DEVELOPMENT OF KNOWLEDGE MANAGEMENT STRATEGY IN PRACTICE: A CASE STUDY

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1. Introduction

Knowledge management aims to utilise organisational intellectual assets to increase productivity, value and competitiveness. Current research recognizes that one of the major predictors of knowledge management success is the alignment between business strategy and knowledge management strategy and subsequently the choice of information technology supporting these two strategies (Earl 2001, Binney 2001). One approach to aligning knowledge management and business strategies is to add a knowledge dimension to common strategy tools. There are many frameworks that have been developed by researchers but managers in organizations find it difficult to apply them in practice (Earl 2001).

This case study focuses on the relationship between business strategy and knowledge management strategy. The Knowledge Portfolio (Drew, 1999) is applied to a real case with the objective to examine the practicability of the framework. The Knowledge Portfolio is a SWOT analysis tool which is enriched by a knowledge level. The relevant business knowledge of an organisation is analysed from a strategic point of view. Subsequently, the results can be utilised to formulate a knowledge management strategy.

The focus of this study is the Canterbury Health Laboratories (CHL), a public organization operating in the knowledge-intensive medical and health sector. The information for the analysis was collected from websites as well as from internal documents and repositories. Additionally, seven interviews were conducted with respondents from various levels of the organisation. The objective of this case study is to apply Drew’s Knowledge Portfolio in practice. The business knowledge of the CHL is analysed and categorised with the aim to formulate a knowledge management strategy. Furthermore, this approach enables to draw conclusions on the applicability of the framework.

2. The link between business strategy and knowledge management

Strategy can be defined as “the match an organisation makes between its internal resources and skills, and the opportunities and risks created by
its external environment” (Halawi et al. 2006). Strategies emerge from the interaction between the firm and its environment as well as between knowledge workers and management (Nurmi, 1998). According to Porter (1996), the essence of strategy is in its activities, i.e. choosing to perform activities differently or to perform different activities than competitors. Halawi et al. (2006) point out in their overview of Porter’s five forces model and the resource-based view of the firm that sustained competitive advantage is built out of intangible, firm-specific resources such as knowledge which are “valuable, non-substitutable and inimitable”.

Tiwana (2002) states that a “clearly articulated link between knowledge management and business strategy is the key predictor” of knowledge management’s success. But how can knowledge be linked to strategy formulation? The following section focuses on the approaches of Zack (1999) and Drew (1999), which provides a rich set of methods to link knowledge with strategy formulation.

2.1 Strategy formulation

Drew suggests the enrichment of the tools (mission statements, competitive intelligence, portfolio matrices, SWOT, core competencies, the value chain and others) and schools (competence-based competition, emergent strategy, evolutionary approaches and others) of strategy through a knowledge dimension. He regards the integration of a knowledge management dimension as “a first step towards developing and implementing a knowledge-based strategy”. The study emphasizes the need for managers to use creativity when adapting these tools and schools. Drew describes several stages for building knowledge management into the process of strategy formulation, starting with mission statements. They lead to environmental scanning, where the use of knowledge maps as a component of a SWOT analysis is pointed out as invaluable for uncovering the strengths and weaknesses of corporate knowledge and as an essential first step. The concept of a knowledge-based SWOT analysis that provides a basis for describing a knowledge strategy is also stressed by Zack. A company should use the emerging knowledge map to “strategically guide their knowledge management efforts” and to identify “which knowledge-based resources and capabilities are valuable, unique and inimitable and how those resources and capabilities support the firm’s product and market positions”. These are essential elements of a knowledge strategy. Furthermore, he states that each organisation will find its own unique link between knowledge and strategy.

Halawi et al.(2006) point out that the alignment of strategy and knowledge management can occur in two directions. On the one hand, “a company can look at an existing strategy to reveal what knowledge will make it thrive”. This position is supported by Zack(1999), as he states that an organisation must articulate its strategic plan and then identify the knowledge needed to fulfil the proposed strategy. Drew’s approach refers to the intention to perceive “the
strategy knowledge relationship in terms of how knowledge and its effective management can create strategic or competitive advantage for a firm” (Halawi et al., 2006), which can be regarded as a mutual approach to link knowledge and strategy.

2.2 The Knowledge Portfolio

The SWOT analysis, as proposed by Drew and Zack, can be used to uncover the strengths and weaknesses of a company considering its intangible assets such as knowledge. In combination with knowledge mapping both authors develop a framework to deduce a knowledge management strategy from strategy formulation. Drew presents a portfolio model constructed around the dimensions of knowledge content and awareness, which is considered to be “helpful for strategic thinking”. Figure 1 illustrates his concept containing four types of business knowledge. From a strategy perspective, knowledge type four is considered to pose the greatest threats and opportunities for an organisation. Overall, firms should manage and exploit each form of knowledge in different ways, particularly because they all contribute to the overall strategy, in order to “create unique knowledge-driven sources of competitive advantage that provide superior value to customers and which are hard for competitors to copy and duplicate”.

<table>
<thead>
<tr>
<th>Knowledge Awareness</th>
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| 1. What we know we know | Emphasis: knowledge sharing, access and inventory  
Tools: e.g. benchmarking, communities of practice |
| 2. What we know we don’t know | Emphasis: knowledge seeking and creation  
Tools: e.g. R&D, market research, competitive intelligence |
| 3. What we don’t know we know | Emphasis: uncovering hidden or tacit knowledge  
Tools: e.g. knowledge maps, audits, training, networks |
| 4. What we don’t know we don’t know | Emphasis: discovering key risks, exposures and opportunities  
Tools: e.g. creative tension, audits, dilemmas, complexity science |

*Figure 1: Drew’s knowledge portfolio*

3. Organisational background

This section provides an overview of the organisation of the CHL (Canterbury Health Labs). A description of the core processes is provided with a focus on existing practices related to knowledge management. All presented information was collected from corporate websites, internal documents and personal interviews.
3.1 Organisational structure and environment

The CHL is the largest medical laboratory in the South Island of New Zealand. It is part of the “Hospital & Specialist Service” division of the Canterbury District Health Board (CDHB). The CDHB is responsible for providing or purchasing government funded health care services for the population of the district of Canterbury. As an organisation of the public sector its objectives are to improve, promote and protect the health of communities; and to promote the integration of health services, especially primary and secondary care services. Therefore, the CHL is located next to Christchurch Hospital as their main business is to perform all testing on patients. Additionally, it operates smaller laboratories where routine tests for local purposes are executed. Moreover, the CHL receives daily requests to perform specialist tests from hospital and private laboratories from all over New Zealand. This as well as the national and international experts forming its staff gives it the status of a reference laboratory with a nationwide catchment area.

Formally, the CHL is liable to the policies introduced by the CDHB. Thus, the strategic plan created in 2007 is binding for the CHL. It contains five goals which encompass the improvement of its systems and processes as well as its practices. In addition, the CHL formulated their own mission statement which is “quality pathology services delivered by quality people within a sustainable organisation”.

Originally located within the hospital, the main service of the CHL is to perform tests on samples for patients of the hospital. Besides the Christchurch Hospital as its main customer, external laboratories refer to the CHL’s expertise with requests for special tests. Secondary, external patients address the CHL directly. In view of the competitive environment, two privately owned laboratories appear to be serious competitors. The first, MedLab South, is part of the Sonic Healthcare global corporation and the second, Hill Laboratories, operate services for all of Australasia.

3.2 Processes and knowledge

CHL provides 950 different tests with an annual testing of over 2.5 million analyses. The organisation is divided into different sections which include the two main areas of Core Biochemistry and Haematology. These sections are able to perform automated high volume tests. The main customer is Christchurch hospital. A typical testing process on an automated line starts with the receiving of a sample at the registration. It is furnished with a barcode and the associated data sheet is scanned and transferred to the laboratory information system (LIS) Delphic. The sample then proceeds to the appropriate line of automated analysers, and then the documented results are interpreted by the staff and/or sent back to the hospital. Furthermore, every section provides manually executed specialist
tests running on low volumes which are requested by the hospital as well as by external patients, and clients respectively. The steps for these tests are similar to those of the high volume tests but without the extensive use of automation. Additionally, research and development (R&D) is part of every section, but its magnitude differs from area to area. Typical processes here are the development or modification of test procedures.

A knowledge management strategy is not in place, both on the level of the Christchurch District Health Board (CDHB) and the CHL, although the medical and health sector is a knowledge-intensive area. Most of the over 300 staff employed have an academic degree. Additionally, it is mandatory for recruits to accomplish a twelve weeks training and education program before they get fully integrated into daily business. This program includes mentoring and continuous supervision by experienced employees. In terms of knowledge, the automated lines are based on formalised knowledge. However, every single test still passes the assessment of a worker, as the analysers only provide data that needs to be interpreted. The specialist tests contain more manual work and refer to a higher degree of individual and tacit knowledge. Research and Development is the most knowledge intense process within the CHL.

Existing practices related to knowledge management appear for the most part on a technology level. The LIS Delphic provides a full and complete service for CHL’s processing needs in terms of data handling and storing. Especially, it is crucial for the automated lines as it manages data from the scanned registration form to the report of the results. Furthermore, Delphic is also utilised by five other laboratories via a Multilab arrangement where the information systems (IS) department of the CHL supplies the LIS and maintains the associated database. Another application in place is a static Intranet which gives access to various documents like the location manuals of the CDHB. A very new application is the web-based Testmanager which was introduced in April 2009. This database contains all information regarding tests performed by the CHL, including specifications, process information, contact details of particular experts and the prices.

Within the different sections, several concepts for staff meetings are established. One particular pattern is a weekly meeting of a section’s staff members with the associated pathologist in order to examine recent cases and discuss the test performances. Moreover, scientists have the possibility to attend international conferences within their field of expertise.

4. Analysis

The Knowledge Portfolio is constructed around the dimensions of knowledge content and knowledge awareness. As pointed out in the description of the organisational background, knowledge is a major contribution to the business
processes of the CHL. Thus, the entire organisation is affected by the effective and efficient management of business knowledge. It is identified and analysed in four categories which are displayed in Figure 1. The following sections provide a detailed description for every type of business knowledge.

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<tr>
<td>3. What we don’t know we know</td>
<td>4. What we don’t know we don’t know</td>
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**Figure 1: Drew’s Knowledge Portfolio**

4.1 What we know we know

This quadrant describes the business knowledge that is available and which the organisation is aware of. It focuses on knowledge sharing, access and inventory. Basically, most of the practices related to knowledge management which are mentioned in section 2 apply to this category.

4.1.1 Technology and information management

The Delphic LIS is crucial to the performance of laboratory tests. It supports the flow of information when a sample gets processed, either along the automated lines or within manual testing. In the context of knowledge management, the CHL uses an extension program for Delphic, Eclair, as a data repository. Its advantage is that dated test results and documents can be tracked back for possible reviews in the future. Additionally, the clinical documentation portal Concerto is used to manage and organise patient data, but only internally. Another technology in place is an organisation wide Intranet. The applications for this tool are fairly limited. Several location manuals introduced by the CDHB can be accessed as well as other documents related to the administration of the organisation. The Intranet is hardly used by the staff because of its limited range of applications and its low relevance to the core business. Thus, the utility to support knowledge management is low.

A recently implemented database is the web-based Testmanager. Every test performed by the CHL is listed and can be accessed over a web portal. This enables external patients and customers as well as internal customers to gather information about pricing, specimen collection, instructions for referral and contact details of the associated scientist of a specific test. Moreover, the knowledge exchange within the CHL is facilitated. This application could also serve as a “yellow pages” as it identifies the responsible scientist for every test,
in addition to the task based competency records. The latter contain information about “who is in charge for what with which qualification” and are hierarchically organised. They are utilised to support staff members who need a second meaning or consultation for analysing and interpreting tests.

As a part of R&D, the process of developing or modifying test procedures is bound to strict regulations. Every step from evaluation to revision is defined and documented for the purpose of traceability and in the case of a possible implementation. The accruing amounts of documents are stored in an archive in the basement where additional documentation regarding the technical laboratory equipment, for instance, are deposited and kept for years. These circumstances tend to impede the sharing and accessing of knowledge contained in the documentation.

4.1.2 Knowledge sharing

Apart from the technologies in place, interpersonal knowledge transfer is a crucial element of CHL’s business. Staff members need to have academic education to work in this knowledge intense environment. Additionally, new employees go through twelve weeks of training and mentoring at the very beginning of their employment. It is essential that every staff member involved in the daily business is able to execute every high volume or common low volume test in their section. Therefore, people are regularly swapped between workplaces within their area, whereas experienced staff members maintain a fixed sector for supervisory reasons. In contrast, the ability to perform more uncommon specialist tests is limited to a small circle of experts.

The CHL established regular meetings where recent cases and issues are studied together with a pathologist in order to facilitate an ongoing and continuous education of staff. An identical goal is pursued through monthly educational lunches. Cross-sectional meetings, on the other hand, only occur on a management level. The sharing of knowledge across sections is not facilitated. On the level of R&D the CHL offers in house seminars. But in terms of knowledge sharing, it is more likely here to catch up on topics during “coffee break” or at coincidental meetings in passing.

On an external level, the CHL operates in the Labnet network. This is an alliance of public sector pathology laboratories (of the district health boards from Hawke’s Bay, Marlborough Nelson, Taranaki and Canterbury) who have agreed to work together in order to benefit from a strong brand, common systems and economies of scale. Therefore, all members operate their processes with the same LIS (Delphic & Eclair) which is hosted and maintained by the IS department of the CHL. Since the other laboratories in the network benefit from the status of the CHL and call on their services, knowledge sharing is rather unidirectional. Some meetings are also broadcasted as video conferences between different laboratories.
In terms of interpersonal knowledge sharing with external clients, the CHL runs a budget to send scientists to international conferences. Since the status as a reference laboratory is of great importance to the CHL, sending people overseas is necessary to retain and develop its outstanding reputation. The budget is requested from and confirmed by the CDHB. The process of knowledge exchange with the hospital only occurs on the level of contact between clinicians and medical directors, as well as pathologists respectively. Thus, a certain range of knowledge remains in a small circle of people.

4.2 What we know we don’t know

This quadrant refers to knowledge which is lacking in the organization but there is awareness of it. The focus here is on knowledge seeking and creation.

The R&D activity is an obvious and crucial element for the CHL. The organisation knows that they constantly have to seek for new testing methods and procedures that add value to the business and to nourish their reputation as a reference laboratory. The CHL needs to stay competitive in the face of incorporated competitors who have resort to higher funding. Although the research part turns out to be very individually embossed in its execution and performance, the actual process of the development or modification of a test is strictly prescribed. The documentation of this process is carried out on hard copies.

One major issue addressed by the interviewees is the partial insufficient usage of existing and potential data, as well as information, within the CHL. For instance, there is suitable data stored in the LIS repository that could be used to prepare daily figures and reports of output, flow-rates or overall performance. These measures would add value to the existing information. Another issue related to this topic is the Intranet. It is hardly used by the staff and too static for the utilisation of knowledge sharing. For this reason, the IS department of the CHL made an attempt to implement a SharePoint solution in order to facilitate the use of forums, blogs and to enhance organisation wide document sharing. This initiative to support knowledge sharing throughout the laboratory was abandoned as several problems with the configuration and implementation occurred.

Christchurch Hospital is declared to be the main customer of the CHL. The chain of information starts with the patient and continues with the clinician to the laboratory, and looped back respectively. As described in section 2.2, the test process within the CHL begins with receiving the test request form. Any information not contained on this form is unknown to the laboratory. It was addressed that a decision support system covering the whole chain would improve the overall service by transferring information all the way from the patient to the CHL. Consequently, the laboratory staff would have more knowledge about the “real” main customer: the patient. The actual decision support system could
link every performed test to a patient. Thus, the laboratory staff would have the option to review a patient’s former test results or cross-reference it with similar tests performed on other patients. Furthermore, the system could cross-reference a test with different, but associated tests which would instantly help a staff member to make a decision on further actions. However, such a decision support system requires having an electronic requesting system in place. The feasibility of electronic requesting is currently surveyed by the IS department.

4.3 What we don’t know we know

The uncovering of hidden and tacit knowledge is the main focus of this business knowledge type. More precisely, it deals with knowledge the organisation already has, but is not aware of. The extraction of this knowledge is beneficial for the CHL, since it was stated that the major type of knowledge within the laboratory is tacit, although daily business relies heavily on explicit knowledge.

The practices of knowledge sharing in place (see section 3.1.2) also allow the extraction of hidden knowledge. Basically, it can be uncovered in meetings or especially during the training and education program, but there is no explicit initiative in place to foster the extraction of tacit knowledge. Furthermore, the transfer of possibly uncovered knowledge is only done from person to person; there is no attempt to record it on documents to make it available throughout the laboratory. This issue will be increasingly important in the future (10-15 years) as the CHL faces a massive loss in workforce due to the retirement of the “baby boom” generation. Hence, the loss in hidden knowledge would be substantial since the training and education program for recruits is not able to support the transfer over every facet of knowledge that resides in the heads of experienced staff members. However, the CHL is aware that they have to mobilise higher numbers of recruits, but they are not aware that the loss of individual knowledge would still be threatening to their internal processes. Therefore, it is beneficial for the laboratory to implement initiatives and incentives for staff members to uncover their hidden knowledge.

4.4 What we don’t know we don’t know

From a strategy perspective, this type of business knowledge perhaps poses the greatest threats and opportunities to an organisation. In this case the organisation is not aware that it lacks specific knowledge.

If we go back to the crucial process of R&D, we analysed that the CHL needs to be innovative in order to stay competitive and to strengthen their reputation as a reference laboratory. But in terms of knowledge management, there are only few initiatives in place to support the scientists. Moreover, initiatives that foster knowledge sharing and therefore support the process of knowledge
creation are not existent on the R&D level. For instance, motivating scientists to join or establish communities of practice would expand their networks of expertise where they could seek for knowledge beneficial to the CHL. Another issue is the documentation of research processes on hard copies and their storage in a basement archive. As mentioned before, this hinders the access of knowledge. Information technology in combination with the digitalisation of the documentation process is able to support R&D activities and simplifies the access and the sharing of knowledge. Possible advancements in the field of research obviously have a direct impact on the overall business as they lead to a higher rate of process improvements, for instance.

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<thead>
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<th>1. What we know we know</th>
<th>2. What we know we don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Technology as a support for knowledge management (LIS, Testmanager)</td>
<td>R&amp;D important for knowledge seeking and creation</td>
</tr>
<tr>
<td></td>
<td>Staff education and training</td>
<td>Add value to data and gain knowledge from it</td>
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<tr>
<td></td>
<td>Networks and international conferences</td>
<td>Decision support system to improve the overall service</td>
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<tr>
<th>Knowledge Content</th>
<th>3. What we don’t know we know</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uncovering hidden and tacit knowledge</td>
<td>Need for knowledge management support on the R&amp;D level</td>
</tr>
<tr>
<td></td>
<td>Indirectly achieved through meetings and training</td>
<td>Culture and initiatives for knowledge sharing beneficial for the overall business</td>
</tr>
<tr>
<td></td>
<td>Explicit initiatives would be very beneficial</td>
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Figure 2: Main findings of the analysis

Overall, the CHL has no formulated culture of knowledge sharing in place. There are different practices facilitated within the organisation, but the existence of incentives and initiatives to share knowledge can create a higher value to the business. However, a certain degree of “professional jealousy” was reported which poses a barrier to possible initiatives. But the CHL needs to bridge the gap over exactly these constraints. Figure 2 displays the main findings of the case analysis.

5. Conclusion

Knowledge is a crucial element for the business of the CHL. They have a strong need to further utilise the potential knowledge within the organisation. There is some support of the daily business through knowledge management practices but there is still room for further improvement. The R&D process lacks initiatives related to knowledge management even though it is a crucial section of the CHL. The overall organisation would benefit from a culture of and incentives
for knowledge sharing. In terms of strategy, the analysis points to the direction of elaborating a personalisation strategy throughout the laboratory in addition with a selective codification strategy for assorted sections. However, this statement is vague and allows further interpretation in different directions.

Therefore, the ability to formulate a knowledge management strategy by solely using Drew’s Knowledge Portfolio is limited. The analysis is just a first step towards the formulation of a knowledge management strategy within a complex organisation and environment. The main findings and the accompanying issues need to be examined and evaluated in greater detail in order to be more precise with the conclusion on the crucial knowledge intense processes. For instance, the Business Process Analysis on a knowledge level would be a very useful extension. However, applying the framework of this paper allows a very broad view on an organisation’s strategic knowledge and it is a good starting point to align a knowledge management strategy to the business strategy.

During the analysis, Drew’s Knowledge Portfolio revealed a few shortcomings. First, the classification of findings to the four categories is sometimes ambiguous. Some aspects might overlap different types of business knowledge and need a closer revision of their fit. This is also a matter of interpretation; hence the outcome of this framework might differ from user to user. Secondly, this leads to a separation of aspects between different types of knowledge. It is important to maintain an overview while dealing with the allocation of findings in order to set the right connections between the separated aspects. Despite these issues, Drew’s Knowledge Portfolio has proven to be a functional and convenient tool to identify the strengths and weaknesses of an organisation’s business knowledge.

6. References


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