# Erasmus University Rotterdam

## Rotterdam School of Management (RSM) Erasmus University

## Department of Accounting and Control

# "The dynamic interplay between strategy and MACS"

## A case study at a Dutch Shipping company

**Coach:**       Dr. F.H.M. Verbeeten (Dep. of Accounting and Control)

**Co-reader:**       Dr. T. Mom (Dep. of Strategic Management and Entrepreneurship)

**Master Thesis of Pim Nelemans (337843)**

TABLE OF CONTENTS

## EXECUTIVE SUMMARY

During their existence companies often alter strategy. These changes in strategic objectives can be caused by external as well as internal factors that result of how companies have their way of doing business. These strategy changes can and will have impact on the organization, systems, procedures and competences that are present within companies. Once the new strategy is being implemented in an organization, the impact of this change onto the organization will cause dynamics in the alignment process of these topics. While research on strategy, organization and management accounting change has had a vast interest, little attention has been directed to the influence of these dynamics in the implementation processes of these various items. In this research project, I have investigated the dynamics that occur within an organization that faced significant strategic changes, as a result of a rapidly changing external environment. This research project has indicated that the dynamics that occur during several implementation processes need to be carefully managed. Attention of senior management; decision making and communication are key factors in order to align the several implementation processes in order to have a successful roll-out of the new defined strategy and the changes that come along with it. The insight that alignment of change of organizational architecture and management information systems as a result of strategy change is an ongoing dynamic process that needs strong guidance and a clear alignment strategy set by higher management is a contribution for theory as well as practice.

# 1 RESEARCH BACKGROUND

## 1.1 Introduction

Relationship between strategy, organizational architecture and Management Information Systems (MIS) are topics with a broad variety of research. However, research on the relationship between organization architecture and MIS, under influence of strategic change, has been scarce. In the call for research (Sutton, 2006), *reshaping accounting of an organization as a result of ERPS introduction*, it is emphasized that more research in this area is needed. Organizational architecture and MIS need to be reshaped as a result of strategic change, however the way organization architecture and MIS are influenced by each other is something that needs further research. Organization architecture and MIS within the context of Management Accounting and Control Systems (MACS) can influence each other driven by contextual and process factors.

It can be concluded that a lot of literature focuses on the fact that a certain strategy results in an organizational architecture and information system that have a good fit with the type of strategy. Companies following a certain strategy most likely will adopt an organization structure and use MIS that will result in the highest contribution in achieving their strategic goals. Next to this field of research, a lot of research has been performed that look at the change within all these systems and how this change in organization can be explained. Once an organization decides to change its strategy (at corporate or business unit level), change in organizational architecture and information systems are likely to occur as well. In the existing literature, less attention is given on how this change process can be managed. Within the change process several factors play an important role in order to facilitate this alignment in change of strategy and change in organizational architecture and information systems. This thesis will shed some light on how change in strategy will lead to change in organizational architecture and change in MIS. In particular the challenge a company is facing to get these factors aligned and how this alignment is facilitated by introducing a change management process will be the main topic in this thesis.

The outline of field of research within this thesis is given in Figure 1-1. It is noted that change of strategy is a given fact (strategy as an intention and position). During this thesis organizational architecture and MIS are always mentioned within the MACS context.
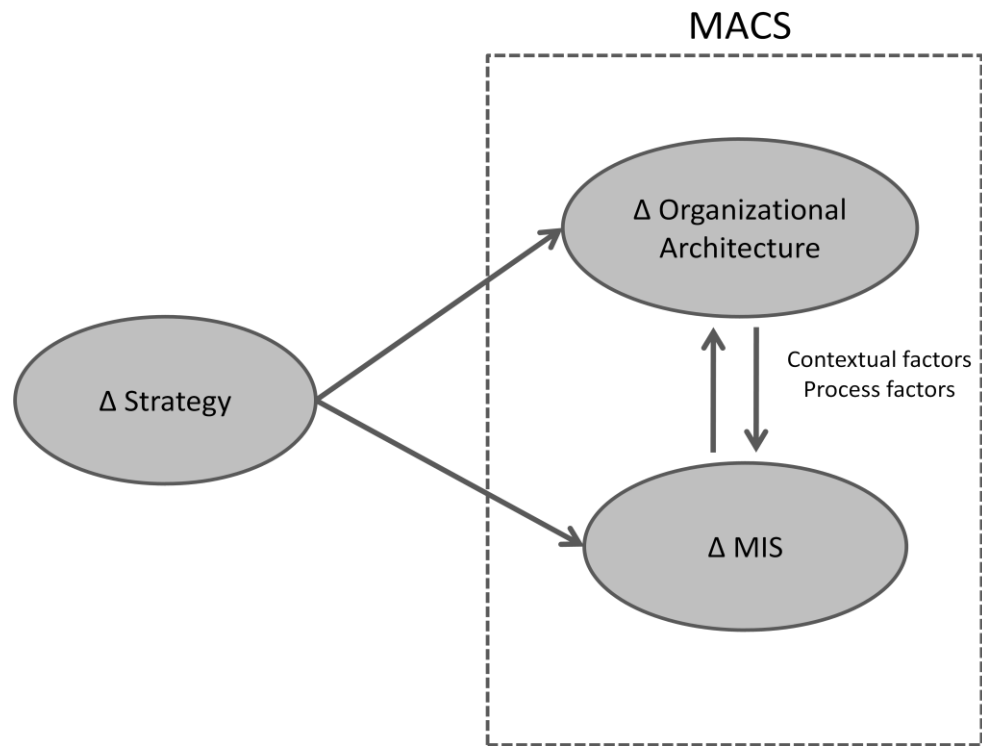


**Figure 1-1: Theoretical model.**

## 1.2  Definitions

Within this thesis terms as strategy change, organizational architecture, management information systems and management accounting and control systems will be used frequently. Definitions of these elements are given below in order to define how these elements are defined within this research.

Organizational architecture[1]:

Company's design of administrative devices to (1) measure performance, (2) evaluate performance, and (3) partition decision rights.

Management Information Systems (MIS)[2]:

The systems that have certain features that is common to all information systems within a business. These are:

- Identifying and capturing relevant information;
- Recording the information collected in a systematic manner;
- Analyzing and interpreting the information collected;
- Reporting the information in a manner that suits the needs of individual managers.

Management Accounting and Control System (MACS) [3]:

All the devices or systems managers use to ensure that the behaviors and decisions of their employees are consistent with the organization's objectives and strategies.

---

[1] Zimmerman (1995), p. 169
[2] Atrill and McLaney (1995), p. 21
[3] Merchant and Van der Stede (2003), p. 5

## 1.3 Problem Statement and Research questions

Main question that will be answered in the thesis:

---

*How is the alignment between change of organizational architecture and change in Management Information Systems as result of change in strategy achieved?*

---

- How does change of strategy influence change in organizational architecture?
- How does change of strategy influence the change of Management Information Systems?
- How can organizations align their change of organizational architecture and change of Management Information Systems as a result of change in strategy?
- What change management strategy can be used to facilitate such a change process?

## 1.4 Research objectives

### 1.4.1 *Academic*

Much is written about change in strategy, organizational architecture and management information systems and many studies focuses on these topics separately. However, little is known about the interplay between these topics and how the dynamics related to this interplay influences alignment within an organization. Therefore the objective of this thesis is to gain more insight on how this dynamic interplay can be controlled and how this interplay influences the successful alignment of change in organizational architecture and management information systems after the strategy has been altered.

### 1.4.2 *Managerial*

As companies alter their strategy as a result of changing internal and external environments, management of these companies needs to be aware of the consequences that are a result from strategic change. Often the focus of management stays at the strategic objectives that are formulated, therefore the management on alignment of the

processes within the company does not get attention is should get. This thesis will try to provide insights in the dynamics of the interplay between strategy, organizational architecture and management information systems. These insights could be a useful tool for managers that are facing strategic change and the dynamics within aligning the organizational processes that come along with it.

## 1.5    Thesis Structure

The first chapter introduces the study, identifying gaps in the literature and presenting the problem statement and research questions. Chapter two elaborates on what is written in the literature about the concepts strategy, organizational architecture and MIS and how change in strategy can lead to change in organizational architecture and MIS. Chapter three describes the method that is used to perform this study and the results and discussion can be found in chapter four. Finally, the fifth chapter will present the key findings, the recommendations and its limitations and implications for further research.

## 2  LITERATURE REVIEW

## 2.1  Strategy and Organizational Architecture

### 2.1.1  *Introduction*

Strategy and MACS seem to have a clear relation with each other; however how this relationship is conceptualized has been approached in many ways. In a particular area of research it is considered if MACS follows strategy or vice versa (Gordon and Miller, 1976; Bromwich, 1990; Dent, 1990; Ittner and Larcker, 1997; Slagmulder, 1997, Kald ea., 2000, Marginson, 2002, Naranjo-Gil and Hartmann, 2007). Naranjo-Gil and Hartmann (2007) suggest that the accounting literature, in contrast, emphasizes the role of the management accounting and control system (MACS) as an organizational mechanism that supports strategic change (Dent, 1990; Nilsson & Rapp, 1999). However, empirical studies have not addressed the way in which management uses the MACS to engage in strategic change directly, with a number of interpretative case studies as a notable exception. This section will discuss the existing literature regarding strategy and MACS (organizational architecture in particular) and define the area where this thesis will contribute to the existing literature.

### 2.1.2  *Definitions strategy and organizational architecture*

The definition of strategy has been addressed in much literature and therefore it is difficult to give one clear definition of strategy. A common definition can be given as follows: plans of top management that should lead to results that fit the mission and goals of the organization (Wright e.a., 1992:3). One of the major topics a company needs to consider when operating in competitive markets is which strategy a company needs to follow. In case companies alter their products or services and want to compete in new markets, change in strategy needs high attention from senior management. Many companies follow a cost leader or differentiation strategy (Porter, 1985) and by doing so, they will adopt certain organizational architecture in order to maximize their objectives.

Another approach is to follow a defender or prospector strategy. Simons (1987) claims that high performing prospector firms seem to attach a great deal of importance to forecast data in control systems, setting tight budget goals, and monitoring outputs carefully. For prospectors, cost control is reduced. In addition, large firms appear to emphasize frequent reporting and the use of uniform control systems which are modified when necessary. Defenders, particularly large firms, appear to use their control systems less intensively. Defenders emphasized bonus remuneration based on the achievement of budget targets and tended to have little change in their control systems.

How and what kind of alignment has to be chosen remains rather difficult to determine. In this respect research has shown that there are certain configurations of fit between strategy and organization. Miller (1986) believes that elements of structure cohere within common configurations, as do those of strategy. Furthermore, these configurations are themselves interlinked in that there are natural congruencies between particular strategic, structural, and environmental configurations. In his model an overview is given of successful configurations of strategy.

Later research has similar approaches to this model. Once companies decide to follow a strategy of cost leadership or diversification, models show that not only structure, but also MACS and eventually their performance are influenced. Jermias and Gani (2004) posit that there is a contingent relationship between competitive strategy, organizational design, and management accounting systems. Achieving a proper match between strategies, organizational design and management accounting systems is predicted to enhance organizational performance. In his research Chenhall (2003) claims that strategies characterized by conservatism, defender orientations and cost leadership are more associated with formal, traditional MACS focused on cost control, specific operating goals and budgets and rigid budget controls, than entrepreneurial, build and product differentiation strategies. Concerning product differentiation, competitor focused strategies are associated with broad scope MACS for planning purposes, and customization strategies are associated with aggregated, integrated and timely MACS for operational decisions.

### 2.1.3    Relationship strategy and MACS

It is claimed that an important reason for this lack of evidence is that studies on the MACS strategy relationship have typically modeled strategy as an (exogenous) determinant of MACS, rather than as an (endogenous) consequence of the MACS, as they typically conceive strategy as an intention and position, rather than in terms of emergence and change (Gerdin & Greve, 2004; Henri, 2006). In general it can be stated that companies need to design their organization structure and information systems in such way that it will have a good fit with their strategic intentions. Early research already showed that it seems possible for a custom designed MACS to improve poorly functioning organizations by providing information most relevant to the key organizational problems and opportunities (Gordon and Miller, 1976).

Dent (1990) describes in his paper the possibilities for accounting research in the field of strategy, organization and MACS. It is claimed that due to extensive use of short-run financial calculations to appraise managerial performance is deemed to have diverted managerial attention away from fundamental value-creating activities. This could validate that chance of strategy can be a result of using an appropriate MACS or vice versa. Using MACS based on business models preceding strategic change can lead to inappropriate accounting and thus decision making of higher management. In other words: adopting a particular strategy seems to imply that it is accounting that has to adapt (Skaerbaek and Tryggestad, 2010).

Taken these facts into account, companies should be aware of the fact that following a certain strategy could imply change in their MACS. This can be obtained by changing their accounting principles in case of an IPO, or using different cost management methodology. Skaerbaek and Tryggestad, (2010) use the example, by drawing a boundary between the 'inside' and 'outside' of a strategy, that is to say the conditions that are taken into account and acted upon (e.g. own cost structure), as opposed to the conditions that are considered to be outside and beyond strategic intervention (e.g. the competitor's cost structure). By changing company processes that are used for a longer period, organizations will have to adapt to these new principles. For example an organization will have to change their established hierarchy. Cost management could

alter as new insights are needed in order to compare performances with new competitors within a new area of business as a result of the strategic decisions.

### 2.1.4 *Change of strategy*

It can be concluded that company's decisions to change strategy result in change in their internal environment. Often strategic change is initiated by changes in the market which leads to strategic choices an organization has to take. Competitive strategy can lead to cost or differentiation advantage, either of these two choices will lead to a focus on improving the existing competences or starting up new ones (Porter, 1985). In case new business models or business units will be introduced it has to be considered to align its organizational architecture along with it. Organizations may change because competitive environments force them to do so (Barnett and Carroll, 1995). Langfield-Smith (1997) even claims that a MACS that is designed to support a certain intended strategy may not contribute to effectiveness if that strategy is never realized, and a different strategy could emerge.

Strategic decisions are often related to the market environment in which the company is operating. Strategic decisions within an organization can lead to minor changes in production methods or in the organizational architecture of a company. In case these changes are relative small the organization is capable to absorb these changes within a certain time window. In case the changes have a higher impact, companies need to restructure their organization. Earlier research (Hopwood, 1987; Gosselin, 1997; Verbeeten, 2010) suggests that market change can lead to change in production policies (strategic choices), which indirect will lead to organizational change and information system change. Ultimately these two factors will cause MACS change. Within the context of his research, Hopwood (1987) is questioning what the role of accounting within an organization is and how the system is evolving throughout time. It is suggested that MACS are not just plain techniques, but is related to other organizational factors as well. By assessing three cases it is showed how accounting within different organizations is affected by multiple factors. It is concluded that once the MACS is embedded in the organization, it will be influenced by several factors within the organizational context, such as strategy, structure and management

approach towards the system. In addition it is suggested that an accounting system could help shape the development of an organization through time. This implies that once a company decides to follow a particular strategy, the consequence will be that organizational architecture will have to be aligned with the strategy that is implemented. In addition different type of companies will need to look for alignment that fits the internal environment of the company. Not all companies can use the same approach in order to align their structure with their intended strategy. Existing literature acknowledges this and therefore already a substantial amount of research dealing with the relationships between strategy and structure exists.

| 2.1.5 | *Change in organizational architecture* |

Much research has been done looking at the influence of strategy on several business practices, including organizational architecture (Roberts and Scapens, 1985; Abernethy and Brownell, 1999; Gurd and Thorne, 2003). The growing level of global competition intensified the challenges for managers who need to consider more effective ways of achieving competitive advantage and improving organizational performance. One means of achieving this is through the adoption of clearly articulated strategies, flexible organizational structures and innovative accounting systems (Baines and Langfield-Smith, 2003). In their research the objective was to examine if an increasingly competitive environment and organizational variables will initiate MACS change. More specifically, this study investigates whether changes in the organizational environment have led to changes in the organizations' strategy, organizational design, advanced manufacturing technology and management accounting practices. Amongst their conclusions is found that it appears that strategy is driving changes in organization design, technology and MACS and it is these organizational changes that drive the changes in non-financial information.

Once the circumstances for organizational architecture change have been validated, the design will have to be implemented into an organization. The 'specific circumstances' influencing management accounting comprise a set of contingent variables including, for example, the firm's environment, its technology and its organizational architecture (Innes and Mitchell, 1990). As it is no single predefined system or competence that

can be introduced into a company, the implementation process needs attention. Factors that will influence this implementation are the context of the organization, willingness of the people within the organization and how well the process is structured before actual implementation. Multiple factors play a role within change of MACS. Innes and Mitchell (1990) categorized these factor as follows; Facilitators, set of factors that compromise conditions conductive to management accounting change which were necessary but not sufficient, in themselves, for the change to occur. Facilitators, set of factors that considered to be influencing the observed changes in a general manner. Motivators, set of factors that are directly associated with the change with their occurrence corresponding closely to new timing of change. In order to successfully change management accounting these categories can help to identify what the organization needs to think of before starting implementation of new MACS.

It is a given fact that a lot of the implementation of new MACS turn out to be a failure (Gosselin, 1997). There have been attempts to document the reasons for these failures, but much of this research focuses on the organizational level problems associated with the implementation of MACS innovations. However, little research directed towards understanding the attitudes of the users to MACS innovation and the factors influencing those attitudes (Abernethy and Bouwens, 2005). In their study this aspect of MACS implementation is further investigated, in particular the attitude of frontline managers. They expect in their paper that the delegation of decision rights to be the primary determinant of production managers' acceptance of these innovations. When lower level managers are delegated decision rights, MACS can be used to measure if managers are using decision rights optimally. These managers, therefore, will be concerned when new systems are implemented as there is potential for these systems to directly influence how their performance is evaluated and rewarded.

Organization change as a result of strategic decisions is often caused by multiple direct or indirect factors. Literature categorizes these factors as process and contextual factors (Armenakis and Bedian, 1999). Implementation of systems and/or programs takes a lot of effort and time before a company succeeds in a complete integration of the new systems with the existing ones. This process can be frustrated by all kind of

factors that influence this process. Anderson and Young (1999) found that although the process of implementation clearly influences the outcomes of an ABC implementation, both the process and the outcomes are directly influenced by the contextual setting. This indicates that other similar implementations of corporate wide supporting systems could face the same issue. Therefore it is useful to understand in which contextual setting an implementation process of a given system is carried out. Knowing which contextual and process factors actually influence the implementation, will benefit the implementation process.

2.1.6     *Change of strategy and change in organizational architecture.*

Many companies take strategic decisions in order to keep their competitive advantages (Porter, 1985). These strategic changes can lead to change in organization structure and systems that are being used within an organization. The organization structure and the organization itself need time to change. Change as a result of strategy means that the organization needs to learn how to cope with new business and its processes resulting from new products or services that have emerged from the strategic change. This phenomenon already has been addressed in much research, early research already mentioned that recommendations can be inappropriate or even can lead to counter productiveness (Argyris, 1977). As throughout time accounting systems have become more sophisticated as a result of fast developments within computer technology and the expanding capacities of these systems, companies are forced to adopt these systems faster in order to keep up with their competitors. Although many systems can be bought 'of the shelf', companies need to learn how to use these systems and need to be aware what implications of using such systems are. Looking at accounting and information systems it has to be noticed that in the last two decades it are especially ERP systems that were introduced into companies and throughout this period these systems matured quite impressively.

Much research has been performed addressing factors that affect management accounting and control systems (MACS). In the field of management accounting research many methodologies are used. Gerdin and Greve (2004) shed some light on this by examine several papers that focus on management accounting research. In their

opinion two types of research paradigms should be identified by the researcher conducting research in this field. One purpose of this paper is to add to the limited knowledge in this area by examining which theoretical forms of fit have been used in the strategy-MACS literature. A second purpose is to review critically whether comparisons made between findings that are based on different forms of fit are valid. The strategy-MACS area was selected since it represents a stream of research in which various forms of fit have been used. Many studies have focused on several factors that have influence on management accounting within companies (Chenhall and Langfield Smith, 1998; Anderson and Young; 1999; Abernethy and Bouwens, 2005; Baird et al., 2007). Much evidence is found that these factors have an (moderate or high) impact on the MACS of an organization. One of the outcomes is that strategic choices which are made by a company will have an effect on their accounting processes. Early and recent research already has given insight on how a change of strategy can influence several aspects of MACS (Hopwood, 1987; Gosselin, 1997; Kober et al., 2007; Verbeeten, 2010). In these research projects, several aspects of MACS change are studied but a call for more research in this field is made by most authors. MACS innovation and related contextual and process factors are topics that need more research from an academic point of view, as well empirical research within practice. In their paper Kober, Ng and Paul (2007) call for more research using single case studies in order to get more insight in the interrelationship of strategy and management control mechanisms.

### 2.1.7    *Summary*

Literature shows that there is a relation between type of strategy and organizational structure. Throughout time the fit between strategy and organizational architecture is improved caused by incremental changes. However when radical change occurs, such as change in strategy, companies face the challenge to cope with the alignment of their organization structure. Change in strategy will lead to change in organization structure and this change can be influenced by several factors. The process that facilitates the shift from one configuration of strategy and organizational architecture to another is an area of research which received less attention. However, this process is important to

understand, as the change management process can be more effective once it is understood how change of strategy influences organizational change. The first research question in this thesis is:

---

*Research question 1: How does change of strategy influence change in organization architecture?*

---

## 2.2 Strategy and management information systems

### 2.2.1 *Introduction*

In the field of accounting research, relationship between MIS and organization structures and processes has been shown (Granlund and Malmi, 2002; Scapens and Jazayeri, 2003; Dechow and Mouritsen, 2005). These papers conclude that despite the fact implementation of ERP systems is increasing; little scientific evidence is available on the implementation processes and their effects on management accounting. In addition, it is claimed that neither a lot of attention is being given to this topic in accounting research journals. This section will address the relationship between strategy and MIS which is described in existing literature and identify where existing research regarding implementation of MIS is limited and therefore call for further research.

### 2.2.2 *Definitions strategy and Management Information Systems*

Once the strategy a company wants to pursue is defined and embedded within the organization, senior management should make clear what the consequences are for the different levels or business units within the company. In this respect strategy has come to be viewed as a crucial variable in the design of organizational structures and administrative processes (Dent, 1990). Corporate strategy can lead to different focus on this strategy within the company this strategy is implemented. As described earlier the structure of the company likely will change in case strategy changes. This means that the MIS within the organization will have to be changed on various levels

accordingly. In case companies have their business organized using multiple business units, it can occur that these business units will have to follow different strategy, resulting from the governing corporate strategy. In case a company wants to start up business in a new market segment, but wants to remain market leader in the market they are operating, it can be decided to follow a defender strategy in order to pursue cost leadership on one hand and at the other hand a prospector strategy in order to facilitate differentiation.

In this case managers from both units will need different steering information in order to implement their intended strategy and/or objectives. In their study, Abernethy and Guthrie (1994) attempt to improve the understanding of the factors which influence managers' choice of accounting and non-accounting information by developing a framework for assessing how strategic priorities influence the effective design of an organization's MIS. They state that performance will be enhanced when there is an appropriate match between strategy and the design of the MIS. They conclude that managers of business units pursuing a prospector-type strategy will view broad scope information as more important than managers in business units pursuing defender-type strategies. Similar findings have been documented by Jermias and Gani (2004); they indicate that product differentiation business units use significantly more total control than low cost business units. One possible explanation for this finding is that being more stable and less risky, low cost units may not require intense control as opposed to product differentiation units. This could imply that new business units within an organization might need a different approach on cost management. If the competences and the business practices within these business units differ from the traditional settings within a company, alignment of MIS should be considered. Earlier research, regarding implementation of MACS, looks at particular parts within MACS. For example, the way how cost management within organizations can be influenced by strategy and structure (Gosselin, 1997).

*2.2.3*     *Change of Management Information Systems*
Another finding in research by Gosselin (1997) is that the type of strategy an organization selects, establishes the need for innovation in the activity management

area. Organizational architecture influences the capability of an organization to implement innovations. If an organization decides to adopt another method of cost management they also should consider introducing an appropriate MIS. As these systems often are based on particular types of cost management (Granlund and Malmi, 2002), this system might help companies to support their strategic objectives. In that respect it seems that MACS support the change in strategy. This supports the view that, especially during strategic uncertainty, MIS and strategy act in an iterative manner: interactive use of MIS mechanisms helps to facilitate a change in strategy, and that MIS mechanisms change to match a change in strategy (Kober, Ng and Paul, 2007). Their study reveals that an increased use of results monitoring and cost controls in an interactive manner which facilitated a change in strategy. The introduction of interactive meetings on business and operational matters promoted inter-hierarchical communication and discussion, and lower level managers interacted with their superiors in the development of budgets and the monitoring of variances. These interactive activities fostered discussion and debate, and promoted an awareness of the financial environment. In this way, they helped to facilitate a change in strategy.

Information systems help to initiate or facilitate strategic change. By providing the relevant information, senior management will be able to judge if their strategic intentions are actually met. Previous research acknowledges this; however the focus of most of the empirical and case studies was on senior management - divisional heads, profit center managers and business unit managers - and on business strategy. This may be an appropriate focus, as it is these managers who usually formulate and often implement business strategy. However, the continued focus on senior management's use of controls could be misplaced. The success of a strategy may be directly influenced by activities that take place in other areas of the business, for example, at the operational, and research and development areas of the organization. The types of controls and the way that they are used by shop floor workers and their managers may be critical to the success of the strategy (Langfield-Smit, 1997). Therefore organizations need to be aware that once they change their strategy, the information that they need to monitor their intended change is obtained from the organization as a

whole. Once a strategy has been formulated people within the company should now what this strategy comprehends and which information they need to provide in order to create insight how the new strategy is being implemented. The information that needs to be provided can be diverse and originate from several parts within the company. Alignment of strategy and design of an information system and its outputs therefore is very important.

### 2.2.4 *Implementation of new MIS*

Implementation of new systems such as ERP often reveal the problems occurred by the change of MACS and organization as a result of strategy change. Although the ERPS is just a part of the total MACS, many companies struggle to align their ERPS with the envisaged MACS. An ERP-system is implemented by implementation partners that have their own implementation methodologies. ERPS implementation methodologies typically also include a business process development program (Business Process Re-engineering, BPR) that starts with an overall business process analysis (Granlund and Malmi, 2002). In other words during introduction of a new ERPS, companies are forced to clearly define their business processes. In case existing processes are used for a longer period, companies are well capable of defining these processes. However, when processes have to be changed or are rather new as a result of a new strategy, companies will have more difficulties in describing and indentifying new processes. Another important factor during introduction lies within the fact that an ERPS needs to have a fit with the organization. Earlier research suggests that ERP systems are a good fit with some organization types, but a poor fit with others. Organizations whose structures are a better fit with ERP systems are likely to have greater chances of successful implementations.

Organizations whose structures are a poor fit with ERP systems are likely to face organizational resistance to the systems and thus increase the chances of unsuccessful implementation (Morton and Hu, 2008). The people within this organization will have to deal with implementations. ERP systems force actors to go out of their way to solve problems and create solutions, and through their attempts to either work with the ERP system or to circumvent it, they show awareness of multiple ways that ERP systems

can act (Dechow and Mouritsen, 2005). It is suggested that implementation of ERPS (and change in MACS as such) is a process that evolves throughout time. The organization needs to adapt to the ERPS and vice versa. In their study Chenhall and Euske (2007) adopted a long-term approach which showed that MACS can experience a life-cycle that involves an initial birth stage, where it is embraced enthusiastically by designers, then the systems can suffer atrophy due to lack of benefits to users but still survive in an elemental form, and finally undergo a renewal stage. Because several factors seem to have an interaction which each other, it can be seen as an iterative process which is influenced by several contextual and process factors.

### 2.2.5    *Summary*

Management control systems provide information that is intended to be useful to managers in performing their jobs and to assist organizations in developing and maintaining viable patterns of behavior. Any assessment of the role of such information therefore requires consideration of how managers make use of the information (Otley, 1999). It has been suggested that the information systems should be tailored explicitly to support the strategy of the business to lead to competitive advantage and superior performance (Dent, 1990). Companies that need to change their strategic objectives should therefore be aware that their MIS should change as well. The second research question in this thesis there is formulated as follows:

*Research question 2:*        *How does change of strategy influence the change of Management Information System?*

## 2.3     Alignment of strategy, organizational architecture and MIS.

### 2.3.1     *Introduction*

Organizational structures and MIS have a strong relationship. The influence of change in strategy is likely to result in modification of both. Strategy has come to be viewed as the critical variable in the design of organizational structures and administrative processes (Govindarajan, 1988; Dent, 1990). Alignment of these elements therefore needs attention of senior management. As both elements interact with each other it can be imagined that this process can be extensive and will have a somewhat iterative character. Existing literature shows moderate attention to this phenomenon; therefore this section will discuss existing literature and identify the gaps where this case study can contribute to get more insight.

### 2.3.2     *Organizational architecture and MIS within MACS*

Management accounting and control systems cover a broad variety of processes and procedures within an organization. The definition of MACS has evolved over the years from one focusing on the provision of more formal, financially quantifiable information to assist managerial decision making to one that embraces a much broader scope of information (Chenhall, 2003). Many managers acting within a company need information on which they make their decisions. Not only financial information is being used for decision making, non-financial information is equally important to support their decisions. MACS provide this information on several fields of interest for management: accounting, finance, human resources, sales figures, cost management, risk management, performance indicators, supply chain, customer's information etc. In order to optimize the performance of a company, all available information should be used interactively, so it will have a broad benefit in manager's decision making. For MACS mechanism to be interactive that it must exhibit typical characteristics so managers can use this information adequately (Simons, 1995; Kober et al., 2007):

Organizations more frequently use ERP systems in order to collect such information. ERP systems combine business processes and IT technology of the implementing organizations in order to ease the flow of information through business functions.

Nowadays ERP systems provide the business infrastructure in a large percentage of organizations, and any change in business strategy needs to be supported by the ERP system. Thus, if a company decides to change its strategy due to pressure from competitors and intends to ensure that customers receive the products within a specified time, then it must make sure that the ERP system provides such information during the distribution process (Velcu, 2010). Many companies have chosen to introduce an ERP system in order to collect and analyze all this information within one system. Figure 2-1 shows an overview of what an ERPS system scope can comprehend.

## The Scope of an Enterprise System

An enterprise system enables a company to integrate the data used throughout its entire organization. This list shows some of the many functions supported by SAP's R/3 package.

**Financials**
Accounts receivable and payable
Asset accounting
Cash management and forecasting
Cost-element and cost-center accounting
Executive information system
Financial consolidation
General ledger
Product-cost accounting
Profitability analysis
Profit-center accounting
Standard and period-related costing

**Operations and Logistics**
Inventory management
Material requirements planning
Materials management
Plant maintenance
Production planning
Project management
Purchasing
Quality management
Routing management
Shipping
Vendor evaluation

**Human Resources**
Human-resources time accounting
Payroll
Personnel planning
Travel expenses

**Sales and Marketing**
Order management
Pricing
Sales management
Sales planning

Figure 2-1: Scope of ERPS (Davenport, 1998)

Enterprise wide resource planning systems (ERP systems) attempt to integrate all corporate information in one central database, allowing information to be retrieved from many different organizational positions, and in principle they allow any organizational object to be made visible (Dechow and Mouritsen, 2005). Figure 2-2 shows a schematic lay-out of how an enterprise system is being build up.

## ANATOMY OF AN ENTERPRISE SYSTEM

At the heart of an enterprise system is a central database that draws data from and feeds data into a series of applications supporting diverse company functions. Using a single database dramatically streamlines the flow of information throughout a business.
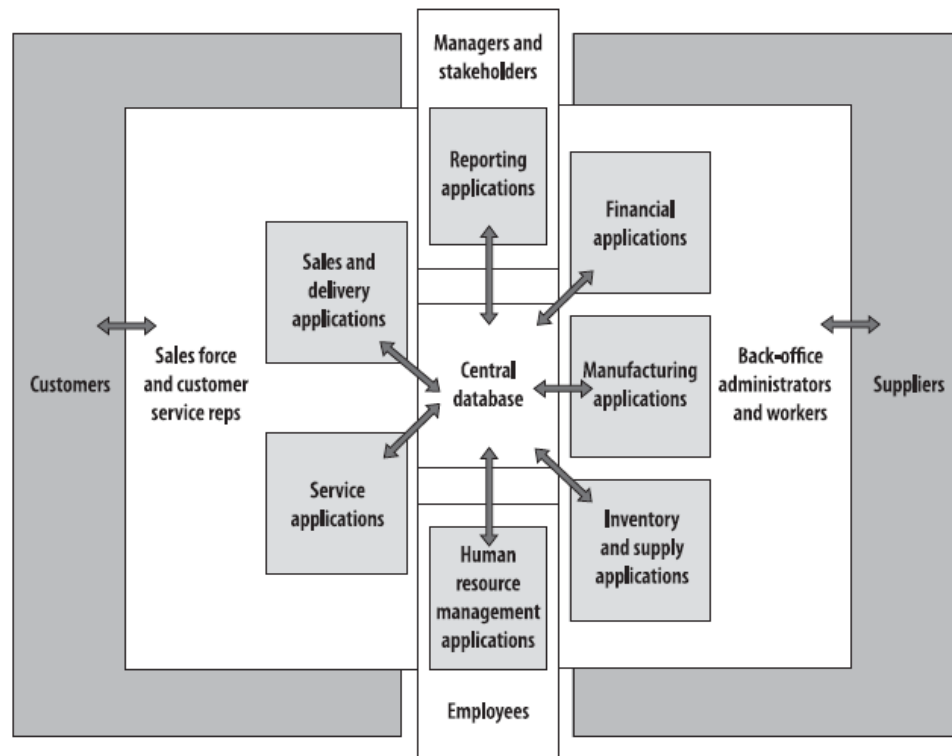


**Figure 2-2: Anatomy of ERPS (Davenport, 1998)**

Clearly, ERPS offer the potential of big benefits. But the very quality of the systems that makes most benefits possible - their almost universal applicability – also presents a danger. When developing information systems in the past, companies would first decide how they wanted to do business and then choose a software package that would support their proprietary processes. They often rewrote large portions of the software code to ensure a tight fit. With ERPS, however, the sequence is reversed. The business often must be modified to fit the system (Davenport, 1998). The organization striving for successful use of ERPS should be well aware of this finding. Alignment of strategy and the MACS/ERPS a company is using will benefit from these systems. ERP systems may make an increased contribution to business performance when

implementing companies strive for alignment between their strategic needs and the ERP system (Velcu, 2010). Alignment can be obtained by a thorough assessment of the current and the new business models an organization has identified. As the need for organizational change, and the strategic interest in an ERP implementation, increases, a more iterative implementation model can be expected. In this approach, all the possibilities of an ERP system are thoroughly checked for their potential contribution to the business strategy.

It is not to be claimed that ERPS have an impact on MACS as such. In their paper Granlund and Malmi (2002) suggest that there has been no major direct or indirect impact so far by ERPS on management accounting and management control systems of a firm. Though in a couple of cases some changes have taken place with regard to organizational autonomy and responsibilities, these changes have not led to changes in the logic of the management accounting and control techniques in use. It appears that so far, the greatest benefits of the new systems for accounting imply enhanced mass processing of documents. This thesis will not address the impacts of ERPS but merely look at how ERPS (MIS) is changed as a result of alignment between change of strategy and organizational architecture.

2.3.3    *Alignment of organizational architecture and MIS.*

Once it is decided to introduce a new ERPS, companies generally start implementing the system as soon as possible. Implementations are large investments and the benefits should be available as early as possible. Research shows that ERPS introduction can be an endless process, influences organization structure and –ideally- needs to follow a learning curve (Quattrone  and Hopper, 2001; Kalling, 2003; Quattrone  and Hopper, 2006; Dechow and Mouritsen, 2005). The fact that ERPS is forcing companies to write down their procedures and processes makes implementation of such a system a difficult task. Often an ERP-system is implemented by implementation partners that have their own implementation methodologies. The implementation is typically organized around the modules of the system to be implemented (Granlund and Malmi, 2002). Next to the fact that this re-engineering of processes and procedures are not always that easy to describe, ownership and responsibility related to these processes

and procedures need to be identified as well. Implementation of ERPS has multiple stakeholders and all of them have their interests in what the system should accomplish in order to support their needs. It seems straightforward that companies should choose an ERP package that matches organizational strategy, architecture, and culture. However, there may be different motivations for different project stakeholders in the organization. Yet, there is a top level motivation that should serve as a control for the management of the project (Velcu, 2010). However, in this study it was concluded that the motivation for implementation was found not to be significantly associated with the management of ERP projects. There is another aspect in the motivation of projects: the combination of human and political issues, which result in competing motivations. Morton and Hu (2008) suggest a similar finding: ERP systems are a good fit with some organization types, but a poor fit with others. Organizations whose structures are a better fit with ERP systems are likely to have greater chances of successful implementations.

In addition to having important strategic implications, ERPS also have a direct, and often paradoxical, impact in a company's organization and culture (Davenport, 1998). It could occur that the envisaged changes in the MACS by implementing ERPS are not met, but have a contradictory effect. This can result in unwillingness of the people involved, as the systems they were used to work with are no longer valid and may have to be reshaped in order to align them with the ERPS. Introduction of ERPS should therefore be well prepared and supported by higher management. As ERPS will show the flaws in the existing system, the organization likely has to change: even if people involved will not like it. These organizational changes can frustrate the introduction of ERPS. Therefore management's attention should focus to the importance of recognizing and addressing the issue of fit between organizational architecture and ERP package. Organizations implementing ERP must consider the fit with their structures, the consequences of changing their business processes, and the potential resistance from within (Morton and Hu, 2008). Both organizational change and ERPS implementation can be a time consuming process, therefore the interface between these two processes will lead to a long exposure to each other. In other words,

during the implementation of ERPS the organization is likely to change. This can be directly related to each other, but other factors can play a significant role in this as well. Therefore it will be useful to set out a timeline in which the ERPS implementation will have to be executed. Velcu (2010) states that a company implementing an ERP system: (1) may need to make changes to its business processes and procedures, (2) customize the ERP system, and (3) become dependent on the ERP vendor for support and updates. The first two characteristics apply to the project stage of ERP implementation; the third applies for the whole ERP lifecycle. The business process changes resulting from the ERP system customizations need to fit the organizational processes to the ERP system, and may be critical in successful use of the ERP system after its go-live stage. During the implementation process changes in the organization and its processes need to be identified. As a result of these changes it is possible that that change in the ERPS implementation will have occur as well. How organizational changes influence ERPS introduction is a field of research that has not been explored that frequently. Companies need to align the several factors as described above; the process that will facilitate this is a topic on which more research is needed.

### 2.3.4    *Organizational change*

Many aspects concerning change within organizations have been addressed. In their paper Armenakis and Bedian (1999) conduct a review of several studies concerning organizational change. They discuss four research themes or issues common to all change efforts: first content issues, which largely focus on the substance of contemporary organizational changes; secondly contextual issues, which principally focus on forces or conditions existing in an organization's external and internal environments; thirdly process issues, which address actions undertaken during the enactment of an intended change, and finally criterion issues, which deal with outcomes commonly assessed in organizational change efforts. Another field of research within the organization change studies focuses on radical and incremental changes that occur within organizations. Damanpour (1991) describes that researchers have proposed differences between predictors of the adoption of radical and incremental innovations. Managerial attitude toward change and technical knowledge

resources have been expected to facilitate radical innovations, whereas structural complexity and decentralization should lead to incremental innovations. In addition he claims that the importance of the distinction between radical and incremental innovations also lies in the probable differential contribution of the two types to the effectiveness of an adopting organization. The above implies that companies should identify which changes occur and why they are occurring. Aligning organization and information systems will most likely follow an incremental change process, as organizations that adopt a new configuration of these two elements will have to follow a learning process. Within this iterative process changes in organization will lead to changes in the information systems and vice versa.

2.3.5    *Resistance to change*

Organizations whose structures do not fit a certain MIS as a result of change in strategy are likely to face organizational resistance to alter the system and thus increase the chances of unsuccessful implementation (Scapens and Roberts, 1993). This so called misfit is brought to the surface during introduction of ERPS within an organization. The introduction of ERPS itself reveals many flaws in an organization's processes, accounting methodology and management responsibility (Scapens and Jazayeri, 2003). It is of high importance that both these factors are well aligned and that management should be empowered in order to successfully implement ERPS (Kolehmainen, 2010). An organization will try to fix these flaws in the organization's processes, accounting methodology and management responsibility, as it will benefit not only their ERPS introduction, but also their entire business processes in the near and longer future. It can be expected that change in these processes will lead to interference with the rules and routines people have within a company and thus can lead to resistance within an organization. This phenomenon should be addressed prior to the implementation process (Abernethy and Bouwens, 2005), because this resistance will reveal itself throughout the introduction of a new system. Scapens and Roberts (1993) study the resistance to accounting change within an organization. They conclude that an understanding of accounting (and information system) change requires an understanding of various organizational and historical contingencies.

Organizational practices evolve out of the interplay of a whole set of disparate influences as well as the intentional actions of organizational members. In other words before a new system has to be implemented, the implementation partners and the involved company stakeholders must have a clear view on how an organization acts and how this organization has created their business models and processes throughout time. In addition it is claimed that it is important not to dismiss resistance as illogical and emotional. Resistance is probably informed by a whole variety of very real concerns and fears, and attempts to use coercion to overcome them may lead to contest of control and yet further resistance. It is only by exploring and the organizational and historical contingencies which influence the process of accounting change that the resistance can be understood (Scapens and Robert, 1993). Existing literature shows that resistance to change and how employees deal with this introduction of new MIS (such as ERP) is especially encountered during the implementation phase (Swan, Newell, & Robertson, 1999; Hong & Kim, 2002; Lee & Myers, 2004; Benders et al.,2006). As roles within the organization will change, people will dislike the fact that certain rights and privileges are shifted or become more transparent to the rest of the organization. Despite this resistance a company will have to deal with the fact that these changes occur and should focus on the lessons learnt during implementation processes. The relationship between organizational learning and management control systems is both recursive and two-way, with the two concepts inextricably interwoven. The constructs associated with generative or double loop learning utilize certain processes which are known to accountants as part of a system of management control. Management control systems affect the perception of the environment, and generative learning is a response to perceived changes in the environment. Management control systems affect the understanding of what those changes mean, how and what solutions might be generated, and a perception of whether the time has come to uncouple the organization from old structures and operating paradigms to move to new structures and paradigms. In addition, as the organization learns and changes, it may change its structures and its control systems to accommodate the changes (Kloot, 1997).

Facilitating this change process and organizational learning therefore needs to be addressed and conceptualized prior and during the change process. One aspect is that the more an ERP system strategy is aligned with the business strategy, the more likely that the ERP project will be completed on budget and on time. In the long run, changes in business strategy must be coordinated with those available in the ERP system (Velcu, 2010). In the end improved organization architecture and information systems (MACS) should lead to an improved fit with the intended strategy. Issues that occur during the change process can lead to different outcomes. Outcomes may be separated into issues related to the use or usefulness of the MACS, behavioral and organizational outcomes. There is an implied connection between these outcomes. If the MACS are found to be useful then they are likely to be used and provide satisfaction to individuals, who then presumably can approach their tasks with enhanced information. As a consequence, these individuals take improved decisions and better achieve organizational goals (Chenhall, 2003).

*2.3.6*    *Summary*

Organizational architecture and MIS such as ERP have a tight relationship. Within a stable organization the alignment between strategy, organizational architecture and MIS can be gradually improved, as the organization will adjust these systems as a result of their experience and lessons learnt. However, once it is decided to follow a different strategy, organizational architecture and MIS may need a major change. Before a company decides to do so, it not only needs to think about the design of these systems, but also on how these changes will have to be implemented. This results in the third research question in this thesis:

*Research question 3:*    *How can organizations align their change of organizational architecture and change of Management Information Systems as a result of change in strategy?*

During process of aligning organizational architecture and MIS people will be confronted with change in their working environment. Resistance to this change is an aspect that needs attention during these processes. Senior management of companies that are facing implementation of new systems and structures, need to think about a proper implementation strategy in advance. This will lead to a higher chance on successful implementation and establish the benefits companies foresee when formulating a new strategy. Final research question in this thesis is:

*Research question 4:*     *What change management strategy can be used to facilitate alignment of change in strategy and change in organizational architecture and information systems?*

## 3    METHODOLOGY

### 3.1    Introduction

This chapter provides insight into the methodology of this study. It describes the methods used to answer the question: *How is the alignment between change of organizational architecture and change in Management Information Systems as result of change in strategy achieved?*? Each relationship within the research model - which is formulated as a proposition – is described in the previous chapter. For this purpose a case study approach will be used. The case study is a research strategy which focuses on understanding the dynamics present within single settings (Eisenhardt, 1989). Empirical research within a single company using a case study will allow testing the propositions within a single setting within the context this company is operating. The data that will be reviewed within this case study originates from the announcement date of the new strategy till present. Analyzing the data will give insight on how the alignment of change in organizational architecture and MIS as a result of strategic change is achieved.

### 3.2    Research Method: Case study

This thesis uses a case study approach to investigate factors that influence organization architecture and ERP introduction caused by change in strategy. The case study is a way of investigating an empirical topic by following a set of pre-specified procedures (Yin, 2003). Case studies typically combine data collection methods such as archives, interviews, questionnaires and observations (Eisenhart, 1989). As a form of qualitative descriptive research, the case study looks at a single organization, drawing conclusions only about that organization in that specific context. Yin (2003) describes case studies as a plan that gives guidance to the process of 'collecting, analysing and interpreting observations'. The outcome of the study is a feasible 'model of proof' that allows conclusions to be drawn about the causality between variables. Case studies are of empirical nature and allow researcher to investigate certain phenomena in a real life setting (Yin, 1981). Different types of case study research exist. Yin (2003) separates two types of case studies, namely single- and multiple-case studies. Within these

typologies another distinction can be made between exploratory, descriptive and explanatory research. Exploratory research is aimed at discovering new research questions. Descriptive research is aimed at describing a certain phenomenon and explanatory research answers the question how certain phenomena occur, based on the intertwined nature of the constructs (Yin, 2003). A case study is in fact not a specific methodological choice, but can be considered a choice of what is studied. It is often concerned with how (descriptive) and what (explorative) questions (Yin, 2003).

Case studies come with some advantages being a part-time graduate. Access to data and the management of a company that employs me is fairly easy. Conducting the field research within the setting that is familiar to me provides me a broad insight in the context the company is acting. A disadvantage however is: being part of the organization of research can cause several biases (eg. selection bias) and a certain level of cognition. For this thesis research methodology and theory (rigor) have been obtained by the courses attended at the RSM. My daily work and the obtained experience (relevance) contribute to link between the academic know how and the practical know that. Bennis and O'Toole (2005) emphasize the importance of this cross reference as they also believe that field research involves the study of practices in their natural setting, which facilitates the generation of relevant theory. For these reasons an increase has been seen in the use of field research in the field of accounting during the last decennia. Field studies are especially effective for building theory, particularly through early exploratory investigations where the phenomena are not well understood and where relevant variables and relationships might not even be indentified or conceived yet Field research might yield new ways of classifying phenomena, richer explanations of why or how certain phenomena occur, or explanations as to why outcomes will differ in a new setting that has never been carefully studied (Merchant and van der Stede, 2006).

The theory building principle from case study emphasizes that the researcher should constantly compare theory and data – iterating toward a theory which closely fits the data. A close fit is important to building good theory because it takes advantage of the new insights possible from the data and yields an empirical valid theory (Eisenhardt,

1989). The processes are similar to traditional hypothesis testing research. However these processes are more judgemental in theory-building because researches cannot apply statistical tests (Eisenhardt, 1989). When investigating one or some cases however, the results are not as representative as when statistical research is performed. This can be a major disadvantage of a case study compared to for example a survey.

Field research is not a panacea; it has some significant inherent limitations, which other methods can help overcome. For example, field researchers generally require the cooperation of the practitioners whose behaviours are being studied, and that cooperation is not always forthcoming. Field researches have to guard against the possibility of observational biases of various types (Merchant and van der Stede, 2006).

Given the fact that there is a vast amount of empirical evidence showing influence of strategy onto MACS and organizational architecture, the research questions regarding these two aspects can be answered and the results of this case study can be benchmarked with the existing literature. The amount of literature regarding the introduction of MIS and the relationship with strategy change is limited and therefore this case study can lead to some new theoretical insights. By using a deductive approach the research questions are derived from existing literature and will be used in the data collection process in order to test if this particular case has similarities with previous findings or will reveal new insights. Data gathering will be performed using a qualitative approach, which seems contradictory with the deductive character of this thesis. However, in the field of management research, mixed method approach is used and suggested more often (Scapens, 1990; Dul et al., 2010; Modell, 2010). By using this mixed method approach findings will be derived from the empirical data. This thesis will show two types of findings, first the described interplay between strategy and MACS within existing literature will be compared with the findings obtained from the data collection. Second, more insights regarding the interplay between strategy, MACS and the introduction of a MIS could be obtained as the existing literature regarding this phenomenon is limited.

This thesis follows the theory-building case study process proposed by Eisenhardt. Since the adopted single-case design does not enable any cross-case analysis, it does not provide precise theoretical propositions. Rather, it presents empirically grounded reflections and new theoretical insights (Eisenhardt, 1989). Using a single case study method leads to results that are not as representative as when statistical research is performed; no governing theory will be derived.

## 3.3    Research Context

Dockwise Shipping is an organization that found its origin in 1993. Main business of the company consisted of ocean transportation of extreme heavy and/or large cargos. The company has a versatile fleet which has been extended throughout the years by more mergers and acquisitions. At a certain moment the company was market leader and almost had a monopolistic position. This led to high margins and a well occupied fleet schedule. In the recent years competition came up, management recognized the threat and decided to expand the competences of the company in order to diversify their portfolio. The vessels owned by Dockwise are very suitable to perform offshore installation of large oil and gas processing modules. Therefore, it was decided to expand the competence of Dockwise with marine contracting activities. Another competence which had to be developed was logistical management, in other words: transport the load and manage the complete project from A to B, including on- and offshore transportation. Figure 3-1 shows the change of portfolio given over the year 2007 to 2010. Before 2007 no distinction between the three segments was mentioned, as all revenue came from Heavy marine Transport .The strategic choices lead to substantial growth of the organization. Before the company was able to perform its business with 50-70 fte's, nowadays over 350 people are working at the company.

In addition it was decided to implement a new ERP system. In the same period as described above, steering committees, consultants and a project team were mobilized in order to implement the new system. During this process a lot of issues were exposed, procedures were not in place, processes did not match reality, and departments had different and/or conflicting interest. In the meantime the company encountered some

radical changes as well. Changing ownership, a merger, listing on two exchanges and acquisitions made the company larger and caused many changes in the organizational structures. Despite the many events and the financial crisis of 2008, the company continued to develop and even increased their revenues and utilization of its fleet. Although this achievement did not call for drastic changes, the call for re-organizing the company remained, as the portfolio of the company was changing. In particular the diversification between shipping and contracting needed a different way of structuring the company and a change in management steering information.



HEAVY LIFT REVENUE
- T&I, offshore and onshore
- Dockwise Yacht Transport
- Drilling rigs, military, PMI and various

Fig: Percentage of Dockwise heavy lift revenue per segment

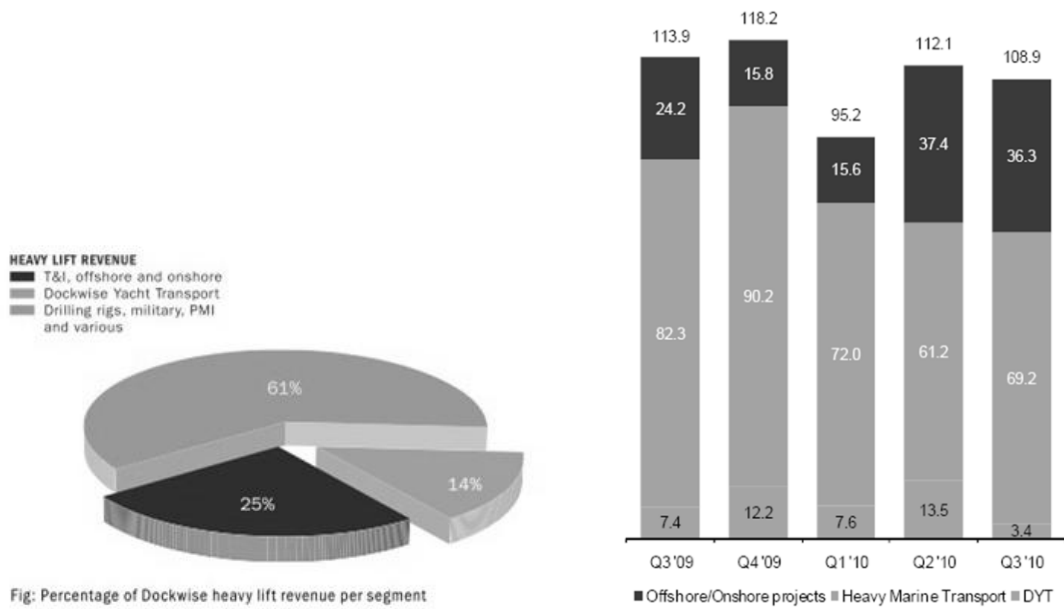■ Offshore/Onshore projects ■ Heavy Marine Transport ■ DYT

**Figure 3-1: Revenue split 2007 vs. 2010[4]**

---

[4] Source: Annual report Dockwise 2007 and investor relations presentation October 2010.

## 3.4 Research Design

Regarding the field research, a qualitative approach has been taken. Because of the richness of the context, the study cannot rely on a single data collection, but will need to use multiple sources of evidence (Yin, 2003). The data collection was carried out by interviews with senior management, front line managers, SAP consultants and employees within the finance and accounting department of the targeted company. In addition relevant documentation, such as minutes of meeting, management statements and implementation plans regarding strategy and ERPS introduction, has been studied.

### 3.4.1 *Data Analyses*

In order to analyze the data firstly the data has been structured along the timeline in which events occurred that influenced strategy, organizational architecture and introduction of a new MIS within the company. This timeline will give an overview of the occurrences that happened and in which order. Each event logged in this time frame is documented in particular reports that are archived per event. These documents provide the data that were analyzed by using a labeling method, in other words the terminology that links to strategy, organizational architecture and MIS. This first analysis provides me the relevant information which has been used in order to select interviewees that have been involved in the implementation of the strategy change and MIS introduction. In addition the interviewees have been selected within a hierarchal level as well, this provides me the insight on how the changes were envisaged by senior management and how middle and lower management experienced and acted on the initiated changes. Another aspect that has been considered in selection of the interviewees is the period when they were employed by the company. Opinions and vision of people before the strategic change are likely to be different of the people that are employed after the changes as they have a certain unbiased vision on the new envisaged business model of the company.

Tuning the data collected from the interviewees with the timeline that marks the events of the company leads to the insight on how certain decisions lead to a change in another process (strategy, organizational architecture and MIS). The chronological

occurrence of events gave insight in the processes that took place within the company and also provided insight in the amount of re-implementing/ re-engineering of the implementation strategies.

From the results gathered in the interview round, the relation between the pattern of change in strategy, change in organizational change and change in MIS, could be explained and the answer to the research questions could be given. The results lead me to formulate the findings concerning these relationships and how they interact with each other.

3.4.2    *Data collection*

The data used within the case study was gathered between March 2011 and May 2011. Theme interviews with corporate, business area, and employees provided the primary source of field data. The specific (secondary) data related to the strategy and ERPS introduction goes back to 2006, this date the new strategy was introduced to the company, and ends at April 2011. The corporate-level managers who were interviewed represented key corporate functions, such as corporate strategy, finance & control and strategy, while the business area and front-line managers represented key business areas and horizontal organizations. Altogether, 9 interviews were conducted (see Appendix B). The interview time was 45-60 minutes averaged and the data collection during the interviews consisted of taped interviews and participant observation. These tapes were immediately transcribed after the interviews and were sent for validation to the interviewees. Interviewees were first approached with open questions. For example, interviewees were asked to provide their views on 'how management control systems are used for strategic alignment'. They were then asked more specific questions relating to strategy, organization architecture and MIS. Specifically they were asked how they experience the introduction of these items and how it influenced their business processes. Since data analysis proceed in parallel with data gathering, it was possible to pose increasingly specific questions and probe deeper into initial ideas as the project and the data collection progressed. Interview data was complemented with relevant internal documents, such as process descriptions, implementation if strategy and ERPS related documentation and consultancy reports. The interviewed people had

the most accurate information about these processes. The face-to-face interviews undertaken in the context of this research made use of both forms of open-ended questions – that is: open and probed questions. The open questions encouraged interviewees to provide their opinions and ideas, which were then followed up by probing questions, focusing on the specific aspects.

A variety of public documents - for example, analyst presentations, minutes of meeting, progress reports - were also drawn upon. Finally, informal discussions with key informants enabled the researcher to engage in more general discussions regarding company's management approach and the informants' involvement in the strategy and IS introduction, provided me a platform for more detailed questions. Appendix A provides an overview of the data used in this study. The analysis involved several iterative rounds of comparison between data and theory, as well as the triangulation of data from different sources.

## 3.5    Triangulation of results

Data collection in this case study is mainly obtained by conducting interviews. In order to validate the findings from the interviews and to provide a well structured and valid case study and its findings, data triangulation has been used. Triangulation is the use of multiple sources of data, different research methods and/or more than one researcher to investigate the same phenomenon in a study. This can reduce bias in data sources, methods and investigators (Jick, 1979).

The accuracy of findings from a case study can be increased by using different types of data about the same phenomenon. Triangulation of sources has been achieved by member checking and consulting secondary information sources such as reports regarding introducing strategy and MIS, minutes of meetings of the progress meeting concerning the introduction process and other relevant internal publications. Conducting member checks helps to establish credibility. It is in this step that the members of the setting being studied have a chance to indicate whether the reconstructions of the researcher are recognizable (Lincoln and Guba, 1985).

Furthermore the data from secondary sources like the implementation progress reports are considered to be less subjective than the interviews and provide a good accuracy check of the findings obtained from the more subjective interviews. An additional check on data will be done by me, as I am a part of the organization. Remarks made by interviewees can easily be verified by the researcher as I am well familiar with the context in which this research is conducted and I know where to find the minutes of meeting or reports where statements are documented.

## 3.6    Validity and Reliability

To evaluate the quality of the empirical research, several concepts have been proposed. According to Yin (2003), four different tests can be used to evaluate the quality of any empirical social research such as a case study, namely construct validity, external and internal validity, and reliability. The four conditions related to a research design are important to guarantee the design quality (Yin, 2003).

### 3.6.1    *Construct validity*

Construct validity concerns to what extend what was to be measured was actually measured in the research. In a case study this is challenging as constructs are a set of concepts or general notions and ideas a person has in his or her mind about certain things (Collis and Hussey, 2009, p. 191). In addition the findings are strongly related to the context of the environment where the data has been obtained. By thorough literature review, definitions of the research topics can be made on which the questions used in the interviews are based. Once the data has been gathered, the use of these definitions will be used to analyze the data. By formulating several possibilities that are similar to the definitions, measuring of findings can be achieved and be compared with the intentional search for the research topics.

### 3.6.2    *External validity*

The external validity deals with the problem of knowing whether a study's findings can be generalized beyond the immediate case study (Yin, 2003). External validity thus describes to what extent the findings of one study are applicable and therefore can

be generalized to other cases. This case study focuses on mid-sized (employees 100-500, revenue up to 500-750 million dollar) companies that are facing substantial growth and diversification in their portfolio from which they have the potential to become a large public company. This makes it difficult to actual select a group of companies, as much information needed in order to label them might be seen as strategic information that a company is not always willing to make it public.

Lack to generalize findings from a case study is one of the most prominent critiques on case studies. However, Yin (2003) argues that those critiques arise when comparing case study research to survey research. While surveys rely on statistical generalization, case study research relies on analytical generalization; the researcher's aspiration is to generalize a particular set of results to some broader theory (Yin, 2003). A case study can rely on analytical and theoretical generalisations, although no statistical generalisation can be made.

### 3.6.3    *Internal Validity*

Since our knowledge of a construct can only be as good as the measures we use to examine it, it is essential to evaluate the "validity" of these instruments – not only for their statistical performance, but perhaps more importantly for how well they reflect the conceptualization of the construct, with due consideration to its subtleties (Eisenhardt, 1989). To meet the test of construct validity, Yin (2003) state that the following two steps must be covered:

1. Select the specific types of changes that are to be studied (and relate them to the original objectives of the study) and;
2. Demonstrate that the selected measures of these changes do indeed reflect the specific types of change that have been selected.

The internal validity of this thesis is ensured by the fact that the source of the questions (asking the right questions) within the interviews and the indicators used in the data analyses originated from a thorough literature review. The literature provided

the insights and research questions related to the three main topics within his research: Change of strategy, change of organizational architecture and change of MIS.

### 3.6.4     *Reliability*

Reliability is accounted for through the use of formal case study protocols and the development of a case study database. It demonstrates that the operations of a study – such as the data collection procedures – can be repeated, with the same results (Yin, 2003). Another approach is that research must also provide its audience with evidence that if it were replicated with the same or similar respondents in the same (or similar) context, its findings would be repeated (Lincoln and Guba, 1985, p. 290). The goal of reliability is to minimize the errors and biases in a study. To contribute to the reliability, different techniques like data collection and interviews are used. Where within the case study results show similar outcomes, the findings will be more robust (Yin, 2003). With the aim to gather accurate data a protocol (Appendix B) has been used that allowed me to interview the people within the company. This protocol was based upon findings and measurements that are mentioned in previous research. Recording all interviews and making literal transcriptions of these interviews to make sure that I can quote the interviewees correctly preserve the reliability in this research even more.

# 4    RESULTS

## 4.1    Introduction

In this chapter the results from the desk study and the interviews will be described and analyzed. First of all the events will be described separately, the last section of this chapter will discuss the data obtained in the research and focus on the generalizability of the results by comparing the findings with the literature review. Combining the data from the desk study and the interviews for each part of the theoretical model will lead to answers on the research questions.

The data will be analyzed by looking at events following a timeline in which several events occurred within the organization, starting from the company's initial intention to change the strategy of Dockwise. Figure 4-1 shows the timeline and the main events that occurred from the first moment of the intended strategy change till May 2011. Quotes showed in this chapter are a small selection in order to enrich the text. Reference is made to Appendix C, where a complete overview of relevant quotes can be found.
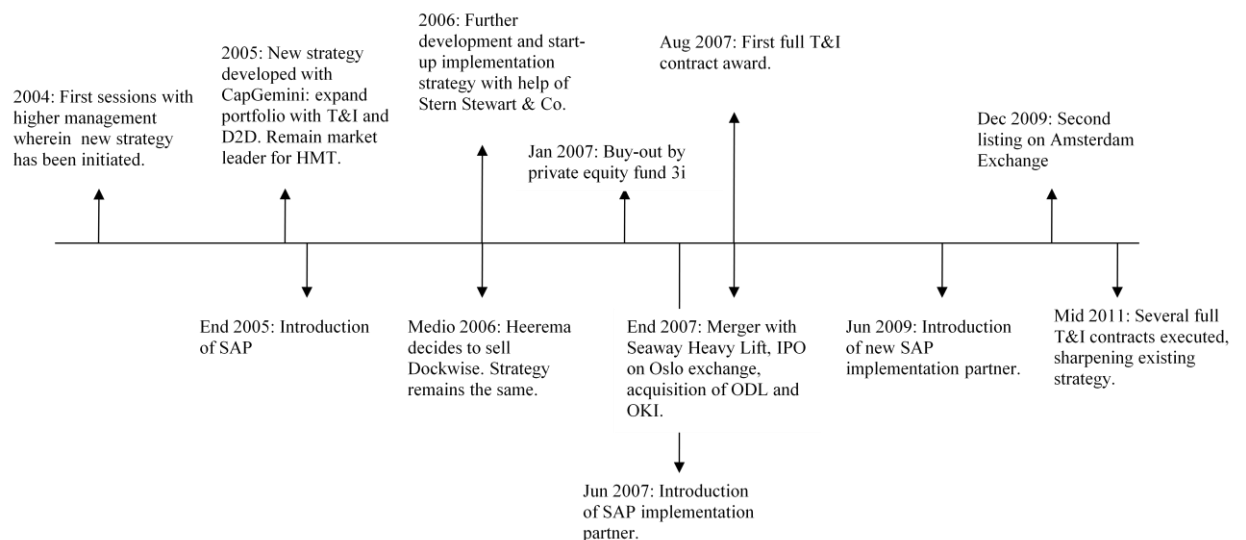


**Figure 4-1: Chronicle overview of events.**

## 4.2      Change of company's Strategy

### 4.2.1     *Reasons for strategic change*

In 2004 management of Dockwise already acknowledged that they had to define a new strategy in order to increase the long term viability of the company. During that period Dockwise was owned by Heerema. This company owned large crane vessels that are capable to install topsides of a weight up to 11,500 metric tonnes. However, installing heavier topsides (up to 25,000 metric tonnes) required another installation method. Installing such heavy topsides in one go required a float-over methodology. This method uses barges or vessels that have the capacity to load, transport and install the topsides. Dockwise owned these types of vessels and thus differentiating the portfolio by entering this market seemed a logical step. Another development management envisaged was to be a player in the so called 'Door-to-door transportation' segment. This meant that cargos not only would be transported from A till B, but the overall management and logistics would be covered within these contracts as well. Especially in the LNG market large opportunities existed in this field of business: large refineries that will be built in remote places. These so called 'door-to-door transportations' were renamed to logistical management (LM) projects.

The HMT division of Dockwise was leading the market. The company owned and operated a fleet of 20 vessels. As a result of differentiation advancements the company was able to offer a unique service. For this service a price-premium could be charged towards their clients. In that time, the competition intensified, during the last 10 years a considerable increase in new built heavy lift vessels took place. Due to this growth in supply of heavy lift vessels, the prices became under pressure. As the market was maturing, it was not expected that the high premiums would return. Growth in the oil- and gas industry was still sustainable (especially the Far East and Brazilian market), which will lead to steady revenues and market share for the coming years. In order to compete with new entrants the company had to lower its prices.

> *"In our lower segment these barriers are actually quit low: buy a tanker, modify it for a couple of million and you can start your business. For the higher segment more money is*

> *involved, but there are plenty companies that can cough up the necessary investment in order to built a competitive vessel". Interviewee E, 6-April-2011.*

Another reason for the company to alter their strategy lied in the fact that Dockwise faced the problem that their core competence – Heavy Marine Transport – was heavily depending on the oil and gas investment cycle. This meant that once the oil price was rising, oil majors would intensify their drilling activities in order to produce more oil. These drilling activities needed drill rigs that had to be transported around the globe. Such transportations were one of the cash cows of the company. A disadvantage of this business line was that when the oil price dropped, drilling activities and the amount of movements of drill rigs will reduced as well.

> *"The disadvantage of HMT is that it follows a very cyclical trend-line. […]. This is something we do not like: following a jigsaw shaped trend line. […]. But what we now experience are a couple of years of increasing revenues and all of a sudden a fall back in revenue." Interviewee C, 8-April-2011.*

By differentiation of the portfolio, the company would be less dependent on the earlier mentioned investment cycle. Aligning the business with the total oil and gas business model will mean a more sustainable business model in which revenues are more evenly spread throughout the years. In order to align the business model with the oil and gas production cycle – exploration, development & production and processing – the company defined their strategy given in Figure 4-2.
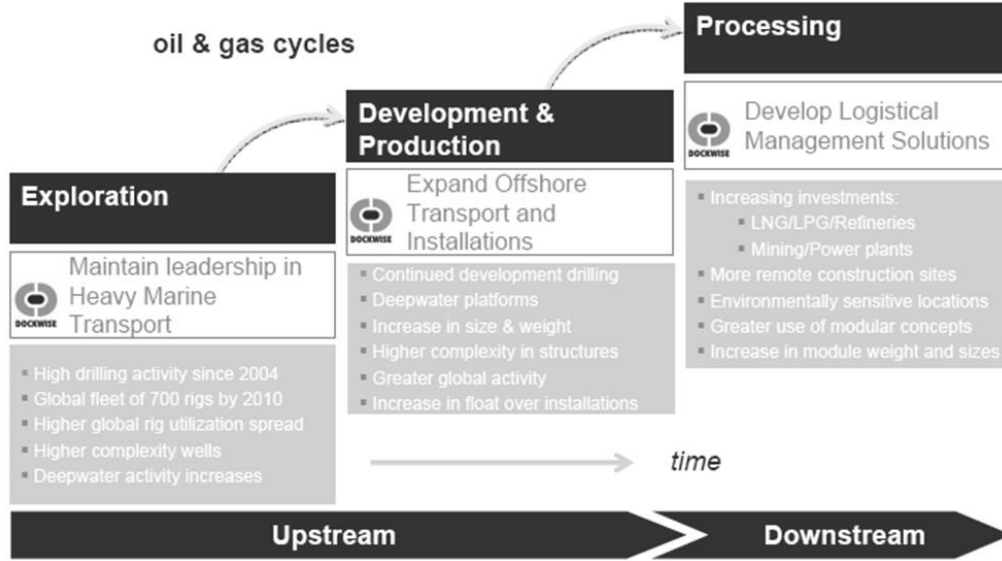
**Figure 4-2: Strategy Dockwise[5]**

Finally the company looked for increase in revenue. This would enable more possibilities for the company to invest in new vessels, increase the return on investments for shareholders and improve the long term visibility of the company with a better position in the marine contracting segment. In case the portfolio would be limited to the HMT activities, the revenue that could be generated would be more or less capped (20 vessels with an X-amount of day rate leads to revenue of 20 times X times 365 days). As the rates were heavily depending on the market circumstances, it very well could mean that after some years with a well occupied fleet and high prices, less favorable years could follow, resulting in a significant decrease in revenues. This trend could be limited by adding more scope in the portfolio of the company that would be less dependent on the vessels' day rates.

### 4.2.2    *Defining the new strategy*

In order to define Dockwise' new strategy, management organized strategy sessions with all the employees (at that time approx. 70 fte). Together with Cap Gemini the possibilities were explored and documented. From these sessions it was clear that the envisaged strategy as proposed by the board was underwritten by all employees. In the

---

[5] Source: Dockwise Investor Presentation, October 2009, www.dockwise.com.

next phase Stern Stewart & Co. was introduced to the company. In order to meet the strategic objectives it was assessed how these strategic choices could be enabled. Reports from Stern Stewart & Co. indicated what the company had to do in order to facilitate the new identified business models (Transport and Installation (T&I) and Logistical Management (LM)). These reports contained basic assumptions regarding required competences; amount of fte's and key decisions that had to be made by senior management, in order to meet the strategic objectives. To implement the strategy it was decided to fist have the focus on expanding the T&I activities.

> *"In addition we already we identified that the existing organization was not up to speed with the envisaged strategy. [...]. Within the organization there were people capable of doing so, but not everybody. Therefore we designed an organization chart in which we defined the position and amounts of people we thought that would be necessary in order to execute the new strategic objectives. [...] those disciplines did not exist before that time". Interviewee C, 8-April-2011.*

Implementation of the new strategy just started when Heerema announced its intention to sell the company. This had an impact on the pace of the strategy implementation, because the focus of the company shifted towards selling the company. Nevertheless implementation of the strategy continued and it was discovered that the corporate strategy itself had a good fit with the oil and gas business model. However, it was considered to specify a strategy for the three separate business models, as these divisions operated in a different market with another level of maturity. This meant that the strategy had to be redefined for the individual business lines.

> *"Within HMT we are definitely not cost leader, we are more the premium player in the market. [...]. For T&I we are a low cost provider, but not because of the fact that we actually perform these contracts on low cost, but we are innovative in how to execute these contracts. [...]". Interviewee E, 6-April-2011.*

Another event that took the focus off the implementation process was the merger with Sealift Ltd. and the IPO that came along with it. Becoming a public company had a lot of effect on the organization and the attention of higher management. Despite the

external events, the backlog[6] of the company slowly experienced a shift in the distribution of revenue. The revenue from the T&I contracts was increasing and the revenue from HMT seemed to stabilize. This indicated that the chosen strategy was validated; however the revenue generated from the LM projects seemed to stay behind.

## 4.3    Change of company's Organizational Architecture

*4.3.1    Reasons for change in organizational architecture*

When the company was owned by Heerema, the core business of the company existed of HMT and these activities were a cash cow for Heerema. High results were achieved with a fairly small and flat organization that was designed for a shipping company. The fact that Dockwise almost could act as a monopolist made business fairly easy and straightforward. The contracts were based on a standard contract (BIMCO), which was accepted throughout the industry. Once the feasibility of the transport was checked by the engineering department, the contract could be signed and transferred from the sales department towards the operational department. The operational department prepared the transport by performing some additional engineering and ordering materials to secure the load during transit. Finally the transport was executed and a new cargo was already booked so the process started over again. These processes were highly standardized and were executed by a limited amount of people.

> *"...we had a fairly small organization based on our core business. For example: positions like control did not exist. At least not per project, we had one corporate controller. When we started formulating our strategy we knew that we could keep the existing line organization for HMT purposes." Interviewee I, 18-April-2011.*

With the new strategy in mind, management was well aware of the fact that a new organization structure was needed to execute larger contracts. Because these projects had more complexity in the sales and operational process, more specialized staff was required to facilitate this. In contradiction to the HMT segment, a large variety of contract forms are used in the marine contracting segment. The scope of work per

---

[6] Backlog: the total value of sales orders waiting to be filled. Increases or decreases in a company's backlog indicate the future direction of sales and earnings. Source: www.investopedia.com, 7-11-2011.

project often varies per client and therefore often need a custom tailored contract. In order to win these contracts the sales department had to be changed: people with the right competences to manage these tender processes and the knowledge of how business is done in this segment. In order to execute large projects, more disciplines were needed as well. Instead of handling these contacts using the existing departmental organization, new project related disciplines were needed in order to focus and have commitment on a single contract. In addition subcontracting and hiring temporary personnel were needed in order to execute parts of the scope of work in which the company had no assets or knowledge. The fact that the new market segment generates a substantial amount of scope increase meant that the competences and the knowledge within the organization had to follow as well.

Changing the organization and the positions within this organization also led to change in accountability and responsibility of employees. When projects had to be managed within another structure, the responsibility and accountability had to be delegated to the persons that where dedicated to manage these projects. When the same resources are being used by two different divisions, there could be a potential conflict of interest. In order to facilitate the needs from both divisions a new organization structure had to be introduced in which roles and responsibilities had to match the needs from both organizations.

> *"Directly after the decision was made to change the strategy we decided that we needed more disciplines in house in order to make it work. We did not have project managers for example. So we looked for experienced Project managers, we organized our risk management; we hired project engineers in order to cope with the differentiation in engineering capabilities". Interviewee C, 8-April-2011.*

Another aspect that is causing a need for change in the organization lies within the fact that the company changed from a privately owned company towards a listed company. During the time that the company was owned by Heerema the financial reporting was substantially less sophisticated than the requirements of listing on stock exchanges brings along. This had mainly consequences in the MIS, but it needed an organization that will provide, maintain and support this system.

*"The IPO has been underestimated by management in sense of the fact that it needs a huge effort from an organization to get this realized. In addition you are faced with governance, compliance, reporting obligations, etc. If this company had been a private company for another 4 years, it would have been much easier." Interviewee E, 6-April-2011.*

### 4.3.2     *Organizational Architecture*

Restructuring the organization was envisaged by higher management during the definition of the new strategy. In the first documents (Stern Stewart & Co.) that described how to implement the new strategic goals it was already indicated that the organization should consider the implementation of project management. This meant indirectly that the company faced a considerable growth in personnel.

One recommendation that had been followed by the company was to divide the sales department in three segments that were identified during the design of the new strategy. By dividing the sales department in HMT, T&I and LM disciplines, the organization was able to develop their own selling strategies and the resources and competences that go along with these different areas. Also opening more foreign sales offices made it possible to get more exposure to the new potential markets.

Another important change was to introduce a project management department and the adoption of a project management philosophy in order to execute the new T&I and LM contracts. Next to the line management based organization a project management organization was established. The combination of these two organization structures led to a matrix[7] based organization in which resources were shared by both project managers and department managers. This inevitable led to an increase of friction between the people involved as the responsibilities and accountabilities shifted from one organization to another.

---

[7] Matrix organization: An organizational structure that facilitates the horizontal flow of skills and information. It is used mainly in the management of large projects or product development processes, drawing employees from different functional disciplines for assignment to a team without removing them from their respective positions. In this structure conflict of interest will occur as resources are being used by different departments, where roles and responsibilities differ from each other. Source: www.businessdictionary.com, 7-11-2011.

*"[…] In my opinion HMT is typical line management and a standardized business model. Projects are never the same and that is why you need a project management orientated organization." Interviewee A, 20-April-2011.*

In order to get more insight in how the processes within HMT, T&I and LM internal change management projects were initiated. These projects should make clear what the change meant with respect to accountability, responsibility and to what extend the incentives, rewarding and authorities of people should change. The introduction of project management implied that new positions within this discipline had to be facilitated as well. Building a project management organization means that several supporting functions such as administration, control, scheduling and other disciplines needed to be introduced. In 2005 the first project was being executed using the project management methodology. It immediately gave insights in the problems that go along with introducing project management into a traditional, functionally structured organization.

As a result of these changes it became clear that the amount of employees had to expand significantly. This would not only be achieved by expansion in the head quarters of the company (Breda), but also existing foreign offices had to support the growth that was foreseen. In order to expand the competences and the capabilities of the company it was also decided to acquire two companies that had the necessary engineering competences for the new business lines and the proper fabrication skills for specialized offshore equipment needed to install large topsides.

*"[…] the organization structure has been changed, more foreign offices, project management organization, project support office is introduced, reimplementation of SAP, introduction of NAVI, appointing process owners. We are not there yet, but there is a systematic way of thinking these days on how we need to change the organization in order to match the strategic objectives. Structure follows strategy…." Interviewee E, 6-April-2011.*

In order to manage this increasing amount of employees and the expanding of the foreign offices implied that establishing a new organization structure had high priority. Authorizations, responsibilities and reporting methods had to be re-designed to meet the new requirements. The hierarchy levels increased and the executive committee was extended with two additional positions.

## 4.4 Change of company's Management Information System

### 4.4.1 Reasons for MIS change

Before the strategic change, management needed to report monthly figures to Heerema which was a straightforward exercise. The revenues and costs had to be reported to the corporate controller of Heerema and the figures were incorporated in the consolidated balance of the Heerema group. Because Heerema was a privately owned company the information needed by the owner could be reported once a month, using little documentation. This was acceptable for a privately owned company, but when Dockwise was bought by a private equity fund (2007), the requirements on management reporting drastically changed. These requirements even became more stringent after the IPO (2008).

> *"It has been improved drastically: the organization changed and the setting changed. It used to be more of family business, the CEO had a small talk with the owner and that was enough. This is not the way you can manage a listed company […]." Interviewee E, 6-Apri-201l.*

Next to the financial reporting, both financial and management accounting as well as the non-financial information changed drastically as well. As a result of new organization structures, new positions and the fact that the company entered a new market segment, better information regarding operational progress, competitor information and KPI's on newly introduced processes was required.

> *"[..] you need to check if your strategy is successful and to monitor if the methods you are using in order to implement the strategy are effective. Therefore you will need to know what the characteristics and criteria of the strategy are, so you can define KPIs within several processes in order to measure if this is actually the case." Interviewee B,22-April-2011.*

Another reason why the requirements for the MIS changed was because the organization experienced a considerable growth in employees (from 70 fte in 2005 till 300 fte nowadays). In order to manage these people, more management layers and departments were created. The company went from a small line organization to a more mature organization in which a more hierarchal model had been introduced. Managers from different departments needed different steering information, especially when they are operating in a different segment (HMT, T&I or LM). During the implementation of the strategy an increase of several systems had been noticed, in addition management already decided to introduce a new ERPS (SAP). Reason for introducing the ERPS was not only because this was initiated by Heerema, but also because of the fact that the new system had to cope with the envisaged need for different and more detailed information.

### 4.4.2    *Introducing a new MIS*

Besides several smaller systems that were introduced to gather data (small databases, excel files, Colibriweb, Principle Toolbox, etc.) the main system that was foreseen to support the new strategy was the ERPS 'SAP'. The introduction of this system already started under the management of Heerema. Once Dockwise was sold (2007), the company owned an ERPS which was based on the principles of Heerema. After some time it was discovered that this blueprint of the ERPS did not match the desired purpose of the company.

> *"We introduced SAP in order to manage the larger projects. We realized that we had to implement SAP – or another ERPS – in order to facilitate the new business. The mistake we made is the fact that we thought that we could copy SAP from the former owner (Heerema)[...] but in end that was a major misconception."Interviewee C, 8-April-2011*

In order to align the ERPS with the business models that the company was pursuing, management decided to hire an implementation partner that was instructed to adjust the system in such way that it would have a better fit with the existing processes. At the same time an internal change management project was started up that had to define the blueprints of the system. This project team existed of employees from several departments who had the objective to define their processes and the requirements for

the system in order to support these processes. After quite some time and investments it was concluded that the chosen approach was not meeting the objectives. The implementation partner followed a strategy in which the systems had to support the existing and developed processes. They tried to achieve this by re-programming the existing modules within SAP in order to match the existing systems and processes within the organization. The results were disappointing, progress was slow and the associated costs were increasing.

> *"We started to design our own system, but we slowly discovered that our competitors used systems that already had proven themselves. What I have experienced is that certain companies within the industry have comparable organization structures and systems. […] So in that respect we should have looked at our competitors as well." Interviewee A, 22-April-2011.*

At a certain moment higher management decided to end the contract of the implementation partner and decided to look for another one. In the meantime the processes that had been set-up by several departments showed some significant differences between the existing HMT business line and the new T&I and LM business lines. The reason for the difference lied within the fact that projects have to be executed more autonomously. This meant that parts of the authorities and liabilities of existing management positions had to be shifted to the project managers and therefore the management information streams needed to change. In basic the data from which the information origins stayed the same, but the aggregation levels differed.

> *"[…] a manager that is running the project needs other information than the manager that is looking if the projects in general are profitable. In the end it is all a matter of aggregation. […]. What we need to be aware of is that these levels need to show one truth […]" Interviewee E, 6-April-2011.*

In the second implementation process another approach had been chosen to introduce the new ERPS, based on lessons learned from the first session. With the new insights regarding the difference in aggregation levels and the shift of roles and responsibilities, the new implementation partner used another approach during the second

implementation process. First the processes were re-defined and once these had their first blueprints, KPI's were identified in order to provide the information that was needed to manage these processes. One process was deliberately split into HMT and T&I/LM. The reason for this was that the processes within these three business lines showed some resemblance, however the amount of information that was needed to manage these processes called for a different set-up. The next step that was taken was to identify which processes could be supported by the standard modules that SAP already had available. In case the existing information systems were too company specific, it was decided to keep the existing systems and to design interfaces between SAP and these systems.

## 4.5 Company's 'alignment strategy'

At the beginning of the new strategy implementation management laid down the blueprints for the implementation strategy and acknowledged that the organization and the MIS had to be aligned with the new strategic goals. Using consultants and implementation partners helped the company to get better insight what the best methodology would be in order to meet the objectives set by higher management. Less attention was given to the fact that, in case the organization had to be changed and all systems used within this organization, the change of these topics had a strong relationship or impact on each other. Introducing project management into the organization was something that was acknowledged by higher management; however the consequences that resulted from such change were underestimated. In general it was assumed that introducing project managers and systems like SAP and project related software (Primavera, Principal Toolbox) would be sufficient to manage projects in the new segments. In addition, reality showed that the interaction as a result of organizational change, introducing a new MIS and shifting responsibilities, led to resistance within the company.

> *"By redefining processes of the departments, people will be confronted with consultants who are implementation project members that start interfering with their method of working. When change occurs, the first reaction of people is that they dig their heels in. And they will not cooperate till the moment that they are truly convinced. […]. This is related with the*

> *personal interest people have and the politics that are present within an organization."Interviewee B, 22-April-2011.*

Nevertheless, much effort was put into the implementation of the new strategy, using consultancy companies like Stern Stewart & Co. During the first phase of the implementation process a lot of attention was given to introduce project management and implementing SAP. This combination turned out to be difficult, as the implementation of SAP forced the company to have clear processes and related responsibilities. The processes that were related to project management were not matured yet, which caused problems in defining the blueprint for the processes that had to be supported by the ERPS. When processes for the new segments (T&I and LM) were designed, it turned out to be that the organizational architecture needed to be revised again and vice versa.

After the strategy implementation was started in 2004-2005, the company faced the event that Heerema decided to sell the company (2006). This had a major impact on the introduction programs that were at hand at the company. The focus of higher management shifted towards this event and lead to a large claim on the organization's resources. The events associated with the selling of the company followed each other up rapidly and even more attention of higher management was claimed by these events, despite the fact management had thought of several theories and initiated projects to facilitate the strategy and MIS implementation.

Once the company was sold and was listed via an IPO, the attention of management was more focused on the implementation of the strategy and ERPS again. Although the listing claimed quite some efforts from the company as well, the implementation processes entered a new phase in which a new implementation partner was introduced as well. Originally this implementation partner had the objective to introduce SAP, but it soon was decided that they needed to manage the change process as well. In the meantime criticism about the need, fit and convenience of SAP was increasing, but it never lead to the intention of not introducing the system.

*"The possibilities of SAP were presented nicely and it was promised that we would have one touch on the button and than we would have all information available.......we are 5 years underway now and I still cannot get the data I want from the system. I am convinced that if we took more time to investigate in the possibilities, it would have been different these days."Interviewee I, 18-April-2011.*

In the second implementation phase it was decided to re-engineer the business processes in order to have a better match with the ERPS. In order to facilitate this initiative, the project NAVI was started up in which dedicated people were assigned to describe the five main processes as identified before. In the second phase more emphasis was put on the fact that the organization structure had to be changed and that the MIS to support this organization had to follow. This project team was advised by a steering group consisting of members from higher management. In addition the company faced higher demands in external reporting as a result of the two listings, which meant that more requirements were enforced upon the new ERPS system.

At the moment of writing this thesis, the alignment of strategy, organizational structure and the new ERPS are still ongoing. A lot of progress has been made and some elements are on the verge of being completed. Nevertheless, a lot of issues still need to be resolved. However, after the hectic years in which the company was sold, changed ownership and was listed, it seems that the attention from higher management is shifting back to the strategic objectives again. Although many still doubt if this process will ever end, the organization is adapting to the requirements that have been developed from project and processes that were started in order to implement the new strategic objectives.

## 4.6     Discussion

In this section the outcome of the results in comparison with the literature review will be discussed.

Table 4-1 summarizes suggested fits regarding strategy, organizational architecture and MIS based on the findings from the literature review and the response from the interviewees.

| | Corporate | HMT | LM | T&I |
|---|---|---|---|---|
| **Strategy** | Differentiation / Prospector | Cost Leadership / Defender | Differentiation / Prospector | Differentiation / Prospector |
| **Organizational Architecture** | | | | |
| *Performance measurement* | Net Profit, EVA | Fleet Utilization, EVA, low SG&A | Positive Project Result (Budget vs Actual, EVA) | Positive Project Result (Budget vs Actual, EVA) |
| *Performance evaluation* | Stock Price | Low cost | Executed contract within: time, budget and quality | Executed contract within: time, budget and quality |
| *Partition decision rights* | Executive Committee; Vice Presidents | Vice Presidents, Department Managers | Project Managers | Project Managers |
| **MIS** | | | | |
| *Information level* | Low detailed level: ROI, EVA, General Ledger level | Medium detailed level, Sales Price – COGS – Margin | High detailed level, (nearing) Activity Based Costing | High detailed level, (nearing) Activity Based Costing |
| *Recording of information* | Aggregated information on monthly basis | Weekly reporting | Weekly reporting, booking actual on a daily basis (possible) | Weekly reporting, booking actual on a daily basis (possible) |
| *Analyzing level* | Financial Accounting | Management Accounting | Management Accounting | Management Accounting |
| *Reporting* | Quarterly and annual reports | Monthly reports | Monthly reports, weekly highlights | Monthly reports, weekly highlights |

**Table 4-1: Overview strategy, organizational architecture and MIS.**

*4.6.1    Strategy and organizational architecture*

The change of strategy that has been initiated by Dockwise inevitably has lead to changes in the organizational architecture. All interviewees acknowledged that differentiation of the company's portfolio has lead to many changes in organizational structures, additional foreign offices and allocation of management decision rights structures. By entering the T&I and LM markets the need for improvement or creating new competences (Porter, 1985) was clearly visible. However, as the corporate strategy follows a differentiation strategy, it is questionable if the new business segments (T&I and LM) have to follow a same strategy as the existing one (HMT). Results from the interviews and the desk study show no clear distinction between the strategies that are followed within these business segments. The fact that this decision has not been made, makes it hard to determine which organization structures need to be designed. Research has indicated that there is a relationship between the type of strategy that is followed and the organizational architecture that needs to be considered and implemented (Miller, 1986; Simons, 1987; Jermias and Gani, 2004; Chenhall, 2003). Following different types of strategy within one company is possible in case the divisions are acting in another market segment and have a different maturity within these market segments.

In case of Dockwise it can be concluded that the existing core business is HMT and that this business model has matured during the last years. For this business model the company has the right competences and the organization structure to achieve its objectives. As a result of the growing global competition, the HMT segment needs to find an effective way of achieving competitive advantage and improve its organizational performance (Baines and Langfield-Smith, 2003). Building a new unique vessel that is larger than any existing semi-submersible vessel, HMT can defend its competitive advantage at the high end of the market.

The new business lines are more or less a result of the strategy that the company initiated. In the last few years the company struggled to define the right competences it needed in order to facilitate the execution of the new type of contracts. Despite the fact

that the intended strategy was very well formulated and it also turned out to be a right decision – right fit with the market developments - the actual implementation of the strategy and its consequences have been facilitated less efficiently. Adding more diverse competences and experienced employees to the company became more difficult as the financial crisis lead to disappointing results.

In addition, the adoption of the 'proper' MACS needs to be considered as well. As a result of the new business lines the MACS has been re-designed in order to fulfill the needs for the larger projects that are being executed in the T&I and LM segments. Changing the MACS did not benefit the HMT segment, because another organizational architecture is needed to match the strategy that is followed within the HMT segment. By focusing too much on the MACS that is needed to support the new business lines, it seems that some elements are inappropriate and even lead to counter productiveness (Argyris, 1977) as the amount of resources and systems involved in the fairly straightforward HMT contracts are becoming too much.

In the new business lines it is clear that another strategy has to be followed. As the company has not matured yet in this segment of the market, it needs to invest in a new organization and its MACS. By introducing new foreign offices, splitting the sales department in different segments and the introduction of project management made clear that another organizational architecture was envisaged. Introducing these changes had also consequences for the accounting processes, organization structures, decision rights, accountabilities etc. (Hopwood, 1987; Gosselin, 1997; Kober et al., 2007; Verbeeten, 2010).

### 4.6.2 Strategy and Management Information Systems

Reasons to alter the MIS as a result of strategic change are at first sight similar to the reasons that lead to change in organizational architecture. In addition, change in organizational structures lead to change in MIS as well. The fit that is needed between strategy and MIS therefore is dependable on how the company has organized itself. In the case of Dockwise it seems logical to organize HMT differently than the T&I and LM segment and within these to business models other management information is

needed as well. Strategy can be viewed as a crucial variable in the administrative processes (Dent, 1990). Managers within the new business lines are looking for other steering information than the managers in the HMT business line. This is a result of the different type of strategy that is being followed in these business lines. This is validated by the interviewees and the documentation regarding the blueprints that had to be made for the ERPS implementation: because the T&I and LM segments are not that matured yet, the need for a broader scope of information is higher in these new segments. This matches earlier research in which it is stated that following different type of strategy will lead to the need for more control and information (Abernethy and Guthrie, 1994; Jermias and Gani, 2004). Alignment of MIS has been acknowledged by the management of the company; the competences and business practices within these business units differ from the traditional settings of the company (rf. Gosselin, 1997) and therefore re-engineering of the MIS was essential.

The introduction of the new ERPS taught the company that the processes and the information needed within the different business units highly differed from each other. This was a result of the overall business analyses that had to be conducted in order to achieve a proper introduction of the ERPS (Granlund and Malmi, 2002). Another aspect that came to the surface is that the changes in organization caused changes in the design of the MIS as well. During the introduction of the ERPS the organization faced some changes caused by this process as well as by external factors such as a merger, acquisitions, an IPO and a cross listing (all result of the new strategy). During these events the MIS had to change, but also provided the information that caused the changes. In this respect the lifecycle of the MIS went through the initial birth stage in which the blueprints were created and the basics of the system were designed and during the renewal stage improvements were made to the system in order to meet the new requirements of the system (Chenhall and Euske, 2007).

### 4.6.3    *Alignment of Strategy, Organizational Architecture and MIS*

At the time the strategic objectives had been set by higher management in cooperation with all employees, management of Dockwise was well aware of the fact that the company needed to change several aspects in their way of doing business. Early in the

process it was acknowledged that the organization had to expand their competences and in order to achieve this people from other companies operating in the industry where Dockwise wanted to expand – marine contracting – wire hired. In addition several internal projects were initiated in order to get more insight on how the organization had to be re-designed. Basically the main targets within these projects were: introducing a project management based organization with support from the existing traditionally hierarchal organization and continue with the implementation of the SAP system to provide the right management information. Although the objectives set by management were clear, the process on how to implement these two major changes into the company and align this with the strategy has been given less attention. This implied that the introduction of the ERPS faced the problem that no thorough assessment of the current and new identified business models (Velcu, 2010) had taken place and thus alignment was difficult to achieve. According to Granlund and Malmi (2002) it is not to be said that ERPS have an impact on MIS, but the management information needed in order to support the different business models can be easily accessed and generated once the ERPS is properly implemented.

A second dilemma that the company faced lies in the fact that the change in organizational architecture had severe impacts on how the MIS had to be designed. In the early days it was mainly the employees from the existing business unit that were involved in shaping the MIS. This worked out fine in order to design the MIS for the HMT business line, but the lack of knowledge regarding project management based working practices caused some gaps in management information that had to be generated as well in order to support the new business lines. Enforcing the new way of working caused the effect that people became reluctant to the system and structures. An effect of introducing the new system is that existing processes had to be modified in order to meet the system, eventually causing potential resistance to this change (Davenport, 1998; Morton and Hu, 2008).

A preliminary conclusion could be that not enough attention has been given to the implementation strategy – aligning strategy and MACS – by the management of the company. However, this would be a conclusion that would be drawn too easily. As

Mintzberg claims that strategies could be deliberate or emergent. In Mintzberg's paper (1985) it is described that the effects of these types of strategy can heavily influence the way management implements strategy change. In this case study it is obvious that the management had a clear definition and objectives when the strategy was set out. In that respect the strategy of Dockwise could be labeled 'deliberate'. Throughout the years, many external events took place which had an impact on the strategy implementation and indirectly on the alignment of strategy and MACS. Defining strategy as intended and conceiving it as deliberate, as has traditionally been done, effectively precludes the notion of strategic learning. Once the intentions have been set, attention is riveted on realizing them, not on adapting them. Messages from the environment tend to get blocked out (Mintzberg, 1985). In case of Dockwise the development of the strategy was managed well. Despite the fact that the company faced some turbulent times, the implementation of the strategy always had high priority. However, the external events did distract the attention of management on the implementation process itself. It seemed that organizational learning regarding the implementation process slowed down and could be an indication why the alignment between strategy and MACS takes more time than initially assumed.

# 5    CONCLUSIONS

## 5.1    Introduction

The interplay between strategy change and organizational architecture and the alignment of strategy change and MIS have been central issues in much research (Miller, 1986; Hopwood, 1987; Dent, 1990; Ittner and Larcker, 1997; Gosselin, 1997; Chenhall, 2003; Kober et al., 2007; Naranjo-Gil and Hartmann, 2007; Verbeeten, 2010). The interplay between changing strategy, alignment of change in organizational change and the alignment of the change in MIS has been studied less. The implementation process that needs to be followed in order to support the interplay between these three topics received less attention as well. The dynamics that go along with this interplay between strategy, organizational architecture and MIS were investigated within this research.

## 5.2    Contributions

### *5.2.1    Influence of strategy change on change in organizational architecture*

This case study shows that once companies introduce new strategies that have an effect on business unit strategies and their MACS (Kober et al, 2007; Verbeeten, 2010), these companies are not always aware of the fact that this can lead to different type of strategies within these business units. Introducing change in organizational architecture based on the corporate strategy therefore can lead to difficulties in the alignment of organization structures within and between the business units.

Another effect that has been showed in this case study is the indirect influence of other factors that resulted from the change in strategy that influenced the organizational architecture. Realizing the strategy change caused the company to expand their portfolio and growth of the organization. Mergers, acquisitions and an IPO as a result of the strategy change forced the company to restructure their organization as well (Skaerbaek and Tryggestad, 2010). This in combination with the search of the proper fit between strategy and organizational architecture leads to an excess of variables that need to be addressed in order to achieve proper alignment of strategy and

organizational architecture. It is recommended that these variables need to be prioritized so the dynamics in the events that will occur can be managed accordingly. By addressing the implications in the correct order managers will be more capable to achieve the right fit between strategy, organizational architecture and MIS. Existing literature acknowledges this, however it are mainly he direct influences that are highlighted in these studies. The indirect influences and the interplay these factors have on each other are showed in this research.

### 5.2.2 *Influence of strategy change on change in MIS*

The results of this case study indicate that reasons to change MIS as a result of strategy change likely origin from the same reasons that have been encountered when looking at the influence of strategy change on organizational architecture. It can be concluded that MIS has to follow and support the strategic objectives. MIS comprehend a number of systems that need to provide the information to management in order for them to make the right decisions so the strategic objectives can be achieved. In this case study the introduction of an ERPS showed the implications the company faced in aligning the MIS with the change of strategy. Strategy showed to be a crucial variable in the design of the MIS (Dent, 1990; Otley, 1999). Performing business in multiple business models/units leads to a different need of steering information for these business units (Abernethy and Guthrie, 1994).

In this research it has also been found that executing projects in a new market segment forces companies to alter their MIS, as the information needed in order to be competitive in this market segment differs from the information needed for the existing competences. The difference between line management versus project management and financial accounting versus management accounting are not fully developed within the organization. The introduction of the ERPS made the flaws in business processes visible and caused re-engineering of the existing and new business processes and methodologies. The fact that no clear decision has been made on how to design the implementation process learned that aligning the MIS with strategy needs to be approached with adequate processes within the organization; otherwise implementing ERPS will not succeed. In line with Davenport's (1998) finding, the

processes that have been established will need to have a fit with the envisaged ERPS. When this has not been performed appropriately, resistance of employees towards the system will increase.

This case study confirms the findings of earlier research, the way implementation of MIS interacts with other implementation processes such as strategy and organizational architecture and how this should be aligned has is a finding that contributes to the existing literature. The fact that the dynamics in this interplay show an iterative character cannot be concluded from this single case study and therefore could be a topic for future research.

### 5.2.3    *Dynamic interplay*

In this case study, evidence has been found that alignment of the three elements can be an endless exercise, as long strategic objectives are not clearly defined. Throughout the implementation phase the company faced many external factors that influenced the strategic setting the company had set. Assuming that once the strategy has been formulated, the organizational architecture and the MIS can be designed will only have a positive result once the strategic objectives are well defined and commonly understood. This implies that when companies face these alignment challenges, clear communication on how these clear defined strategic objectives will be implemented, need high attention of managers. Once the strategic objectives and the implementation strategy have been stipulated, confusion or distraction during the dynamics of the alignment process can be mitigated or even be avoided.

It also has been found that changing circumstances affecting the strategic objectives will cause another change in organizational architecture and design of MIS. It seems that once the organization has aligned its structures with the information flows and formats, a reconsideration of the strategic objectives can be made: does the change in strategy still holds once new information and insights are obtained after changing the structures and information systems? In addition this research showed that the dynamics that occur after changing the company's strategy are mainly found between the alignment of organizational architecture and design of a new MIS. Changing MIS

and introducing new organizational architecture can be managed in a combined effort; however it has to be noted that the introduction of a new MIS only will be successful in a framework where the strategic objectives have a certain level of maturity.

This case study also showed that if communication within the organization regarding this topic is insufficient, employees could be reluctant to facilitate the alignment and the implementation process will be delayed or even become a failure. Therefore it can be concluded that internal communication regarding strategic objectives and the process that should align strategy with organizational architecture and introduction of a new MIS is essential in order to successfully implement the new strategy, organizational architecture and MIS.

Finally this research showed that the aligning process has an iterative character. During the implementation process certain gaps between alignment of strategy, organizational architecture and MIS were identified. These gaps lead to re-engineering of the processes and the systems that needed to support these systems. In this process new insights were obtained on the design of organizational architecture and MIS. In a few cases it meant that earlier changes in the organization structure and systems had to be fine-tuned with the new insights.

Table 5-1 shows the gaps within the alignment of strategy, organizational architecture and MIS that were indentified during this study. It is recommended that once companies face change in organizational architecture in combination with introduction of a new MIS as a result of strategic change, companies will have to invest time to identify the type of strategy management envisages and indentify the structures and systems that will have the best fit with the types of strategy.

| | Corporate | HMT | LM | T&I |
|---|---|---|---|---|
| **Strategy** | Fit | Fit | Poor Fit | Poor Fit |
| **Organizational Architecture** | | | | |
| *Performance measurement* | Fit | Near Fit | Poor Fit | Poor Fit |
| *Performance evaluation* | Fit | Poor Fit | Near Fit | Near Fit |
| *Partition decision rights* | Fit | Fit | Poor Fit | Poor Fit |
| **MIS** | | | | |
| *Information level* | Fit | Fit in current setup, No Fit with cost leader | Poor Fit (improving) | Poor Fit (improving) |
| *Recording of information* | Fit | Fit | Near Fit | Near Fit |
| *Analyzing level* | Fit | Fit | Poor Fit | Poor Fit |
| *Reporting* | Fit | Fit | Fit | Fit |

**Table 5-1: Overview fit strategy, organizational architecture and MIS**

It is recommended the management of Dockwise will have to address the 'near fit' and 'poor fit' items first prior to continuing the alignment strategy. It is important that decisions regarding type of strategy, organizational structures and management information flows are well defined and communicated properly. By doing so, the alignment process will be less sensitive for other external factors that could influence the implementation strategy. In this case the 'near fits' could be solved easily by sharpening the objectives that are foreseen within strategy, organizational architecture and MIS. The 'poor fits' need to be addresses by senior management as soon as practically possible. It seems that lack of decision making at a higher level within the company causes too many objectives to achieve a proper alignment of strategy, organizational architecture and MIS within the three business lines that are envisaged within the company. For example: management needs to decide (and state) which strategy they follow per business line and along match the organizational architecture and the design of their MIS with this intended type of strategy. As earlier research shows; a prospector type of strategy needs a different way of organization structure and the steering information than the cost leader type of strategy.

The dynamics that occur during the alignment of the implementation processes (strategy, organizational architecture and MIS) is a topic that has received little attention in the existing literature. It is acknowledged that all components by itself influence the company's internal structures and processes, however the iterative character of the alignment strategy that has been showed in this case study is a finding that can be a topic for future research. Much research looks at the separate events in a somewhat 'static' mode, in other words for example change of strategy leads to change in MIS. This case study shows similar results, however in addition this case study reveals that it is the period after the event that caused the change and the interplay between the components that needs to be managed.

## 5.3    Limitations and future research

Case study research can have a limitation in itself, based on the fact that it is very time consuming, research must be rigorous, drawing conclusions needs care and skilful interviewers are necessary (Voss et al., 2002). The author did the analysis of the obtained data in this study only and therefore subjectivity can play a role in the interpretation process. However, several validation methods like member checks have been conducted in this research. By consistently structuring the process of data gathering, codifying and analyzing it is believed that good interpretation of raw data is sufficiently guaranteed (Eisenhardt, 1989). In addition to the general limitations of a case study, this research project has been conducted at only one organization, with the aim to investigate the organizational search processes into detail. However, a focus on one specific organization can create a bias for the outcomes of the study.

This study focused on the changes in strategy, organizational architecture and MIS and it only can be stated what happened within Dockwise. This case study concludes that strategy has an influence on the organizational architecture and MIS. However, it is difficult to separate several what impacts are caused by a certain event. It can be questionable if all factors that influenced change in organizational architecture and MIS are a direct effect of the strategy change. During the timeframe of this case study, many events occurred in the external environment of this company (sale by Heerema,

merger, IPO) and the company is still suffering from the financial crisis of 2008. Therefore it should be considered if the setting in which this case study has been performed was not too hectic and therefore makes it difficult to measure the actual influence from the strategy change.

Future research might benefit from multiple case studies, as a replication of the research within different organizations, even in different industries, improves the generalizability of the findings and rules out the bias from internal strategic decisions. In addition future research could focus on the economical impacts that are a result of changing strategy and the alignment strategy that has to be followed in order to design an appropriate organization structure and MIS. Following a pre-defined implementation process most likely will incur less costs involved compared to a more emergent way of implementing change into an organization. The way how this financial impact influences decision making might shed some light on how companies re-structure their organization as a result of change in strategy. Finally it has to be considered to study the interplay between organizational architecture and MIS only. The dynamics between this interplay mainly is shown between these two elements, as the influence from strategy is mainly the initiator of the interplay between organizational architecture and MIS. When performing such a study, influence from behavior of people and the culture in which this process is happening can give more insights on how this process is being shaped throughout the implementation phase.

## 5.4    Managerial implications

In addition to the recommendation towards company's management this case study shows that managers who face strategic challenges and are forced to change their strategy as a result of the external environmental conditions need to be aware that these decisions have significant impacts for their organization. Altering the organizational architecture and the design of the MIS will lead to a change process that will not always be supported by the people that are working in this organization. Before implementing such change, companies should consider to predict the effects of the strategic change. With respect to the organizational architecture, management

needs to be aware that following a certain strategy will have better fit with a certain configuration. Not only the impacts at corporate level have to be addressed, but also the impact of strategy on structures within a business unit level will have to be addressed.

Regarding the change in MIS as a result of strategic change, it is recommended that the strategic objectives set by management have a certain level of maturity and are embedded within the organization. It can be concluded that after strategic change and altering the structures and systems within an organization, the new designs of these elements are in an 'unstable' condition and are likely to be altered throughout the implementation of these structures and systems. A proper assessment of the intended goals within the organization therefore needs a lot of attention once management decides to alter their strategy.

# REFERENCES

Abernethy, M. A., & Bouwens, J. (2005). Determinants of accounting innovation implementation. *Abacus, 41*(3), 217-240.

Abernethy, M. A., & Brownell, P. (1999). The role of budgets in organizations facing strategic change: An exploratory study. *Accounting, Organizations and Society, 24*(3), 189-204.

Abernethy, M. A., & Guthrie, C. H. (1994). An empirical assessment of the 'fit'between strategy and management information system design. *Accounting & Finance, 34*(2), 49-66.

Anderson, S. W., & Young, S. M. (1999). The impact of contextual and process factors on the evaluation of activity-based costing systems. *Accounting, Organizations and Society, 24*(7), 525-559.

Argyris, C. (1977). Organizational learning and management information systems. *Accounting, Organizations and Society, 2*(2), 113-123.

Armenakis, A. A., & Bedeian, A. G. (1999). Organizational change: A review of theory and research in the 1990s. *Journal of Management, 25*(3), 293-315.

Atrill and McLaney (2009), "Management accounting for decision makers", Pearson Education Limited.

Baines, A., & Langfield-Smith, K. (2003). Antecedents to management accounting change: A structural equation approach. *Accounting, Organizations and Society, 28*(7-8), 675-698.

Baird, K., Harrison, G., & Reeve, R. (2007). *Success of activity management practices: The influence of organizational and cultural factors* Blackwell Publishing Asia.

Barnett, W. P., & Carroll, G. R. (1995). Modeling internal organizational change. *Annual Review of Sociology, 21*, pp. 217-236.

Benders, J., Batenburg, R., & van der Blonk, H. (2006). Sticking to standards; technical and other isomorphic pressures in deploying ERP-systems. *Information & Management, 43*(2), 194-203.

Bennis, W. G., & O'Toole, J. (2005). How business schools lost their way. *Harvard Business Review, 83*(5), 96-104.

Bromwich, M. (1990). The case for strategic management accounting - the role of accounting information for strategy in competitive markets. *Accounting Organizations and Society, 15*(1-2), 27-46.

Chenhall, R. H. (2003). Management control systems design within its organizational context: Findings from contingency-based research and directions for the future. *Accounting, Organizations and Society, 28*(2-3), 127-168.

Chenhall, R. H., & Euske, K. J. (2007). The role of management control systems in planned organizational change: An analysis of two organizations. *Accounting, Organizations and Society, 32*(7-8), 601-637.

Chenhall, R., & Langfield-Smith, K. (1998). Factors influencing the role of management accounting in the development of performance measures within organizational change programs. *Management Accounting Research, 9*(4), 361-386.

Collis and Hussey (2009), "Business Research, A practical guide for undergraduate & postgraduate students", Palgrave MacMillan.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *The Academy of Management Journal, 34*(3), pp. 555-590.

Davenport, T. H. (1998). Putting the enterprise into the enterprise system. *Harvard Business Review, 76*(4), 121-131.

Dechow, N., & Mouritsen, J. (2005). Enterprise resource planning systems, management control and the quest for integration. *Accounting, Organizations and Society, 30*(7-8), 691-733.

Dent, J. F. (1990). Strategy, organization and control: Some possibilities for accounting research. *Accounting, Organizations and Society, 15*(1-2), 3-25.

Dul, J. J. (2010). Necessary condition hypotheses in operations management. *International Journal of Operations & Production Management, 30*(11), 1170-1190.

Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review, 14*(4), pp. 532-550.

G. Sutton, S. (2006). Enterprise systems and the re-shaping of accounting systems: A call for research. *International Journal of Accounting Information Systems, 7*(1), 1-6.

Gerdin, J., & Greve, J. (2004). Forms of contingency fit in management accounting research - A critical review. *Accounting, Organizations and Society, 29*(3-4), 303-326.

Gordon, L. A., & Miller, D. (1976). A contingency framework for the design of accounting information systems. *Accounting, Organizations and Society, 1*(1), 59-69.

Gosselin, M. (1997). The effect of strategy and organizational structure on the adoption and implementation of activity-based costing. *Accounting Organizations and Society, 22*(2), 105-122.

Govindarajan, V., & Fisher, J. (1990). Strategy, control systems, and resource sharing: Effects on business-unit performance. *The Academy of Management Journal, 33*(2), pp. 259-285.

Granlund, M., & Malmi, T. (2002). Moderate impact of ERPS on management accounting: A lag or permanent outcome? *Management Accounting Research, 13*(3), 299-321.

Gurd, B., & Thorne, H. (2003). The transformation of an accounting system during organisational change: A longitudinal study. *Financial Accountability & Management, 19*(1), 21-43.

Henri, J. (2006). Management control systems and strategy: A resource-based perspective. *Accounting Organizations and Society, 31*(6), 529-558.

Hong, K., & Kim, Y. (2002). The critical success factors for ERP implementation: An organizational fit perspective. *Information & Management, 40*(1), 25-40.

Hopwood, A. G. (1987). The archeology of accounting systems. *Accounting, Organizations and Society, 12*(3), 207-234.

Innes, J., & Mitchell, F. (1990). The process of change in management accounting: Some field study evidence. *Management Accounting Research, 1*(1), 3-19.

Ittner, C. D., & Larcker, D. F. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting and Economics, 32*(1-3), 349-410.

Jermias, J., & Gani, L. (2004). Integrating business strategy, organizational configurations and management accounting systems with business unit effectivess: A fitness landscape approach. *Management Accounting Research, 15*(2), 179-200.

Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly, 24*(4, Qualitative Methodology), pp. 602-611.

Kald, M., Nilsson, F., & Rapp, B. (2000). On strategy and management control: The importance of classifying the strategy of the business. *British Journal of Management, 11*(3), 197-212.

Kalling, T. (2003). ERP systems and the strategic management processes that lead to competitive advantage. *Information Resources Management Journal, 16*(4), 46-67.

Kloot, L. (1997). Organizational learning and management control systems: Responding to environmental change. *Management Accounting Research, 8*(1), 47-73.

Kober, R., Ng, J., & Paul, B. J. (2007). The interrelationship between management control mechanisms and strategy. *Management Accounting Research, 18*(4), 425-452.

Kolehmainen, K. (2010). Dynamic strategic performance measurement systems: Balancing empowerment and alignment. *Long Range Planning, 43*(4), 527-554.

Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting, Organizations and Society, 22*(2), 207-232.

Lee, J. C., & Myers, M. D. (2004). Dominant actors, political agendas, and strategic shifts over time: A critical ethnography of an enterprise systems implementation. *The Journal of Strategic Information Systems, 13*(4), 355-374.

Lincoln Y.S. and Guba E.G. (1985), "Naturalistic inquiry", Sage Publishing, Thousand Oaks.

Marginson, D. E. W. (2002). Management control systems and their effects on strategy formation at middle-management levels: Evidence from a U.K. organization. *Strategic Management Journal, 23*(11), 1019-1031.

Merchant, K. A., & Van der Stede, W. A. (2006). Field-based research in accounting: Accomplishments and prospects. *Behavioral Research in Accounting, 18*, 117.

Merchant, K. A., & Van der Stede, W.A. (2003), "Management Control Systems", Prentice Hall.

Miller, D. (1986). Configurations of strategy and structure: Towards a synthesis. *Strategic Management Journal, 7*(3), 233-249.

Mintzberg, H. H. (1985). Of strategies, deliberate and emergent. *Strategic Management Journal, 6*(3), 257-272.

Modell, S. (2010). Bridging the paradigm divide in management accounting research: The role of mixed methods approaches. *Management Accounting Research, 21*(2), 124.

Morton, N. A., & Hu, Q. (2008). Implications of the fit between organizational structure and ERP: A structural contingency theory perspective. *International Journal of Information Management,28*(5), 391-402.

Naranjo-Gil, D., & Hartmann, F. (2007). Management accounting systems, top management team heterogeneity and strategic change. *Accounting, Organizations and Society, 32*(7-8), 735-756.

Nilsson, F. (1999). Implementing business unit strategies: The role of management control systems. *Scandinavian Journal of Management, 15*(1), 65.

Otley, D. (1999). Performance management: A framework for management control systems research. *Management Accounting Research, 10*(4), 363-382.

Porter M.E. (1985), "Competitive Advantage, Creating and sustaining superior performance", Simon & Schuster Ltd

Quattrone, P., & Hopper, T. (2001). What does organizational change mean? speculations on a taken for granted category. *Management Accounting Research, 12*(4), 403-435.

Quattrone, P., & Hopper, T. (2006). What is IT?. SAP, accounting, and visibility in a multinational organisation. *Information and Organization, 16*(3), 212-250.

Roberts, J., & Scapens, R. (1985). Accounting systems and systems of accountability — understanding accounting practices in their organisational contexts. *Accounting, Organizations and Society, 10*(4), 443-456.

Scapens, R. W. (1990). Researching management accounting practice: The role of case study methods. *The British Accounting Review, 22*(3), 259-281.

Scapens, R. W., & Jazayeri, M. (2003). ERP systems and management accounting change: Opportunities or impacts? A research note. *European Accounting Review, 12*(1), 201-233.

Scapens, R. W., & Roberts, J. (1993). Accounting and control: A case study of resistance to accounting change. *Management Accounting Research, 4*(1), 1-32.

Simons, R. (1987). Accounting control systems and business strategy: An empirical analysis. *Accounting, Organizations and Society, 12*(4), 357-374.

Skaerbaek, P., & Tryggestad, K. (2010). The role of accounting devices in performing corporate strategy. *Accounting Organizations and Society, 35*(1), 108-124.

Slagmulder, R. (1997). Using management control systems to achieve alignment between strategic investment decisions and strategy. *Management Accounting Research, 8*(1), 103-139.

Swan, J., Newell, S., & Robertson, M. (1999). *The illusion of 'best practice' in information systems for operations management.* Palgrave Macmillan.

Vassiliadis, S (2005). *Presentations and Internal Reports on Strategy Dockwise Shipping*, Stern Stewart & Co.

Velcu, O. (2010). Strategic alignment of ERP implementation stages: An empirical investigation. *Information & Management, 47*(3), 158-166.

Verbeeten, F. H. M. (2010). The impact of business unit strategy, structure and technical innovativeness on change in management accounting and control systems at the business unit level: An empirical analysis. *International Journal of Management*, *27* (1), 123-143.

Voss, C., Tsikriktsis, N, and Frohlich, M. (2002), "Case research in operation management", *International Journal of Operations&Production Management*, *22*(2), 195-219.

Vries, R. de (2009), "Audit Results SAP Implementation for Dockwise Shipping B.V", *Report Mybrand.*

Yin, R. (2003), "Application of case study research", Thousand Oaks California, Sage

Zimmerman J.L. (1995), "Accounting for decision making and control", McGraw-Hill

## APPENDIX A: STUDIED DOCUMENTS

| Type of Data | What is included | Purpose | When gathered |
|---|---|---|---|
| Internal Documents | Progress reports, consultancy recommendations, minutes of meetings, implementation presentations | To provide a general overview on the implementation processes, durations and key decisions. | Feb - May 2011 |
| Theme interviews/higher management | Theme interviews with executives representing key corporate functions. All of the interviewees also had prior business experience. | Obtain insight on the envisaged strategy, organizational architecture and MIS and the implementation strategy | April 2011 |
| Theme interviews/ middle and lower management/implementation partner | Theme interviews with business-level managers representing major business areas and horizontal organizations (projects). | Obtain insight of the perception of the envisaged strategy, organizational architecture and MIS and the implementation strategy. | April/May 2011 |
| Public Documents | Annual reports, investor/analyst presentations, press releases | To provide complementary data about company's business environment, corporate and business strategy approach and the use of organizational architecture and MIS. | Feb - May 2011 |
| Informal discussions | Informal discussions with key informants, such as project managers, controllers, administrators and project supporting staff. | Get more detailed information on perceptions of employees regarding strategy, organizational structures and MIS and their opinion regarding the chosen implementation strategy. | Feb - May 2011 |

# APPENDIX B: LIST OF INTERVIEWEES AND PROTOCOL

**Interviewees:**

Chief Executive Officer, Chief Financial Officer, Project Managers, Manager Finance and Control, Vice President Operations, Vice President Offshore Sales, Director HMT, Consultant SAP Implementation.

**Protocol Interview:**

<u>Strategy</u>

1. Could you explain the strategic decisions that have been made and to what extend these strategic objectives have been implemented (from 2006 onwards (sell of DW by Heerema)?
    a. How did the external environment influence the strategy?
    b. Did the sale of the company by Heerema influence these decisions?
2. Are you able to label the type of strategy Dockwise is following? (Prospector – defender, cost leader – differentiation, etc.)
    a. In the document of Stern Steward &Co. the theories of Porter are mentioned, was this deliberate? If so, which type of strategy was envisaged?
    b. Is there a difference between the existing 'core business (HMT)' and the new strategic objectives?
    c. To what extend is the strategy actually implemented?
    d. Is the new mission (becoming a billion dollar company) a logical step?

<u>Organization</u>

3. Was management aware that the organization maybe had to change during the time the strategy was changed?
    a. Which changes have been foreseen?
    b. Is there need for another organization in order to realize the strategic objectives?
    c. Do the organization structures have to change?
    d. What surprised you the most during the change of the organization?
    e. Could this have been prevented?
4. Organizations do not only exist of people, it also exists of structures and systems. Which changes have been initiated in order to meet the strategic objectives?
    a. Did management foresee this?
    b. To what extend did the company looked at their competitors?

c. Does the new market influence this?

d. How did external events like the IPO, cross listing, investments, acquisitions, ect influence this?

Management Information Systems

5. Did MIS play a role during the implementation of the strategy?
   a. Was management aware that the MIS might had to change?
   b. How important is management information during the implementation of a new strategy?
   c. Is this information the same for all people involved or is there need for different steering information?
   d. Did the management information change compared to the management information before that change of strategy?

Alignment

6. Alignment of strategy, organizational architecture and MIS
   a. Has this had sufficient attention during the strategy implementation or is this still going on?
   b. How is this supported?
   c. To what extend does the attitude and behavior of employees influence this?
7. Do you think that ERP systems like SAP need to have a certain fit with our company? Or is this not relevant at all?
   a. How can an ERP system support our business?
   b. Is it essential for our strategic objectives?
   c. If so, do we need to altwer our processes in order to fit the system or vice versa?

## APPENDIX C: OVERVIEW QUOTES

Quotes shown in tables are made anonymous. Transcripts of the interviews can be showed upon request.

## Strategy - Reason change

| Interviewee | Quote |
|---|---|
| A | *"[...] but I do know the strategy: 3 business models: HMT, T&I and LM. This approach was chosen because the company foresaw more competition in the HMT segment. Therefore we needed to distinguish ourselves in order to keep the price premium we always used to have within the HMT business line. In addition we needed to innovate: offer clients more turnkey solutions (T&I and LM)."* |
| A | *"Especially from our competitors: they have the benefits of low cost regions (Chinese) that is the main reason why we are changing strategy, otherwise we kept on doing what we were good at."* |
| A | *"There is a big difference in keeping a certain position within a known market, compared to positioning yourself in a new market segment in which you are not that familiar. It needs another way of doing business. Entrance in a new market needs investments: knowledge, experienced people, assets etc. For the existing strategy you would rather not invest too much in order to maintain cost leadership or at least keep the costs as low as practically possible."* |
| D | *"[...] as a result of increasing competition the differentiation became more and more necessary. Also the aging of the fleet and the limited amount of vessels caused a change in the earnings model."* |
| C | *"We actually started changing our strategy in 2004. The session with CG was the basis for our change in strategy. Next to HMT we wanted to perform T&I and Door to door. "* |
| C | *"[...] but from a corporate point of view we need to think how we can combine these 3 different business lines in order to achieve a as sustainable as possible business model. The disadvantage of HMT is that it follows a very cyclical trend. [...] what we do experience is: a couple of years of increasing revenues and all of a sudden a fall back in revenue. [...]. What we try to achieve is to get a sustainable business model, at least try to flatten out the jigsaw trend line. We can accomplish this by investing in markets that are not in-line (a-symmetric) with each other."* |
| I | *"Strategy is initiated by external factors. By participating in projects as subcontractor for Aker and Technip we found out that we were the one who had the strategic assets. We only needed to add proper engineering and other relevant disciplines."* |
| J | *"We encountered the following situation we owned a fleet of vessels and in addition* |

| | |
|---|---|
| | *we managed some other vessels as well. In those days our revenue model existed from an x amount of vessels times an x amount of day rates, which lead to a given maximum of revenue within the HMT that followed a given cycle."* |
| J | *"For Heerema the company was a cash cow that generated plenty cash, but we foresaw that the vessels were getting older and we needed to reinvest in our fleet in order to keep up the business. As mentioned earlier the revenue was capped, so we needed to think of something else."* |
| E | *"Strategy: 3 legs strategy: HMT, Extend T&I, develop Logistical Management"* |
| F | *"Most important one is that the T&I should be developed more. More scope, more revenue, less dependent on HMT."* |
| F | *"[…]. The market situation forces us to be more cost aware and is driving us o the higher segment where there is less competition and where the entrance is difficult."* |

## Strategy - Type of strategy

Interviewee    Quote

| | |
|---|---|
| A | *"We follow in case something is changing in de market, we do not initiate something by ourselves."* |
| D | *"Within HMT we try to focus on fleet occupation and volume in revenue, T&I is more prestige and getting ourselves noted within the installation market which should lead to the 'billion-dollar company'. HMT has more flexibility and is more spot market related versus the T&I where you are depending on installation seasons and have a better oversight regarding the schedules  - long term contracts."* |
| C | *"[…] because we developed activities which gave us an advantage compared to our competitors that made it difficult for them to follow. We have a competitive advantage as market leader in a niche environment. But we also established that we saw a lot of competitors would enter the market (China Norway). So what we did was based on this fact and not on the existing market. We wanted to position ourselves even better by adding another niche activity: T&I and LM"* |
| B | *"Strategy is to position Dockwise at the high end of HMT and T&I business. This means that there are some aspects within these markets that dictate how we should organize the company."* |
| B | *"I think that is still not clear yet. In fact Dockwise is looking for a differentiation strategy, because to show that they can do something different or something special. Dockwise also strives for cost leadership, but it has to be noticed that quality and flexibility are very important, which even may result in higher costs."* |
| I | *"I think a differentiation strategy. We definitely are not cost leader, we forgot about this because we were a monopolist last few years. Spread the portfolio, so you are less depending on the HMT business."* |
| J | *"It was an inside out strategy instead of outside in…..some of the existing clients were not that fund about the fact that DW started in the T&I segment, because in meant more competition for them. Their clients embraced the fact that we changed our strategy, for* |

| | |
|---|---|
| | *them it meant more contractors in the market from which they could choose and thus more negotiation possibilities."* |
| J | *"Difficult to say…….if you look at the current situation a mix: Cost leadership in HMT, differentiation in the T&I and LM segments. I believe that we should separate these activities."* |
| E | *"The core of our strategy is to create an as much versatile fleet as possible. Vessels that can be used in HMT – T&I - LM. So: differentiation."* |
| E | *"Within these three segments there is a kind of different strategy, corporate strategy is not cost leader. We want to add value for our clients by executing premium contracts. So in general you can say that we follow a differentiation and prospector strategy."* |
| F | *"Be market leader, not cost driven. Try to differentiate. Two streams, the high end of the market and be different in service versus plain HMT. Questionable is if this fits in one company."* |

## Strategy - Reason change

Interviewee    Quote

| | |
|---|---|
| A | *"[...] but I do know the strategy: 3 business models: HMT, T&I and LM. This approach was chosen because the company foresaw more competition in the HMT segment. Therefore we needed to distinguish ourselves in order to keep the price premium we always used to have within the HMT business line. In addition we needed to innovate: offer clients more turnkey solutions (T&I and LM)."* |
| A | *"Especially from our competitors: they have the benefits of low cost regions (Chinese) that is the main reason why we are changing strategy, otherwise we kept on doing what we were good at."* |
| A | *"There is a big difference in keeping a certain position within a known market, compared to positioning yourself in a new market segment in which you are not that familiar. It needs another way of doing business. Entrance in a new market needs investments: knowledge, experienced people, assets etc. For the existing strategy you would rather not invest too much in order to maintain cost leadership or at least keep the costs as low as practically possible."* |
| D | *"[...] as a result of increasing competition the differentiation became more and more necessary. Also the aging of the fleet and the limited amount of vessels caused a change in the earnings model."* |
| C | *"We actually started changing our strategy in 2004. The session with CG was the basis for our change in strategy. Next to HMT we wanted to perform T&I and Door to door. "* |
| C | *"[...] but from a corporate point of view we need to think how we can combine these 3 different business lines in order to achieve a as sustainable as possible business model. The disadvantage of HMT is that it follows a very cyclical trend.  [...] what* |

| | |
|---|---|
| | *we do experience is: a couple of years of increasing revenues and all of a sudden a fall back in revenue. [...]. What we try to achieve is to get a sustainable business model, at least try to flatten out the jigsaw trend line. We can accomplish this by investing in markets that are not in-line (a-symmetric) with each other."* |
| I | *"Strategy is initiated by external factors. By participating in projects as subcontractor for Aker and Technip we found out that we were the one who had the strategic assets. We only needed to add proper engineering and other relevant disciplines."* |
| J | *"We encountered the following situation we owned a fleet of vessels and in addition we managed some other vessels as well. In those days our revenue model existed from an x amount of vessels times an x amount of day rates, which lead to a given maximum of revenue within the HMT that followed a given cycle."* |
| J | *"For Heerema the company was a cash cow that generated plenty cash, but we foresaw that the vessels were getting older and we needed to reinvest in our fleet in order to keep up the business. As mentioned earlier the revenue was capped, so we needed to think of something else."* |
| E | *"Strategy: 3 legs strategy: HMT, Extend T&I, develop Logistical Management"* |
| F | *"Most important one is that the T&I should be developed more. More scope, more revenue, less dependent on HMT."* |
| F | *"[...]. The market situation forces us to be more cost aware and is driving us o the higher segment where there is less competition and where the entrance is difficult."* |

## Strategy - Implementation

| Interviewee | Quote |
|---|---|
| B | *"For HMT we are market leader, we can expand, but only with new cargos. The mid segment and high end is defending. Regarding T&I you are talking about investing and act more offensive, looking at new combinations and taking more commercial risk when doing this."* |
| I | *"[...] we made a lot of effort in explaining and promoting the strategy, but apparently not everybody is aware of it or knows what it exactly comprehends. Maybe people use it as an excuse, so they can continue with what they were doing and refuse to change."* |
| J | *"We had everything on paper and explained to the market, but our focus was at the selling of the company. This took a lot of the attention and resources away from the strategy implementation. There were too many external factors that took away the momentum from the strategy implementation."* |
| E | *"I think this is an ongoing process. Last year we defined what market leader actually means and we concluded that we wanted to be the front runner in the top-* |

| | |
|---|---|
| | *segment of the market. This has been one of the main reasons to build type 0 and by this we want to defend our leading position."* |
| E | *"Regarding T&I we saw that we executed some projects, but we need to get more scope in this segment of the business. At the moment we offer a small part of a T&I contract. Preferably we want to offer the complete package, so we can position us better in this segment."* |
| F | *"Organization is not aligned yet. Strategy is clear and mindset is there, but the actual alignment is not there."* |

## Strategy - Fit

| Interviewee | Quote |
|---|---|
| B | *"I think we are lagging behind a bit. One of the reasons is that it is not acknowledged that we need to follow different strategies within this company. An example given is that I believe that we have a too large project management approach for HMT (this should be lean and mean), but for T&I and LM we are actually not matured enough as a project management company."* |
| I | *"[...] so to some extend we really are changing our scope – especially in the T&I – and the company is learning a lot. I guess you can say that the strategy is paying off for this part of our business."* |
| J | *"Looking at a corporate level we follow a certain strategy. But this strategy consists of several components: T&I is another business than HMT. HMT, even with a large cargo, has duration of about 60-70 days and T&I you are facing durations of 2 to 3 years. LM is even longer, it is a totally different world. "* |
| E | *"These are two strategy characteristics that belong to the existing portfolio, if you look at the new segments it is more like a market entry by growth of the additional services next to the existing one. (scope creep towards former clients). It is difficult to label the strategy for the new segments."* |
| E | *"[...] because it is a tight market and there is a high need for revenue, so the focus lies on the short term. This makes it difficult to make investments for the long term. For the investments itself it is also difficult, as the result of today are not that promising. So that is a valid risk and additionally; if we see these busy times for 2012, 2013 and 2014, how do we keep focus on the growth, development and strategy? We will be busy enough with the day to day business itself...."* |
| F | *There are actually two main strategies: the first one is to hold on to the position of market leader in the HMT and the second one is to become a preferred marine contractor for T&I and LM. [...] For HMT do what they do best: short cyclical and efficient way of working for HMT, lean and mean, standardized processes. At the project side: longer turnarounds, larger scope and therefore you need other people, other competences, and another approach in fact* |

## Organizational Architecture – Reason Change

| Interviewee | Quote |
|---|---|
| A | *"I believe that any change in strategy leads to change in organization. I only saw some changes in the PM department, but what I do notice more are the changes that do not occur. This is partly causing a stuck in the middle effect. I believe that these changes could have been done more rigorously."* |
| A | *"In my opinion HMT is typical line management and standardized business, projects are never the same and that is why you need a project management orientated organization."* |
| D | *"[...] the liabilities we have within our contracts are much higher than in the HMT. Clients expect more management in the T&I contracts than in the HMT contracts."* |
| C | *"In addition we already we identified that the existing organization was not up to speed with the envisaged strategy. Together with S&S we looked at the sales process (tendering) and the execution of such large projects and came to the conclusion that we needed to hire people with other competences that we had available."* |
| C | *"Dockwise was a separate division within the Heerema group, with its own management and structures and board. We had regular talks with the Heerema holding, but this was merely for the annual figures (consolidation), we formulated our own strategy and way to perform our business."* |
| C | *"Directly after the decision was made to change the strategy we decided that we needed more disciplines in house in order to make it work. [...]. So we looked for experienced Project managers, we organized our risk management; we hired project engineers in order to cope with the differentiation in engineering capabilities. Procurement has changed. We split sales into HMT and projects, the tendering disciplines needed to be occupied."* |
| I | *"[...] we had a fairly small organization based on our core business. Position like control did not exist. At least not per project, we had a corporate controller. When we started formulating our strategy we knew that we could keep the existing line organization for HMT purposes, but that we needed to introduce a project management organization for the T&I and LM. "* |
| I | *"We claimed to have a project organization, but as soon as you needed resources for your project you were the last one in line at the department manager's desk. But we did foresee that we needed another organization structure in order to meet the strategic objectives. "* |
| J | *"We needed to manage a complete project, not just a small part of it. That is way we could not manage this with the existing functional organization."* |
| E | *"The IPO has been underestimated by management in sense of the fact that it needs a huge effort from an organization to get this realized. In addition you are faced* |

| | |
|---|---|
| | *with governance, compliance, reporting obligations, etc. If this company had been a private company for another 4 years, it would have been much easier [...]"* |
| F | *" [...] it was more related to the fact that an IPO was foreseen, so the (financial) organization needed to be restructured in order to facilitate this. The company needed faster MIS, growth, more selling offices. But it was not conceptualized, it was more a given fact and because a lot was going on, the objectives were not really made clear. Instead of that we started off with a solid foundation, we already where thinking of putting the roof onto the building."* |
| F | *"We need more selling offices in order to get larger projects. There is the need for a supporting office to the projects, so the specialized people can focus on what they are good at. I think project need more specialized people than the regular business we were used to."* |

## Organizational Architecture – Implementation

| Interviewee | Quote |
|---|---|
| A | *"NAVI project is a good example of this, intention is good, but as soon as the business requires more resources, all people working on the NAVI project are taken off again."* |
| D | *"[...] In addition it was underestimated how many new competences had to be hire as well and then I mean project managers, buyers, operational personnel, planners and so on. The main idea amongst the company was that we were able to increase the responsibilities and tasks of the existing employees and that with minimal effort the new business lines could be developed. "* |
| D | *"Another effect is that due to the fast expansion of our company it is not always very clear if we actually need all the new departments and it is questionable if they are structured in a correct manner. It shows within all the discussions we have: almost no decision making which makes our company slow in responding on changes in the market or organization."* |
| D | *"We differentiated our sales process in HMT and offshore installation; this is an important step that has been taken."* |
| C | *"We looked at the matrix model. How many do you need on projects, can they do multiple projects? And how do we hire these people: all at once or gradually, we choose the last option. Once this was covered, we needed to see how these people dealt with projects. How many could they perform at the same time? "* |
| B | *"[...] if the strategy has been established, than you should consider how you should design your organization in order to meet the strategic goals. Within Dockwise they should have been focused more in how to set-up a project organization instead of running your project using a more departmental orientated company."* |

| | |
|---|---|
| B | *"[...] If this is not addresses correctly, people will get confused on who is responsible for what or information will end up at the wrong places and therefore the activities and up at the wrong place as well. This makes it all very difficult to support the strategy. In other words: in case you do not plan the change in organizational structures to support the strategy, the organization eventually will follow. This however, will cost much more time and effort."* |
| B | *"Alignment of several existing systems that are been used, so the role of the systems within the existing processes. By doing this you will gain more insight on how everything is related to each other and this will help to align the system to the strategy that is envisaged."* |
| B | *"In case of Dockwise it was decided that some particular parts of the systems were that specific (EMS, Fleet schedule), so we did not make an effort to try to fit this into the ERPS. [...]. Therefore it was decided to use as much as these standard components as possible, this was not only our philosophy, but also the vision of Dockwise' management."* |
| I | *"Positively was the fact that we developed a lot of initiatives, but that was our pitfall as well, we had so many ideas that we lost overview and focus, which lead to no priorities. If we had made a decent planning maybe things would have been different. Probably we skipped some stages, but we were in a hurry as well. When you look back it might had been better to take more time for this, but that is easily said. At the other hand, once you have the momentum, why stop??"* |
| J | *"[...] it surprises me that project management still is not a mature discipline within this organization and it is lacking the status that it should actually have. I believe that this is caused by the fact that the principles of PM are still unknown to a large part of the company. "* |
| J | *"[...] this was not the case and therefore it was decided to design blueprints for the system. However, these were very much based on the HMT business model. This was the result of the fact that we did not had the knowledge on project management, neither did our implementation partner. "* |
| J | *"Because of the growth of the company we did not had enough time to teach new employees our systems and processes, which lead to reinventing processes all over again by these new people."* |
| E | *"Back in those days 70 people were working at HQ and obviously this was not sufficient to expand the business that was foreseen. Therefore the office in Houston has grown and a new office is being set-up in Shanghai. The integration between these 3 offices and the implementation is not finished yet, again due to other priorities."* |
| E | *"The passion of all involved does not necessarily mean that they all want the same. Everybody is in it for the best of the company; no people try to frustrate the process. However, when everybody is pulling in a different direction, it will be a huge effort* |

| | |
|---|---|
| | *for everybody, but actually little progress is being made. "* |
| E | *"Organization structure has been changed, more foreign offices, Project management organization, Project Suppport Office. Reimplementation of SAP, introduction of NAVI, appointing process owners. We are not there yet, but there is a systematic way of thinking these days on how we need to change the organization in order to match the strategic objectives. Structure follows strategy...."* |

## Organizational Architecture - Fit

| Interviewee | Quote |
|---|---|
| A | *"[...] Example is the matrix organization: no line, no project management. In the end we are trying to execute project by using a line organization. The matrix organization is in fact the basis of the stuck in the middle effect."* |
| D | *"Within HMT we had a fairly standardized way of working, but with the new T&I contracts we have to start all over again in getting our business procedures and processes up to a certain level of standardization."* |
| E | *"[...] For the other ones I believe that you will have to cooperate where it makes sense (P&S, AE). Do things differently where this is necessary."* |
| F | *"If a company chooses to follow to business lines, a company needs to look at where supporting disciplines are overlapping and try to combine this as much as possible. For each business line you need an administration department, after calculation, engineering. [...]. In addition you need to allocate the costs accordingly and not overload for example the HMT resulting in too high prices in comparison with your competitors. But in the end you need two different organizations and make the right persons responsible and accountable in such a way that there are no overlaps or gaps, because that will lead to confusion. [...]."* |

## Management Information System – Reason Change

| Interviewee | Quote |
|---|---|
| A | *"The escalation model should be a part of the reporting. As a Project manager you have more detailed figures than somebody in higher management (he would be more interested in the forecast of the projects). It is just the way how the figures are presented."* |
| D | *"It seems that the focus on reporting has shifted a financial perspective only, instead of providing management steering information as well. [...] Therefore I need other information than what the shareholders want to see. It should be noted that as a Project manager you are heavily involved in your project, so you more or less know what to expect regarding money spend on the project. It should not be a surprise once the reports are generated from the system."* |
| D | *"They should need information in order to steer their strategic objectives. I need information in order to monitor my budgeted costs."* |
| C | *"The analytical information in order to judge how projects are running and to measure what is going on is of vital importance. In the end a new strategy has been developed, a new organization has been set up, [...]. So especially in the first years you want to measure what is going well and what is not? It is well possible that a project is technically outstanding, but is that than also the case financially?"* |
| B | *"[...] downside is that you get a disconnection in what is happening in the system and at the other side what is happening in the changing organization. There are situations created where you can see that the information within the system is tuned to the old way of doing business. This will cause that this information is not usable anymore to manage the newly developed T&I segment, because the data is changed into information that was needed to manage HMT and not T&I."* |
| B | *" [...] you need to check if your strategy is successful and to monitor if the methods you are using in order to implement the strategy are effective. Therefore you will need to know what the characteristics and criteria of the strategy are, so you can define KPIs within several processes in order to measure if this is actually the case. In DW case these KPIs are defined too late, only when somebody wants to know what actually is going on, so not before the implementation has started"* |
| B | *"If the information is not clearly defined before the reports are designed, you might face the risk that this information can be interpreted differently by different managers.  So the truth is not the same among several managers."* |
| B | *"Long lead projects need other MIS than the former line business. Lead times are longer, involved money is larger. To manage this is more important for the stability of the company, if you do not manage this, the risk will increase."* |
| I | *"Now we need other reporting because our expenses at the projects are totally different than at HMT. We used to report hours for scheduling reasons, not for cost* |

| | |
|---|---|
| | *allocation."* |
| E | *" [...] a manager that is running the project needs other information than the manager that is looking if the projects in general are profitable. In the end it is all a matter of aggregation. This drill down should be valid and consistent, otherwise it will not work. It should be the same information but than in more or less detail. What we need to be aware of is that these levels need to show one truth. Because, if figures can lead to a different interpretation by managers, it can be very dangerous for our company."* |
| E | *"It used to be more of family business, the CEO had a small talk with the owner and that was enough. This is not the way you can manage a listed company. This is also documented in our corporate governance a compliance reports. All is cascaded down and there is a manual of authorities, this was not the case a couple of years ago"* |
| F | *"IPO: mainly for finance and the way of reporting (especially the short time in which this information is needed). Investors and shareholders are keener on the information that is provided, especially when it is bad news...."* |
| F | *"MIS has to be improved, in particular align the system on how we want to operate and trying to close the gap between the corporate reporting and operation reporting. Along this exercise the cost allocation will have to be improved as well."* |

## Management Information System – Implementation

Interviewee   Quote

| | |
|---|---|
| A | *"No we started off like a chicken with its head off. We did not look at the way we were organized and how our processes were identified. I guess this could have been better introduced and also could provide us with the essential information in order to position ourselves."* |
| D | *"We did foresee that we had to approach T&I contracts differently than the HMT contracts. [...] Instead of getting the more detailed and complex contacts into the system, it was decided to have HMT contracts in the system first. This lead to some difficulties as the T&I contracts need much more information than HMT, so the system was mainly designed to manage vessel days and not other cost components. [...]."* |
| C | *"We introduced SAP in order to manage the larger projects. We realized that we had to implement SAP – or another ERPS – in order to facilitate the new business. The mistake we made is the fact that we thought that we could copy SAP from the former owner (Heerema) – because at that time we were still part of the Heerema company and said to them, give us a copy and we will fix it – but in end that was a major misconception"* |

| | |
|---|---|
| C | *"What we learned from our consultant is that you need to keep SAP as much intact as possible and accept the items which are not covered in the system. With our first implementation partner we tried to do it the other way around, we tried to manipulate the software in order to make SAP do what we were used to within the company. That was a big misinterpretation. Our second partner told us to keep SAP as it is and try to adapt the processes within the organization to the capabilities of SAP."* |
| B | *"This is what we discovered two years ago: does the ERPS not work or are our organization and processes not up to speed yet and does this result in the fact that we do not know how the ERPS can support our business?"* |
| B | *"[...] are the processes: Procure to Pay: processes are aligned and implemented. PSO is a department that will support on how the systems will be designed. So NAVI, new departments and Enabling the future. There is progress booked at some levels, but there are also issues that still need a lot of attention in order to get the proper alignment between the strategic objectives and the organization structures and systems."* |
| E | *"Very important you need to make sure that this information is valid as well. You have to make sure that your assumptions are correct. You also need to know what you do not know. Not knowing what you not know is very dangerous, otherwise your strategy is being built on quicksand [...]"* |
| F | *"My perception is that they introduced SAP because DW became a large company and they needed a new system....theory prescribed that in that case you needed an ERPS, so management decided that that was what DW needed as well. Next step was: buy the CD, install the system and of you go ....."* |
| F | *"Maybe it had been better to design your processes in the last four years and then introduce an ERPS, it very well might be that we would have booked more progress with this approach."* |

# Management Information System – Fit

| Interviewee | Quote |
|:---:|:---|
| A | *"At the moment we still use the reporting systems that were good for the shipping business, but this is not good enough to run projects with significantly more amount of scope."* |
| C | *"It is useful information, it is like a thermometer, and it differs from month till month. By talking to the PM you know what is going on and compare it with the data from SAP, it gives confidence that it is running well and within the estimates we made."* |
| B | *"There is a clear difference. Different information is required by different people and different people are composing the reports. There are examples of reports that are using the same wording and definitions, but can be interpreted completely different at several levels."* |
| I | *"It was presented nicely and it was promised that we would have one touch on the button and than we would have all information available…….we are 5 years underway now and I still cannot get the data I want from the system. I am convinced that if we took more time to investigate in the possibilities, it would have been different these days."* |
| E | *" when changing the org you need other data, so you need to tweak your system flexibility in MA is important and that is why it has a lousy fit with SAP. Other way around it is less obvious. You should consider why 60% of all companies are using an ERPS, in that respect it should make sense."* |
| F | *"In my opinion management reporting is more than just only reporting on P&L, management should be informed on much more non-financial numbers as well: numbers of contracts signed, amount of enquiries received, percentage of invoices paid, amount of fte's, etc. At the moment it is improving and the reports are containing more information, but there is still a lot to improve."* |

## Alignment

| Interviewee | Quote |
|---|---|
| A | *"[...] We are adjusting all the structures and systems, with an organization that is still half completed. This has a negative effect that we also design the systems partly and also take care of a part of the MIS. I have the feeling that we need to the strategy needs to be implemented more firmly.....[...]"* |
| A | *"At the beginning of the first introduction I once said that we had to let go of the system itself for a moment. We first needed to redefine our processes; we should be able to perform our work without the ERPS. If we are able to reconfigure our processes, than we should start trying to fit this in with SAP."* |
| D | *"I believe this works both ways. If the system does not work people properly get frustrated, but when people do not provide the proper input in order to feed the system; the system will not work....."* |
| C | *"This can be accomplished using top down or bottom up information flows. We get the information on what is not going well. We need to consider what lies behind this information (how serious, political, lasyness......). [...] Communication is in this case very important. [...]. But you will have to listen to the organization and weigh what is a valid comment. There is a lot of politics involved, but we need to make sure that what serious issues are adhered to. You can lose people that are fed up with the fact that they are not being heard."* |
| C | *"We determined our strategy – and we are evaluating this now a day – we have started up SAP, this can be improved, we choose the organization structure, SAP should support this. The OS can be fine-tuned better so it will enable an even faster growth than we experience today. And eventually the ERPS will change along with it. I am convinced that the company will continue to grow, so we need to reconfigure every time we make such decisions."* |
| B | *"By redefining processes of the departments, people will be confronted with consultant are implementation project members that start interfering with their method of working. When change occurs, the first reaction of people is that they dig their heels in. "* |
| J | *"This has not been done sufficiently. As mentioned earlier: we have two different business lines that need to follow a different strategy, but we have one organization to support this. [...]. We experience in the processes that we cannot manage to have a general process; there is still a lot to do. [...] the intention was to complete our business line T&I, but we did not paid enough attention on how to incorporate these companies in our company. So alignment has not been achieved at all."* |
| E | *"There are two things you can do: spend a lot of money and adjust the system to match your organization or you keep the standard system and you will have to alter your organization a bit. The last one is almost always better. You will need to know* |

| | |
|---|---|
| | *what your competitive edge is and not use the system for that (because that is where you are better than the rest). "* |
| E | *"I think we made some first steps and we know where we want to go, we know where we stand at this moment, but it still will need a lot of effort to get there. Of course in case you had plenty of time in order to prepare yourself for such an implementation project, it would have been another story."* |
| E | *"This has to with the natural resistance against change and the transparency that will be achieved makes people nervous. Apparently there is quit some lack of trust between several disciplines. So if we can achieve the transparency, than we also will deal with the trust issue. But I think that is more a cultural issue than a technical issue."* |
| E | *"[...] of course, that is the whole discussion on making processes more transparent and tries to standardize it. You are creating autonomy by reduce autonomy for others. Standardizing is a nice tool, except for the ones that are being standardized."* |
| F | *"There should be a transparent reporting system that shows all the key performance indicators for each department or project, on which higher management can make their decisions."* |
| F | *"Accounting for corporate and operations is totally different, figures in the end should origin from the same data. We redesigned our GL accounts in 2009 where we decided that no expenditures could be booked on a cost center, only on project numbers."* |