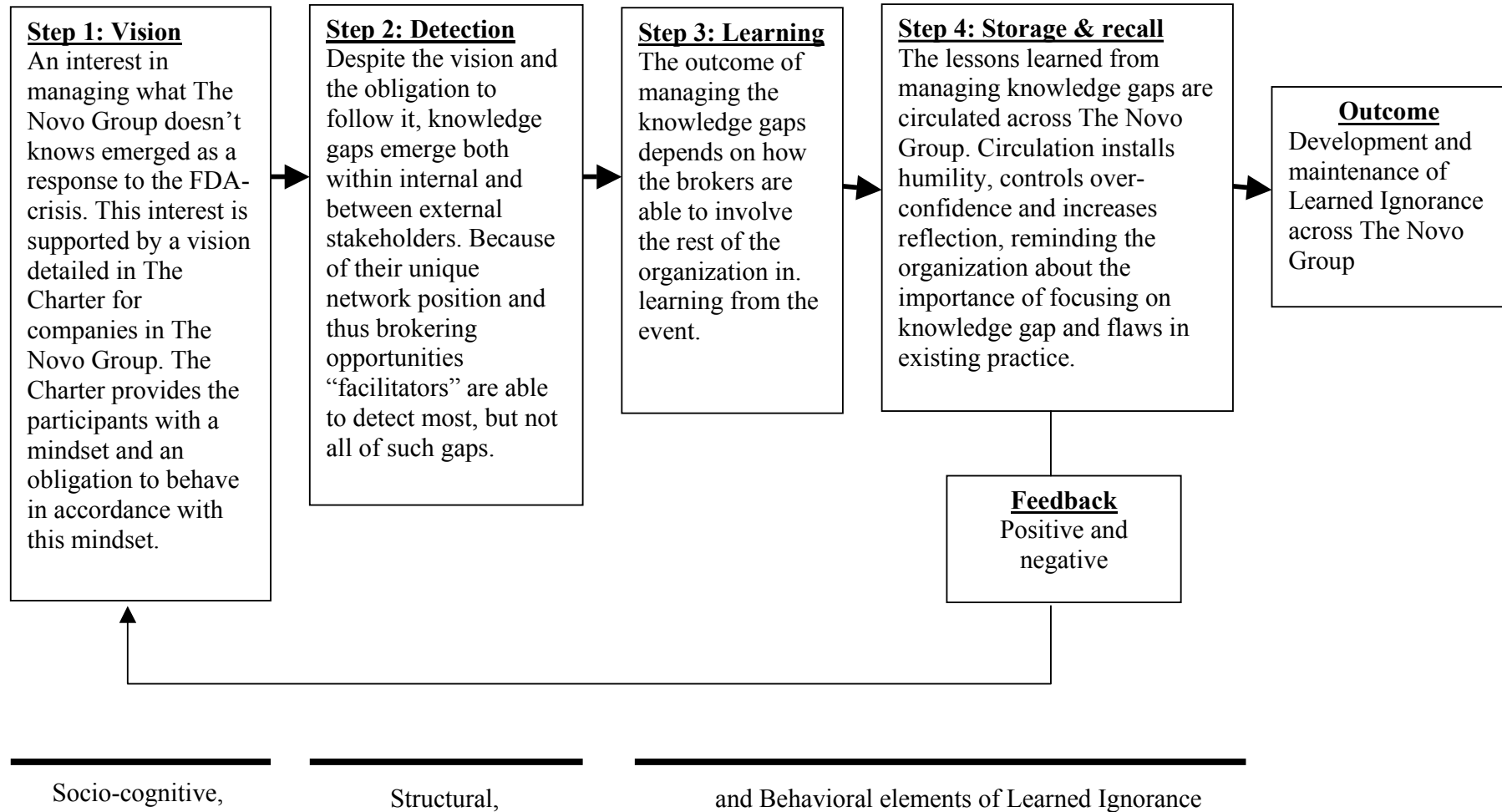
Step 1: Vision
An interest in managing what The Novo Group doesn't knows emerged as a response to the FDA-crisis. This interest is supported by a vision detailed in The Charter for companies in The Novo Group. The Charter provides the participants with a mindset and an obligation to behave in accordance with this mindset.

Step 2: Detection
Despite the vision and the obligation to follow it, knowledge gaps emerge both within internal and between external stakeholders. Because of their unique network position and thus brokering opportunities "facilitators" are able to detect most, but not all of such gaps.

Step 3: Learning
The outcome of managing the knowledge gaps depends on how the brokers are able to involve the rest of the organization in. learning from the event.

Step 4: Storage & recall
The lessons learned from managing knowledge gaps are circulated across The Novo Group. Circulation installs humility, controls over-confidence and increases reflection, reminding the organization about the importance of focusing on knowledge gap and flaws in existing practice.

Outcome
Development and maintenance of Learned Ignorance across The Novo Group

Feedback
Positive and negative

Socio-cognitive,   Structural,   and Behavioral elements of Learned Ignorance

Figure 2. Knowledge gaps and information flows in The Novo Group before and after the FDA-crisis

External environment   Organizational structure   Internal environment

Empowerment

Gap 1

Facilitators

Stakeholder Relations

Organizational Audit

Issues and events that are actively ignored or accidentially overlooked

Gap 3

Information flow

Gap 2

Issues and events that are actively ignored or accidentially overlooked

Information flow **before** FDA-crisis

Information flow **after** FDA-crisis
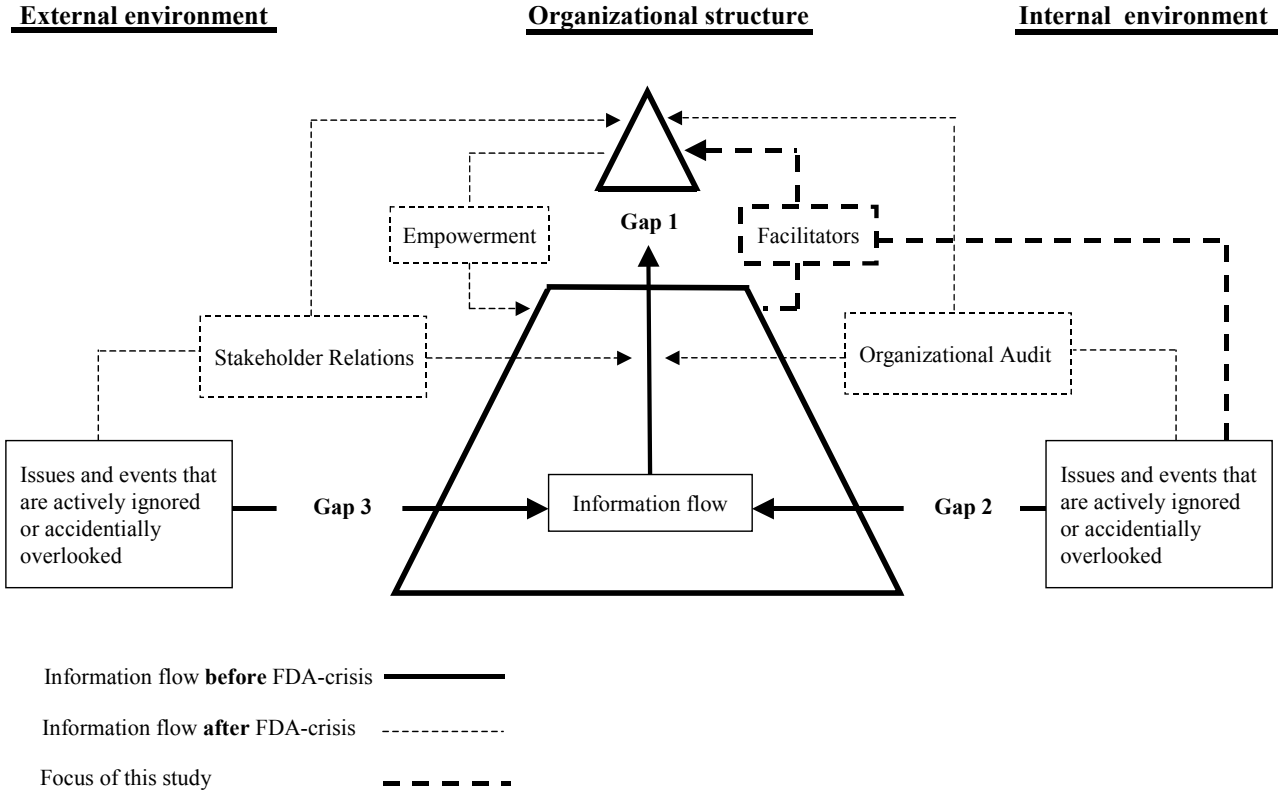
Focus of this study

Table 1. Evidence supporting development of Learned Ignorance across The Novo Group*

Process	Interviews	Seminar participation	Informal conversations	Documents
Step 1: Vision	**Strong evidence** "We experienced a crisis for some years ago. The crisis emerged because (1) the regulatory requirements significantly had gone up, and (2) because there was a sense of self-sufficiency internally in the firm." "We told ourselves, 'What kind of systems can we implement to minimize the risk that this happens again." "The idea was that we should develop a new follow-up system. If this system had been in place in 1993 it would have guaranteed managements full attention to the things that caused the FDA-crisis. Trust is good but it was also necessary to implement some kind of control to prevent that this could happen again."	**Strong evidence** "The FDA-crisis emerged because our management systems had become too confident, heavy and hierarchical." "The FDA-crisis occurred because we were not allowed to criticize and express our opinion." "Organizational Audit and Facilitations are important elements that help the individual manager to spot things that do not run as they are supposed to."	**Strong evidence** "People have told me that after the merger our CEO and our investors were unable to imagine that the company would find itself in a crisis 4-5 years later. It was almost impossible to imagine this scenario because when we looked back all that we could see was success." "The Novo Way of Management is a system that combines modern value-based management with traditional control." "The Novo Way of Management is clearly a system that requires that people are able to think on their own."	**Strong evidence** "I believed that we had everything under control … because we were World Champions. … The problem with World Champions is that they easily become impressed with themselves" (Mads Øvlisen, Chariman of the Board, Novo Nordisk, in Kacobsen, 2000: 136-137). "Building on the successful track record of of Novo Nordisk A/S and supporting the progress of all businesses, Novo A/S has developed a 'Charter' describing the basic values, commitments and managmeent principles that companies in the Novo Group should maintain. ... An importnewt part of the Charter is 'the Novo Way of Managmeent.'

Step 2: Detection	Strong evidence	Moderate evidence	Strong evidence	Strong evidence
	"A basic component of Facilitation is to talk with a lot of people." "As a Facilitator your core competence is to by-pass organizational filters to get the 'real' issues on the table." "The Facilitator's contribution is to say the things that nobody else dare to say."	"The Facilitator helps myopic and over-confident people become more open-minded by showing how things are done differently across the Novo Group."	"The Facilitators connect people, problems and solutions." "The Facilitators helps us to clean the dirty laundry." "Facilitators are sometime a kind of detectives."	"A facilitation of an organizational unit is a form of auditing that uses the demands formulated in the Novo Way of Management as its benchmark."
Step 3: Learning	Strong evidence "We try to create a learning environment by making it legitimate to fail, by focusing on empowerment, and by having a shot line of command." "The FDA-crisis has significantly influenced the way in which we are organized: our culture, management style, everything."	Sporadic evidence "Across Novo Nordisk we are working hard to implement a learning culture to help people build new competencies in fast ways."	Strong evidence "The Charter for companies in The Novo Group and the Novo Way of Management established a new way of thinking and working across the company. The FDA-crisis indicated that we needed this change." "Novo is a very open organization. This openness helps us to learn form each other and the environment."	Moderate evidence "The Novo Way of Management was launched as one of the ways in which The Novo Group would be able to prevent crises in the future."
Step 4: Storage & recall	Strong evidence	Moderate evidence "The FDA-crisis is clearly an important moment in our history." "Many stories are still being told about the FDA-crisis."	Sporadic evidence "In totality the Facilitation reports are a database." "When someone mentions FDA the organization is still reacting in a strange way. It is almost as if we can not forget what happened in 1994. It keeps us awake"	Moderate evidence "The FACIT Better Practice database has been closed because it hasn't been sufficiently successful. Too few better practices have been put in and people have found it difficult to adopt the better practices they found in there."

Strong evidence = a dominant theme in this data source that is consistently supported; moderate evidence = a frequent, but not constant theme in this data source that is consistently supported; sporadic evidence = a theme that appears occasionally in this data source and is consistently supported.

Table 2. The Novo Way of Management

Values	Commitments	Fundamentals
Accountable Each of us shall be accountable - to the company, ourselves and society - for the quality of our efforts, for contributing to our goals and for developing our culture and shared values. **Ambitious** We shall set the highest standard in everything we do and reach challenging goals. **Responsible** We shall conduct our business in a socially and environ-mentally responsible way and contribute to the enrich-ment of the communities in which we operate. **Engaged with stakeholders** We shall seek an active dialogue with our stakeholders to help us develop and strengthen our business. **Open and honest** Our business practices shall be open and honest to protect the integrity of the Novo Group companies and each employee. **Ready for change** We must foresee change and use it to our advantage. Innovation is key to our business and therefore we will encourage a learning culture for the continuous devel-opment and improved employability of our people.	**Financial responsibility** We will work to continuously improve our financial performance by setting high objectives for growth and value creation and deliver competitive performance in these areas. We will maintain an open dialogue with our stakeholders and comply with international reporting standards. **Environmental responsibility** We will work to continuously improve our environmental performance by setting high objectives and integrating environmental and bioethical considerations into our daily business. We will maintain an open dialogue with our stakeholders and report annually on our environmental performance. We subscribe to the International Chamber of Commerce's Charter for Sustainable Development. We support the United Nations Convention on Biological Diversity. **Social responsibility** We will work to continuously improve our social performance by setting high objectives and integrating social, human rights and health & safety considerations into our daily business. We will maintain an open dialogue with our stakeholders and report annually on our social performance. We support the United Nations Universal Declaration of Human Rights.	1 Each unit must share and use better practices 2 Each unit must have a clear definition of where accountabilities and decision power reside 3 Each unit must have an action plan to ensure improve-ment of its business performance and working climate 4 Every team and employee must have updated business and competency targets and receive timely feedback on performance against these targets 5 Each unit must have an action plan to ensure development of teams and individuals based on business requirements and employee input 6 Every manager must establish and maintain procedures in the unit for living up to the relevant laws, regulations and group commitments 7 Each unit and every employee must know how they create value for their customers 8 Every manager requiring reporting from others must explain the actual use of the reports and the added value 9 Every manager must continuously make it easier for the employees to liberate energy for customer related issues 10 Every manager and unit must actively support cross-unit projects and working relationships of relevance to the business

Source: Demerger Document, Novo Nordisk A/S, October 16, 2000, page 10.

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