Applying Marchand’s Information Orientation Theory to Sigma Kudos—an Information Product Company

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Abstract
Marchand, Kettinger and Rollins’s (2001) definition of Information Orientation gave us an overall understanding about company’s information management. Different from Market Orientation and Customer Orientation etc., Information Orientation Theory focuses on study of how interaction of people, information and technology affect business performance. It pursues to establish an infrastructure of information technology application capabilities within a business organization to achieve effective information use and business performance improvement. In this study, we are applying Marchand’s Information Orientation Theory to the information technology application system of the Sigma Kudos, an Information Logistics Company by using Case Study methodology. We learnt that Marchand’s Information Orientation theory and its entities can be used perfectly to exam and measure the information management capability of the company. During the study, we find out many interesting aspects which information product companies need to consider about. Among of them, one aspect is the main finding from this study that we integrate resource and vision/strategy to the Information Orientation Theory as they are also the key areas that have an effective impact to a company’s business performance.

Keywords: Information Orientation, Information Management, Information Orientation Management, Information Technology (IT) Application, Market Orientation, Customer Orientation.
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# Contents

Chapter 1. Introduction ........................................................................................................... 1

1.1 Background ..................................................................................................................... 1

1.2 The Company Sigma Kudos .......................................................................................... 2

1.3 Research Objectives and Research Questions ............................................................... 2

1.4 Scope and Limitations ..................................................................................................... 3

1.5 Summary .......................................................................................................................... 3

Chapter 2. Marchand’s Information Orientation Theory .......................................................... 5

2.1 Information Orientation .................................................................................................. 5

2.2 Information Technology Practices .................................................................................. 6

2.3 Information Management Practices ............................................................................... 7

2.4 Key Behaviors and Values Lead to Effective Information Use ....................................... 13

2.5 Information Orientation Culture .................................................................................... 17

Chapter 3. Sigma Kudos Company ......................................................................................... 20

3.1 Company Introduction .................................................................................................... 20

3.2 SPI Analysis Method ....................................................................................................... 21

3.2.1 SPI Inventory ............................................................................................................ 22

3.2.2 SPI Analysis ............................................................................................................. 22

3.2.3 Information Analysis ............................................................................................... 23

3.2.4 Process Analysis ....................................................................................................... 23

3.2.5 System Analysis ........................................................................................................ 24

3.3 DocFactory ..................................................................................................................... 25

3.4 Cooperate Projects that Develop Line of Business ....................................................... 27

Chapter 4. Methodology .......................................................................................................... 28

4.1 Research Method ............................................................................................................ 28

4.2 Data Collection Method ................................................................................................. 30

4.3 Data Collection Process ................................................................................................. 31

4.4 Data Validity and Reliability ......................................................................................... 32

4.5 Framework for Data Analysis ....................................................................................... 33
4.6 Limitations and Potential Problems ................................................................. 35
4.7 Ethical Considerations ......................................................................................... 36

Chapter 5. Data Analysis of Applying Marchand’s Information Orientation Theory to Sigma Kudos ................................................................. 37

5.1 Information Technology Practices ...................................................................... 37
  5.1.1 IT for Operational Support ............................................................................. 37
  5.1.2 IT for Business Process Support .................................................................... 37
  5.1.3 IT for Innovation Support ............................................................................... 38
  5.1.4 IT for Management Support .......................................................................... 38

5.2 Information Management Practices .................................................................... 40
  5.2.1 Sensing Information: Define the Purpose ....................................................... 41
  5.2.2 Collecting Information: Gather Data ............................................................. 42
  5.2.3 Organizing Information: Summarize the Current Situation ......................... 43
  5.2.4 Processing Information: Analysis the Situation .............................................. 43
  5.2.5 Maintaining Information: Prepare Solution Proposal and Make Report .. 46
  5.2.6 Three Other Projects .................................................................................... 46

5.3 Information Behaviors and Values .................................................................... 49

5.4 Conclusion ........................................................................................................... 49

Chapter 6. Discussion ............................................................................................... 51

6.1 Using Marchand’s Information Orientation Theory to Manage All Kinds of Information ........................................................................................................ 51
6.2 Getting and Serving Information Everywhere .................................................. 52
6.3 Classify Your Customers ..................................................................................... 52
6.4 Filtering Information ............................................................................................ 53
6.5 Reusing Information ........................................................................................... 53
6.6 Cooperate With Other Companies ..................................................................... 54
6.7 Using Current System to Most ........................................................................... 54
6.8 Read Culture Difference and Build Company’s Own Information Orientation Culture ........................................................................................................... 55
6.9 Quality Assurance ............................................................................................... 56
Chapter 7. Conclusion ........................................................................................................................................57
  7.1 Conclusion of the study ................................................................................................................................57
  7.2 Research Contribution ..............................................................................................................................59
  7.3 Further Research .......................................................................................................................................61
References ..........................................................................................................................................................62
Appendix A. The First Interview Questions and Answers ...........................................................................66
Appendix B. The Second Interview Questions and Answers .......................................................................70
Tables
Table 1 Mapping the value of information assets (KPMG, 1994) .................. 11
Table 2 The link between Theory, Research Objectives and Interview Questions .. 34
Table 3 Mapping SPI to Information Management Life Cycle .......................... 40
Table 4 Outline of the Relationship Between the Theory, the Fact of How Company Works and Some Comments ................................. 58

Figures
Figure 1 Information Orientation (Marchand et al, 2001) ............................ 5
Figure 2 The life Cycle of Information Management (Marchand et al, 2001) ........... 8
Figure 3 Value of information to the business (Ward & Peppard, 2002) ............... 11
Figure 4 A Theory of Information Behaviors and Values (Marchand et al, 2001) ... 14
Figure 5 Sigma Kudos’s Information Logistics (Sigma Kudos, 2005) .................. 20
Figure 6 Comprehensive SPI Analysis Method (Sigma Kudos, 2005) .................. 21
Figure 7 Information Analysis in SPI (Sigma Kudos, 2005) ............................ 23
Figure 8 Process Analysis in SPI (Sigma Kudos, 2005) ............................... 24
Figure 9 Qualitative data analysis process (Wolcott, 1994) ............................. 35
Figure 10 Sigma Kudos Management System (Sigma Kudos, 2005) ................. 39
Figure 11 Manufacturers of cooker (Sigma Kudos, 2005) ............................. 41
Figure 12 Components of the Product (Sigma Kudos, 2005) ......................... 44
Figure 13 The four areas for system analysis (Sigma Kudos, 2005) ................... 45
Figure 14 Process Analysis for the company (Sigma Kudos, 2005) ................... 46
Figure 15 Information Orientation Management ........................................ 51
Chapter 1. Introduction

1.1 Background
For decades, Customer Orientation, Competitor Orientation and Market Orientation have been well defined and examined in the marketing and strategic management literatures. Customer orientation emphasizes on driving business decisions to meet customer needs (Gulati and Oldroyd, 2005), while competitor orientation emphasizes on observing and responding to the competitive moves of competitors (Porter, 1985). Market Orientation was firstly introduced by Narver and Slater (1990), it expresses a marketing perception which put the customer's needs in the center of all company's activities. These strategic orientations help companies to adapt to customer needs and respond to rival company' moves, and thus result in superior performance (Narver and Slater, 1990).

As Drucker (1993) recognized the unique feature of market economy is organizing economic activity around information, while markets are far away from perfect, the growth of the global information and communication infrastructure, including the Internet, has made information becomes more important (Marchand et al, 2001).

According to Evans and Wurster (1997), customers, suppliers, employees and competitors are sharing a common flood of business and economic data from multiple communication channels. Even though customer orientation and competitor orientation may lead to superior performance (Narver and Slater, 1990), this kind of superior performance may, at least partially, come from strategic use of information and effective information-based decision making according to Lee and Tsai (2005) . Companies need to use information in their unique ways to gain competitive advantage.

“Information Based Organization” was firstly introduced by Peter Drucker in 1988 and it described the stages of organizations that could employ information effectively. In 1995, Nonaka, Ikujiro and Hirotaka Takeuchi created “Knowledge-Creating Company”, it means the company which is good at converting information into useful knowledge and innovation. Davenport (1997) proposed “Information Ecology” as an element for effective business model in information management. “Knowing Organization” was proposed by Choo (1998) describing an organization’s capabilities to integrate sense making, knowledge creation and decision making effectively.

In 2001, Marchand, Kettinger and Rollins surveyed over a thousand senior managers from nearly 22 countries and 25 industries to do an investigation about the connections between Information Orientation and Business Performance. Their investigation found out that organizations need to possess three capabilities: people, information and technology that associated with effective information use to improve business performance (Marchand et al, 2001).
1.2 The Company Sigma Kudos
Sigma Kudos is one of the global leading suppliers in the area of information logistics, working with information, its architecture and the design and delivery of the content. They develop software solutions for information management; produce effective information, diagnostic and training material. Most of their customers are in the area of telecom, software, automotive and industry sectors.

In this dissertation, we will analyze Sigma Kudos with three Information Capabilities which defined in Marchand’s Information Orientation theory. The Sigma Kudos Company locates in Växjö, Sweden. More detail information of the company will be showed in the following part.

1.3 Research Objectives and Research Questions
Marchand, Kettinger and Rollins (2001)’s Information Orientation theory brings new mind to company’s information management. It gives us a better understanding about nowadays company’s developing trend, in terms of information technology (IT) applications. But firstly, according to Aytes and Beachboard(2007), the theory contain explicit and quite useful IT management knowledge based on theoretical and empirical research, the content is most likely to be of use to experienced professionals possessing a wealth of practical experience, but for inexperienced professionals and students, the theory may raise more questions than they answer. They stressed that students lacking a sound experiential framework have a difficult time comprehending the challenges presented in implementing these prescriptions in practice. If we could do an analysis of Sigma Kudos by using Marchand’s Information Orientation theory, then we could have more practical understanding about Marchand’s Information Orientation Theory. If possible, we could find out more interesting aspects which information product Companies need to consider about.

Secondly, for a business organization, knowing the theory could help company to self-check their information capabilities more deeply. For example, Sigma Kudos is kind of company producing information as a product. They have their own information management process which we will introduce in the following part. During the interview with Niklas Malmros(Global Operation Manager at Sigma Kudos), he agree with me to do such a research, helping them to self-check the company and whether their information management process needs to improve or not. For the companies which want to achieve better business performance, applying Information Orientation theory may face problems such as lacking of infrastructure, process or information technology. By applying the theory to company, the company could know its position and find out some lacks or absences and make improvements.

Based on these thinking, we make the research questions of the dissertation as follows:
How could we have more practical understanding about Marchand’s Information Orientation Theory?

What could we learn from applying Marchand’s Information Orientation Theory to Sigma Kudos Company?

Therefore, the objectives of this study are the following:

- Get more practical understanding about Information Orientation Theory.
- Find out more interesting aspects which information product Companies need to consider about.
- Help Sigma Kudos self-check and find out the problems that the theory requires.

As this study is a master dissertation, the main objective will focus on the previous two and the research’s academic contribution.

1.4 Scope and Limitations

The research is based on an enterprise management level and it is a quite extensive topic. The topic requires quite lots of work experiences and knowledge about IT implement and Company management. This is challenging as the author does not always have deep enough knowledge in all aspects. Therefore this study is performed with some assumptions. These assumptions are made only when it is needed but are discussed in details with personnel in Sigma Kudos during interview questionnaires.

There are some other limitations in this study when using Marchand’s Information Orientation theory to do an analysis on Sigma Kudos Company. Firstly author might not fully understand Marchand’s Information Orientation theory in detailed level. Secondly, author could not get or release enough data to support an adequate analysis, because some of the data are business confidential.

1.5 Summary

A brief summary of each chapter in this dissertation shows below:

Chapter 1 gives a brief introduction of Marchand, Kettinger and Rollins (2001)’s Information Orientation theory, the company Sigma Kudos, research objectives, research questions, and research scope, limitations.

In chapter 2, theoretical background of the Marchand et al’s Information Orientation theory will be introduced in details. The theory consists of three parts:

- Information Technology Practices (ITP)
- Information Management Practices (IMP)
- Information Behaviors/Values (IBV)

We will try to find out these three information capabilities within Sigma Kudos in data analysis part.

In chapter 3, the Company Sigma Kudos will be described, includes
- Company’s introduction;
- DocFactory: Sigma Kudos’s main information tool to manage documentation projects which shows the first Information Capability in Marchand’s Information Orientation Theory: Information Technology Practices;
- SPI method (System Analysis, Process Analysis and Information Analysis): Sigma Kudos’s Information Management Life Cycle which is the second Information Capability that mentioned in the theory.

In chapter 4 Methodology part, the research strategy, research method, data collection method, data collection process and framework of data analysis will be introduced.

In Chapter 5 Data Analysis part, Marchand’s Information Orientation theory will be mapped to Sigma Kudos Company. We will mainly focus on the Information Technology Practices and Information Management Practices these two Information Capabilities.

Chapter 6 Discussion part, we will discuss what we have learned from applying the theory to Sigma Kudos. We find out the interesting aspects that are needed to consider about for Information Product Companies. In this part, we will discuss these interesting aspects, and among them, the main finding from this study is that we integrate resource and vision/strategy to the Information Orientation Theory as they are also the key areas that have an effective impact to a company’s business performance.

Chapter 7 Conclusion part, we will conclude the research and answer to the research questions which we made in Introduction part. The two questions are properly answered and the study reached our research objectives. Research Contribution also mentioned in this part. Firstly, the research gives us more practical understanding to Marchand’s theory; secondly, we think Marchand’s theory is a good guideline for Sigma Kudos as well as other information product companies; thirdly, we integrate resource and vision/strategy to the Information Orientation Theory. Further researches are suggested and described later.

Finally Appendixes include the interviews with Niklas Malmros (Global Operation Manager at Sigma Kudos).
Chapter 2. Marchand’s Information Orientation Theory

The theoretical background will firstly show the definition of the Information Orientation and its three vital information capabilities which is defined by Marchand, Kettinger and Rollins (2001). According to them, the three information capabilities will finally form an Information Culture within the organization.

2.1 Information Orientation

In 2001, Marchand, Kettinger and Rollins surveyed over a thousand senior managers from 169 senior management teams in 98 companies operating in 22 countries and 25 industries in an attempt to answer the question which shows below:

“How does the interaction of people, information and technology affect business performance?”

The result for the answer is Information Orientation. They give the definition of Information Orientation which is a new metric of effective information use. It measures the extent about senior managers perceive their organizations possess the capabilities which associated with effective information use to improve business performance (Marchand et al, 2001).

Information Orientation helps company to improve business performance by determining the degree to which a company possesses competence and synergy across the following three vital Information Capabilities. The three information Capabilities are main characteristics that Information Orientation Company should have.

![Figure 1 Information Orientation (Marchand et al, 2001)](image)

- Information Technology Practices (ITP) describes the capabilities of a company that effectively manage information technology (IT) applications and infrastructure to support their business operations, business processes, managerial decision making, and innovation.
● Information Management Practices (IMP) describes the capabilities that manage information effectively over the life cycle of information use, this life cycle includes sensing information, collecting information, organizing information, processing information, and maintaining information.

● Information Behaviors/Values (IBV) describes the capabilities that promote behaviors and values in its people for effective use of information.

While past scholars and consultants recognized the importance of these three information capabilities, but they were considered separately in isolated schools of thought and at different stages. In the Information Orientation Companies, the three streams should converge in the mind of senior managers and shape a new mindset concerning how to manage information, technology and people to achieve improved business performance (Marchand et al, 2001).

2.2 Information Technology Practices
As long as the company using Information Technology such as, hardware, software, application programs, telecommunications networks, and the technical expertise that support the information processing and communications activities at all levels of a company, the company will benefit from this in the following four elements (Marchand et al, 2001):

1) IT Operational Support
By implementing computer systems companies could achieve automate control of the business tasks. Information technology enables the lower-skilled workers improve their operation efficiency and perform responsibilities with high quality consistently.

There are three roles that IT for operational support could play in companies described by Marchand et al (2001):
● Increasing scale efficiencies in the operational activities of manufacturing and service.
● Processing some basic business transactions.
● Monitoring and recording the actions and performance of the operational employees when they carry out business tasks.

2) IT for Business Process Support
IT for business process support focuses on the implement of hardware, software, networks and technical expertise to facilitate the management of business process (Marchand et al, 2001).

As Marchand et al (2001) describes ‘IT for business process support represents an important step in connecting the decisions and information flows across business process with the decisions and transactions within functions and departments inside and outside companies. However, IT for both operational support and business
process support focus on institutionalizing and formalizing yesterday’s strategic decision.’

3) IT for Innovation Support
Before IT, innovation and research depend on ‘finding good knowledge workers and leaving them to their devices, only to measure how quickly and how well they produce outputs’ (Davenport, 1997). But now since 1990s, IT for innovation support was primarily driven by three types of IT developments (Marchand et al, 2001):
- Software-based innovation
- The internet and the management of documents
- The growth of global networking and interactivity

4) IT for Management Support
Generally, managers are concerned about three broad types of decision making: strategy, resource allocation and management control (Marchand et al, 2001).

Nowadays Decision Support System is a good example to explain IT’s managerial support. However, Decision Support System tended to have complicated interfaces and still required considerable programming; some of the systems are quite expensive but could not get the promising function (Marchand et al, 2001).

Executive Support Systems developed to equip senior managers with the hardware, software, networking and data retrieval capabilities to directly support their semi- and unstructured decision making and communications activities (Rockart and Delong, 1988; Kuo, 1999).

There are six key attributes of Executive Support Systems that changed mental models of managers (Rockart and Delong, 1988; Kuo, 1999):
- Access external information
- Help combine information from multiple sources
- Present information in more meaningful formats
- Improve analytical and modeling capabilities
- Help surface and test assumptions about the business
- Permit data access anytime, anywhere

Mangers using IT tools to assist anticipating market trends, evaluating business risks, and defending their market positions. They are more adaptable to gather and analyze data and information from rapidly developing business situations(Marchand et al, 2001).

2.3 Information Management Practices
Information management embodies policies, organizational provisions and a comprehensive set of activities associated with developing and managing the information resource (Ward& Peppard, 2002).
Marchand and Horton (1986) described information management as a set of activities that moved through a ‘logical succession of phases, each dependent on the other’. The information life cycle described by Ashby (1956) is a circuitous set of phases: collecting, organizing, processing, and maintaining information.

Nowadays, Kuhlthau (1991), Dervin (1992), and Choo (1998) identified a new fifth information management practice: Sensing. Information is sensed based on some perceived information need and collected in a formalized manner, organized in a format that could be used in an organization.

The following is diagram of the Life Cycle of Information Management

![Figure 2 The life Cycle of Information Management (Marchand et al, 2001)](image)

1) Sensing Information
Marchand, Kettinger and Rollins (2001) define sensing information as the phase in the information life cycle in which information is detected and identified concerning: Economic, social and political changes affecting the business; Competitors' innovations that might impact the business; Market shifts and customer demands for new products; and anticipated problems with the company's suppliers and partners.

According to Mintzberg and Henry’s (1975) investigation, over 20 years ago that the manager scan his or her environment for information, interrogates contacts and subordinates, and receives unsolicited information, the network is personal contacts that manager developed.

Marchand, Kettinger and Rollins (2001) suggest some way to sensing information:
- to identify changes in the broader social, economic, and political environment;
- to listen to customers;
- to monitor competitors; and
• to anticipate problems with suppliers and partners.

The following is the information that companies search for and could make influences when making enterprise strategy (Ward & Peppard, 2002):

• Access to new information about markets, customers, competitors, suppliers or other external bodies to improve competitiveness.
• Establishment of electronic links with external bodies, to speed up and improve communications and, in some cases, to lock in trading partners.
• Access to external information such as market research databases or database marketing facilities to gain external intelligence.
• Restructured existing information in order to meet the critical success factors of the business or its external partners.
• Capability to integrate and utilize multimedia data.
• Very fast access to integrated information so that visibility is provided from end to end of the key processes and information-based services can be delivered effectively throughout the processes.
• Access and filtering mechanisms for unstructured information to satisfy executive information needs relating to critical business issues.
• Performance measures to monitor progress on strategic factors.
• Modelling data to perform ‘what if’ analysis on crucial business issues.
• Better information about staff to enable more effective use of the human resource.

It is good that nowadays companies know what kind of information they need and can look for it. Market is always important information for the company to consider about. Besides that, both the internal information and external information of the company are important that could make changes to the company’s overall business strategy.

2) Collecting Information

According to Marchand et al (2001), to ensure the right information could be sensed in the phase of collecting information, people will:

• Profiling the information needs of employees to ensure the right information is delivered to them at the right time;
• Filtering information for managers and employees to prevent information overload;
• Identifying key knowledge sources so that employees can make use of the company's collective expertise; and
• Training and rewarding employees for accurately and completely collecting information for which they are responsible.

Although new information technologies enable organization to collect more and more data and information about their customers, operations, process and share information more broadly by internet technology, there are still some basic questions coming out when collecting the information:
1. Who needs information in the company?
2. What type of information is needed and how much?
3. Where is the information?
4. Why and how should people collect information?

Different companies have different answers to these questions. And from these questions, we could easily find out existing information flow that runs within the company and it is playing an important role.

3) Organizing Information
The organizing phase of the information management life cycle focuses on indexing, classifying, and connecting information and databases to provide access within and across business units and functions (Marchand et al, 2001).

Organizing information appropriately involves several critical decisions that managers and organizational members make on an ongoing basis.

First, it is necessary to know what categories that the selected information can be used in organizing information.

Second, making information 'available' through networks and databases does not always make it usable, unless organizational members can agree on shared language, terminology, and classification schemes for organizing the information sources and databases of a company. Moreover, information technology and networks may provide the technical means for organizing and connecting databases across a company, but the challenges of organizing information to share, and to use it across functions, professional domains, and different business units, are essentially human activities involving choices (Marchand et al, 2001).

Third, organizing information requires appropriate skills, expertise, and work habits that organizational member and managers must possess.

The KPMG (1994), as a global network of professional firms providing Audit, Tax and Advisory services, developed a framework to help in structuring the value of different types of information asset. Illustrated in the following Table 1, it can be very useful in reaching agreement among senior business managers as to its impact on business value as well as to the consequences of theft or damage.
<table>
<thead>
<tr>
<th>Types of information asset</th>
<th>Value/Importance defined by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price paid or potentially paid (IPR) less costs</td>
</tr>
<tr>
<td>Market and customer information</td>
<td></td>
</tr>
<tr>
<td>Product information</td>
<td></td>
</tr>
<tr>
<td>Specialist knowledge</td>
<td></td>
</tr>
<tr>
<td>Business process information</td>
<td></td>
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<tr>
<td>Management information and plans</td>
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<tr>
<td>Human resource information</td>
<td></td>
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<tr>
<td>Supplier information</td>
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<tr>
<td>Accountable information</td>
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</tr>
</tbody>
</table>

Table 1 Mapping the value of information assets (KPMG, 1994)

The collected information should be classified and measured. The following is a portfolio model defined by Ward & Peppard (2002) and used both to categorize applications and to rank the information portfolio:

![Figure 3 Value of information to the business (Ward & Peppard, 2002)]
Strategic
Information, both internal and external, that is crucial to strategic and competitive business initiatives and principally associated with business drivers, objectives or measures of success, represents the greatest potential value (Ward & Peppard, 2002).

The strategic information is crucial to Core Business ability and it is quite necessary to form an Information Project to enhance the capability of the Core Business Process, at least a good strategy (Ward & Peppard, 2002).

High potential information
High potential information is generally new information, with unproven value to the business. Its sources, structures and relationships may not be fully understood, but, as potentially valuable systems are being clarified, their information requirements must be confirmed in terms of defining the best way of satisfying business needs, so that they can be included in the information management umbrella at the appropriate time (Ward & Peppard, 2002).

Key Operational
The largest volume of information is probably associated with the key operational systems, integral to core operational processes and essential for their effective day-to-day running. Requirements here are likely to be driven by avoidance of disadvantage and may focus on greatly enhancing value through integration across applications and processes. It enables rapid and consistent communication, especially to the external interfaces, where strategic requirements take over (Ward & Peppard, 2002).

Support
Information contained only in support systems, though necessary, is not likely to contain much latent value. In some cases, it may even be a burden on the organization when it is constrained by legislation or bound by corporate instructions to supply or store information, without any business benefit being recognized. Effort expended on information management or integration should be kept to a minimum, consistent only with efficiency and necessity (Ward & Peppard, 2002).

4) Processing Information
In the step of processing information, people in an organization must be able to access appropriate information sources and databases before making decisions. People must actively engage in analyzing information sources to derive useful knowledge as inputs to make decisions (Marchand et al., 2001).

Processing information is critical to decision making in organizations. Likewise, decision making by managers and organizational members has an important impact on shaping the ongoing processing of information. Changing business conditions require managers to shift the criteria and focus of their decisions. Since managers
possess limited time, attention, and resources, changes in decisions that need to be made also shift the underlying processes of sensing, collecting, organizing and processing information into useful knowledge (Marchand et al, 2001).

5) Maintaining Information
Maintaining information involves reusing existing information to avoid collecting the same information again; Updating information databases so they remain up-to-date and refreshing data to ensure that people are using the best information; Getting output such as documents for the company which produces information as products (Marchand et al, 2001).

When we reusing the information, we need to avoid collecting, organizing and processing it all over again, the company could save lots of energy to finish a new but similar business goal, but necessary update of the information is quite important and different information fits for different situation, we need to sense new information that we have to consider about (Marchand et al, 2001).

It seems that maintaining information comes into the Knowledge Management area. Knowledge Management is a future tool that enables company running on the knowledge level. When the database of information comes to certain amount, the information could be transferred into knowledge which is a great fortune to the company (Marchand et al, 2001).

6) The Closing of the Cycle
After maintaining information, the new information will be sensed and compared with existing maintained database. It is important that database will always update information so the company could get the newest useful information. The company could also save from reusing information which is not needed to redo. So the cycle of information management is a closed-cycle (Marchand et al, 2001).

2.4 Key Behaviors and Values Lead to Effective Information Use
After the description of Information Management Life Cycle, we need to know how people behave in using information to improve business performance on an aggregate, rather than on an individual, level of analysis.

As information has become the key organizational “currency”, it has become too valuable for most managers to just give away. In order to make information-based organizations successful, companies need to harness the power of politics – that is, allow people to negotiate the use and definition of information, just as we negotiate the exchange of the other currencies (Davenport et al., 1993).

Marchand et al (2001) identified five additional behavior and value dimensions from the literature that we believe had direct and indirect impacts on creating proactive information use. These dimensions, drawn from human resources and management
control literature streams, included integrity, formality, control, transparency, and sharing. Proactive information use is dependent on a set of other behavior and value dimensions.

![Diagram: A Theory of Information Behaviors and Values (Marchand et al, 2001)]

**Figure 4 A Theory of Information Behaviors and Values (Marchand et al, 2001)**

1) Information Integrity
Information Integrity is the trustworthiness and dependability of information. More specifically, it is the accuracy, consistency and reliability of the information content, processes and systems. Information Integrity is a prerequisite for information management initiative. If the underlying information isn’t of a sufficient level of integrity, the success of business activities relying on the information will be limited (Marchand et al, 2001).

Information integrity is an organizational value exhibited through the behavior of managers and employees that conditions the use of information and knowledge for decision making in several ways (Marchand et al, 2001):

First, for information to be of value in decision processes, it should be free of distortions so that the information accurately reflects reality—the events, context, and actions as they occur.
Second, information can only contribute to decisions if it is used before decisions are made, and not just to justify decisions after the fact.

Third, effective decision making normally requires that all the pertinent information should be available before decisions are made.

Fourth, information integrity, at a minimum, should constrain people from using the organization's information for personal gain.

At the organizational level, integrity is based on the notion that a company is guided by a set of key principles that have to do with reasonable ethical behavior.

2) Information Formality
The next information behavior concerns the relationship between formal and informal information use in a company. Researchers found that both forms of communication and information use were necessary in organizations (Marchand et al., 2001).

Information formality means that business organizations will push to establish formal processes and information flows to achieve predictable business results, to assure appropriate controls are in place, and to deliver products and services in a consistent manner (Marchand et al., 2001).

Organizations should seek to supplement formal information for decision making using formal contacts and communications with people inside and outside the company to check the reliability of formal information, or to supplement the formal information available, if necessary (Marchand et al., 2001).

3) Information Control
In recent years, there has been a significant increase in managerial efforts to develop financial and non-financial metrics such as the ‘balanced scorecard’ and ‘economic value added’, and to interpret these performance criteria and measures at each level in the company. These are intended to build awareness among employees of the relationships between their job or work unit performance and the company’s overall performance (Marchand et al., 2001).

Companies where information about control is scattered among organizational units—each responsible for different performance criteria and different control systems—cannot exercise control over people or business processes very well. For example, in some companies, separate functional departments are responsible for different performance criteria and their control throughout the company such as: accounting controls (financial measures), service department controls (service measures), marketing and sales controls (customer satisfaction measures), and manufacturing controls (operational measures). Each of these departments develops and uses information to control its performance measures, but the information about
overall company performance is so scattered in separate units that it is difficult for the senior managers to exercise appropriate controls over people and processes (Marchand et al, 2001).

4) Information Transparency
Transparency is associated with four characteristics. First, transparency means being candid with one's thoughts-free from bias and accepting of the views of others. Second, transparency implies basic fairness-a person will be honest, impartial, and fair in dealing with decisions and situations that arise. Third, transparency, like sharing, requires trust between people-a sense of confidence that another person will not use your thoughts or information against you. Finally, transparency requires 'openness' to other people's thoughts and concerns even when the 'news' is negative or not good (Marchand et al, 2001).

This suggests that high levels of personal and organizational integrity are required for being transparent about 'bad news' or surprises inside a company (Marchand et al, 2001).

5) Information Sharing
It is the free exchange of nonsensitive and sensitive information. Sharing occurs between individuals in teams, across functional boundaries and across organizational boundaries i.e., with customers, suppliers and partners (Marchand et al, 2001).

There are some preconditions for sharing information: the first precondition is the existence of some common language and shared meanings among members of an organization. The second precondition is the existence of a prior relationship between members of an organization based on how much is known about people relative to their roles and positions in a company. The third precondition is the perceived level of trust among people who can share information. The fourth precondition is their needs to be a shared purpose or common stake or ownership of results. The fifth precondition is that sharing information must be part of the company’s culture---what organizational members are expected to do with information (Marchand et al, 2001).

There are many ways to share information: meetings, reports, e-mails, and memos, or informally through conversations in the hallway or outside of working hours (Marchand et al, 2001).

Within a company, sharing information happens both individually and between groups. It is a complex act. Information may be more freely shared among individuals or small teams than between functions or departments in a company. In addition, information may be shared inside a company, but may not be as readily shared outside the company with suppliers, customers, or partners (Marchand et al, 2001).
With the help of information technology (IT), information sharing can be encouraged across virtual teams and across processes like supply chains with suppliers, customers, and partners operating in a virtual network. As Charan (1991) says, sharing information openly, visibly, and simultaneously is one of the most important dimensions of sustaining a network over time. Over time, the free flow of information allows networks to become self-correcting.

6) Proactive Information Use
To have a bright future, organization need to develop a great foresight about tomorrow’s markets (Hamel et al, 1994). Gaining the foresight requires managers and employees to anticipate what cues, signals and trend lines that will be important in the future success before the information is also known by the competitors. Organizations need to look beyond the markets and customers to exploit their competencies in new directions. To do this effectively, managers and employees should actively seek out information about changes and trends in the company’s business environment before their competitors, before the future happens (Marchand et al, 2001).

Proactive information use involves how ‘well’ people think about using information to create or enhance products and services, actively seek out information about business conditions to test these ideas, and respond quickly to this information (Marchand et al, 2001).

The present study about the six information behaviors and values identified by Marchand et al. (2001) are also known as kind of Information Police, used by Strassamnn(1994), that the “information-based organization,” the “knowledge-based enterprise,” and the “learning organization,” forecasted by management experts that all require a free flow of information around the firm need to follow (Davenport, 1998).

As we discussed above in Information Management Life Cycle, these practices create the affective response needed to set the environmental preconditions for the more cognitive practice of sensing to occur. Acting on the information that is sensed and collected requires a company climate where people seek information eagerly and respond to it quickly. Managers in such a company must not only employ information in response to business changes effectively and rapidly, they must develop among organizational members a sense of urgency in sensing information that is useful, and sharing it effectively among other employees, in teams, and across functions (Marchand et al, 2001).

2.5 Information Orientation Culture
An information culture can be defined as the values, attitudes and behaviours that influence the way employees at all levels in the organization sense, collect, organize, process, measure, communicate and use information (Marchand et al, 2001). So the
previous three Information Capabilities we described could be collected and form the company’s Culture, the culture about information orientation.

But a Culture’s forming considers more than Capabilities. Marchand (2001) has identified four common information cultures that exist in organizations today. These are:

- **functional culture**—managers use information as a means of exercising influence or power over others;
- **sharing culture**—managers and employees trust each other to use information (especially about problems and failures) to improve their performance;
- **enquiring culture**—managers and employees search for better information to understand the future and ways of changing what they do to align themselves with future trends/directions;
- **Discovery cultures**—managers and employees are open to new insights about crisis and radical changes and seek ways to create competitive opportunities.

Each type of culture influences the way employees use information—their information behaviour—and reflects the importance that senior management attribute to the use of information in achieving success or avoiding failure (Marchand et al., 2001).

Marchand et al. (2001) described that companies who want to have their mature Information Orientation culture will not be attained by information systems and processes alone, but through people. The general context of effective information use in business organizations is people centric and influenced by more general cultural characteristics that, when present, help to increase IO maturity. The following lists more mature IO cultures companies they have:

- **Selflessness.** People could use information to support the organization's interests and do not act solely on their own self-interest. They are motivated to proactively share and use information that not only benefits their own needs in the company, but others' needs as well.
- **Explicitness.** People could make their tacit knowledge more explicit by articulating and communicating their knowledge and ideas in a way that can be used and developed to attain organizational goals.
- **Clear focus.** People are able to focus their scarce attention and time on the right or relevant information. They understand what information seeking is relevant to improve their own performance as well as that of the organization.
- **Great learning capacity.** People are willing to proactively acquire new knowledge, question existing ways of solving problems, and learn from this information to change. They are willing to openly share and discuss errors and failures and find ways to fix them.
Great flexibility. People do not resistant to change. They could accept continuous change as a natural feature of modern organizational life and are willing to respond quickly to new challenges. Their flexibility leverages learning capacity to permit emergent situations and strategies to be addressed.

However, establishing an effective information culture can be a challenge. Davenport (1994) captured this point succinctly when he noted that 'effective information management must begin by thinking about how people use information—not with how people use machines'.

Davenport (1994) describes that changing a company’s information culture requires altering the basic behaviors, attitudes, values, management expectations and incentives that relate to information. ‘Changing the technology only reinforces the behaviors that already exist.’
Chapter 3. Sigma Kudos Company

3.1 Company Introduction

The operations of Sigma Information Design started in the early 1990s as a department of 5 consultants. An unbroken period of expansion began in 1994, and by 1997 the operations had grown to about 30 consultants.

In 1996 Kudos opened an office in Wilmslow, UK. In 1999 Kudos won a long-term outsourcing contract with Hewlett Packard Telecommunications Division and established a third office in Grenoble, France. As a result of a global outsourcing contract with Nokia in 2000, Kudos set up offices in Helsinki, Finland and Budapest, Hungary in 2001.

Currently, the company employs over 350 specialists within the fields of technical and product documentation and related services such as Embedded Design and Information Management, with offices in Sweden, Finland, Hungary, Ukraine and China.

Sigma Kudos is a global market-leading supplier of information solutions for after-market information and has extensive experience in handling customers' needs for effective comprehensive solutions for information logistics. The business scope is to enhance the product knowledge of the end customer – that is, to ensure that the end customer understands and favors customer's product. It comprises all components within Information Logistics. Services in information logistics are provided under the Sigma Kudos trademark.

The company works with information, its architecture and with the design and delivery of content. They develop software solutions for information management; produce effective information, diagnostic and training material using superior processes, tools and methods with outstanding results.

Figure 5 Sigma Kudos's Information Logistics (Sigma Kudos, 2005)
Sigma Kudos takes on the total responsibility for the entire chain of Information Logistics as shows above in figure 5. To enable customer product knowledge, Sigma Kudos provides information services by information development, translation, and publication.

3.2 SPI Analysis Method
SPI is Sigma Kudos’s analysis method to investigate conditions, requirements, possibilities, and consequences of changes in information, processes, and systems for managing information in an organization. It stands for System Analysis, Process Analysis and Information Analysis.

The purposes of creating SPI analysis method are:
- To attain greater quality during the implementation of analysis assignments;
- To attain greater quality on the services/concepts/products/solutions that we supply, based on the analysis;
- To attain greater uniformity during the implementation of analysis assignments;
- To become less dependent on individuals during the implementation of analysis assignments;
- To reduce risks and increased cost efficiency during implementation of analysis.

The SPI analysis method can be divided into two overall sections: the more general SPI inventory and more far-reaching SPI analysis. It consists of method documents, checklists, templates, previous analyzes and reference documents. Using following figure, we could see the whole structure of the SPI analysis method:

![Figure 6 Comprehensive SPI Analysis Method (Sigma Kudos, 2005)](image-url)

This analysis method tries to answer these questions:
- What are the target groups for our information?
- What information products will we offer them?
- Which channels will we use: paper, web, and other channels?
- How do we increase the degree of reusability?
- How do we administer translations in 12 languages?
- What system can handle our production of 12 000 pages?
- XML?
- Which editor has the best usability?
- How do you structure a spare parts manual?
- How do we ensure traceability and follow-up?

These are practical questions when using the SPI analysis method to achieve projects.

### 3.2.1 SPI Inventory

An SPI inventory is a comprehensive analysis of a client’s system, process and information situation. Its purpose is to make an inventory of the current situation and to draw up a plan of action for the continued analysis work.

The first phase is where to define goals, map key factors (problems and opportunities), calculate the time for implementation of the analysis and review all resources. This phase usually takes 1-3 weeks.

The result of SPI inventory is:
- General mapping of the current situation
- A plan of action for the continued SPI-analysis including a time schedule and cost calculation

It is also where we determine the SPI-mix, that is to say, should we focus on system issues, process issues or the actual information.

### 3.2.2 SPI Analysis

An SPI analysis should be implemented in six different steps, where everything should be possible to present step-by-step to, among other things, support the credibility of the analysis result. The work is divided into the following steps:

1. Define the purpose
2. Gather data
3. Summarise the current situation
4. Analyze the situation
5. Prepare a solution proposal
6. Report

Due to business confidential, we will not describe the details of these steps, but these are quite feasible actions to carry out the analysis.
SPI has three analyses: Information Analysis, Process Analysis and System Analysis. Each analysis follows the above six steps and we discuss about these three analyses in the following section.

3.2.3 Information Analysis
To decide what information the different target groups need, we have to ask ourselves some questions. What is the information object? What has to be done? What previous knowledge does the target group have? When does the target group need the information to be able to perform their jobs?

During the information analysis, we:
- Determine the targets for the information.
- Define target groups.
- Define the information structure.
- Choose the media distribution channels.

An important part of the information analysis is often to investigate the potential of reusing information. A lot of information today is produced and handled in several different parts of the organization and this entails high costs and lack of quality. The aim is to identify the source of the information that makes it possible to be reused from there, see the figure below.

![Figure 7 Information Analysis in SPI (Sigma Kudos, 2005)](image)

3.2.4 Process Analysis
Harrington(1991) and Davenport (1993) defined the Business Process as:
“A related group of steps or activities in which people use information and other resources to create value for internal and external customers. These steps are related in time and place, having a beginning and end, and having inputs and outputs.”

The efficiency of a business process and its ability to produce what the customers
want are strongly influenced by process characteristics including the degree of structure, the range of involvement, the level of integration, rhythm, and complexity (Alter, 2001).

The process analysis results, among other things, in the process diagram which describes how the information is to be managed after changes to the existing processes. Management here signifies to create, store, administer, distribute, present and file. When we make this analysis we must first map out the current situation. Suitably in the form of one or more flow charts, that describe how the information flows today – between different instances, functions and processes. The next step analyzes how the processes should work in an ideal world, and usually highlights some opportunities for change and rationalization. Furthermore, we note which systems, software and other tools are needed to process, manage and present the information. Consequently, the process analysis sometimes touches upon the system analysis.

When we analyze the current situation, we will probably see some possibilities for changes and efficiency improvements. A process analysis should give answers to how to efficiently manage information in order to reach the goals.

![Process Analysis Diagram](image)

**Figure 8 Process Analysis in SPI (Sigma Kudos, 2005)**

A process analysis has to find the best way to manage your information to be able to reach your goals.

### 3.2.5 System Analysis

In 2009, Beynon-Davies defined System Analysis as: The part of the development process devoted to eliciting and representing the requirement for systems.

System Analysis involves identifying and specifying requirements for the new information system. The functionality of the information system should be described and concentrate on what an information system should be able to do (Beynon-Davies, 2009).
According to Steven Alter (2001), System Analysis is a very general process of defining a problem, gathering pertinent information, developing alternative solutions, and choosing among those solutions. Although different authors express it differently, systems analysis is basically a four-step decision-making process:

- Defining the problem
- Describing the situation in enough depth
- Designing potential improvements
- Deciding what to do

In Sigma Kudos, the system analysis means that, in an existing current situation, we analyze and penetrate the situation with the intention of achieving a better, more effective, modern and/or usable technical system solution than the existing one. A system analysis can also be made in those cases where a decision has been made to introduce a new system or new functions. The result of the system analysis must be a solution proposal and/or a functional specification and/or a requirement specification. The system analysis precedes the design and implementation of the system. Irrespective of the reason for a new solution, or a new system, we must start from a documented current situation. Either in the form of an existing system, or based on functional requirements of something to be added, introduced or modified. During the analysis of the information management system, it is often appropriate to divide the system into subsystems according to the three processes:

- Create
- Manage
- Distribute/Publish

Frequently, it can be fitting to start the analysis from the end of the process chain, i.e. analyze how the information is distributed and published. A system analysis provides answers to the questions: who is to use the system, what the system is to do, and where and when it is to be used. The analysis consists of three phases: to understand the current system, to identify improvements and to develop a concept for a new system. The last phase only takes place if you have determined that the new system is needed. It is possible that the current system is, however, the best option.

3.3 DocFactory

Sigma Kudos has a working system/platform named: DocFacotory which is developed by themselves. They use this system/platform carrying on their ordinary work. They still improving this platform and adding new technologies such as E-Learning and Flash Movie these new technologies which could bring good user experiences to make their product: information could be accepted by customers easily.

DocFactory is created as a result of literally hundreds of man-years of experience from the technical documentation business. It features all the functionality needed to manage a documentation project:

- topic management,
- project and task management,
workflow,  
approval flow,  
translation management,  
illustration and multimedia management,  
publication flow,  
reuse,  
phrase management and much more.

DocFactory has its own features:

- **Topic Based Information** By organizing content into topics, the biggest challenges facing technical publication groups are met, and authors can achieve several goals simultaneously:
  - Content is readable even when accessed from an index or search, not just when read in sequence as part of a chapter in a manual.
  - Content can be organized differently for online and print purposes. Authors can create task flows and concept hierarchies for online orientation, and still compile a print-friendly output that can be published as a manual.
  - Content can be reused in different information products. Since a topic is written to make sense when accessed randomly (for example, by search), it should also make sense when included as part of different products’ deliverables.

- **Efficient Information Management** Traditional content management systems do not provide complete coverage of information management functionality which imposes a huge overhead of manual work. DocFactory focuses on reducing this overhead by implementing integrated management and reporting functions.

- **Topic Applicability** DocFactory implements the concept of applicability mapping which allows users to tag content based on what it is applicable for, for example, a product, function, or a process, and apply consistent metadata for categorization.

- **Content Reuse** DocFactory enables easy identification of reusable information chunks, including version and variant management of those reused topics. DocFactory also implements support for reusing standard phrases and terms, enabling reuse on paragraph level.

- **Version and Variant Management** DocFactory versioning allows organizations to create new versions of content, to track which version is currently published, and to maintain previous versions for auditing or recovery purposes.

DocFactory helps organizations meet the challenges of managing changing product and content variants which derive from a continuous flow of new
products, content updates, additional languages, and additional distribution channels.

- **Phrase Recognition** DocFactory implements phrase recognition when writing content, enabling users to get direct access to predefined and approved standard phrases.

Based on DocFactory, Sigma Kudos gain Information Technology Practices which enable Sigma Kudos effectively manage appropriate IT applications and infrastructure in support of operational decision making and communication processes.

### 3.4 Cooperate Projects that Develop Line of Business

Sigma Kudos is involved in projects with the purpose of developing line of business. These are a few:

1) **University Game Award**
   University Game Awards is a Swedish-Ukrainian student technology contest, focused on finding solutions to real-world issues. The 2010 University Game Award will be held in two universities – Växjö, Sweden and Kharkiv National University of Radio and Electronics, Ukraine.

   The University Game Award is organized by Boss Media, Sigma Kudos and Eclipse SP. Partners of the contest are Linnaeus University and Kharkiv National University of Radio Electronics.

2) **Substrate**
   Substrate is a co-production where researchers from the Medea Collaborative Media Initiative at Malmö University work together with Sigma Kudos. The goal is to develop new tools for producing and using technical information, based on a collaborative media approach where the traditional distinction between producers and consumers is challenged.

   The name of the project — Substrate — is intended to evoke the idea of hospitable conditions for something to grow. In this case, what should grow on substrates is of course knowledge.

3) **Higher Vocational Education Course in Technical Information**
   Sigma Kudos is part of the steering group for a Higher Vocational Education Course (HVEC, Kvalificerad Yrkesutbildning in Swedish) in Technical Information. They also offer internships for the students. The course is given by the Nordic Business Institute, NBI.

   Sigma Kudos realizes cooperation with other companies could enlarge market and gain experiences from the cooperation. It will bring great potential resources to the company especially by setting up some projects and research topics with universities. We will discuss this in the following part.
Chapter 4. Methodology

After describing Marchand’s Information Orientation theory and an introduction of Sigma Kudos, we need to figure out the method of applying the theory to the company.

4.1 Research Method

We will use Case Study as this study’s research method to perform the analysis of applying Information Orientation theory to Sigma Kudos Company. What is a case study approach and why is it suitable for this research? Cohen and Manion (1995) describe a case study:

“...The case study researcher typically observes the characteristics of an individual unit – a child, a class, a school or a community. The purpose of such observation is to probe deeply and to analyze intensively the multifarious phenomena that constitute the life cycle of the unit.”

According to this definition, a case study is therefore concerned with close observation of how a particular population group behaves in a particular context.

A case study approach facilitates the drive to probe deeply into how information orientation Company could have a better business performance. However, there are some disagreements when constituting a case study. Yin (2003) defines a case study in a different way:

“A case study is an empirical inquiry that
● Investigates a contemporary phenomenon within its real-life context, especially when
● The boundaries between phenomenon and context are not clearly evident. ”

Yin is trying to distinguish a case study from other research strategies. An experiment, he argues, intentionally separates phenomenon from context; historical research, although integrating phenomenon and context, normally deals with non-contemporary events; surveys can investigate phenomena and context together, but lack the in-depth investigation of a case study approach. Case study research is a detailed and time-consuming undertaking.

In this study, we will apply Marchand’s Information Orientation theory to the information technology application system of the Sigma Kudos by using Case Study methodology.
Case Study is generally considered to be a qualitative study (Yin, 2003). Bell (2005) states that researchers ‘adopting a qualitative perspective is more concerned to understand individuals’ perceptions of the world. They seek insights rather than statistical’ interpretations of the world. So a qualitative method was chosen based on the research problem and its purpose. In this type of method skills and experience of the researcher impact the analysis of the data. The information was collected through a qualitative method. Quantitative results are obtained through statistical methods or any other procedure of quantification; quantitative methods use measurement while qualitative methods do not (Ghauri & Grenhaug, 2005), therefore this research falls in the qualitative side.

In the book “Qualitative Research in Information Systems”, Myers & Avison(2002) described there are three kinds of Qualitative Research from philosophical perspectives:

**Positivist Research:** assume that reality is objectively given and can be described by measurable properties, which are independent of the observer (researcher) and his or her instruments. Positivist studies generally attempt to test theory, in an attempt to increase the predictive understanding of phenomena. So this method will be used in this study to test the theory in the company. Case study will be the Sigma Kudos Company itself.

**Interpretive Research:** Start out with the assumption that access to reality (given or socially constructed) is only through social constructions such as language, consciousness and shared meanings. Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them and interpretive methods of research in IS are ‘aiming at producing an understanding of the context of the information system, and the process whereby the information systems influences and is influenced by the context’ (Walsham, 1993). After the data collection and description, the data will be interpreted and organized into meanfully ideas which could connect with and prove the study’s aim.

**Critical Research:** Assume that social reality is historically constituted and that it is produced and reproduced by people. Although people can consciously act to change their social and economic circumstances, critical researchers recognize that their ability to do so is constrained by various forms of social, cultural and political domination. The main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be emancipator, that is, it should help to eliminate the cause of alienation and domination.

One thing has to say that the three research epistemologies are philosophically distinct (as ideal types), but in the practice of social research such as this study, these distinctions are not always so clear-cut. So beside positivist research method, we could also use interpretive research and critical research in this Case Study.
4.2 Data Collection Method
There are many methods of collecting data and the main methods include: questionnaires, interviews/communication, focus group interviews, observation, etc. (Ghauri & Grenhaug, 2005). In this study, we used all of these four data collection methods.

Interviews, often considered "the most efficient data collection method", were the main communication medium selected for this dissertation. There are three types of questions that can be asked in interviews (Ghauri & Granhaug, 2005):

- Structured - questions and answers are predetermined
- Unstructured - questions are more or less predetermined, answers are not predetermined, the respondent can use his/her own words
- Semi-structured - questions are predetermined, answers are not predetermined, the respondent can use his/her own words

The unstructured and semi-structured questions were used in this two times interviews. The aim of the first interviews is getting to know each other, introduce each other, collect some basic information that describe about the company, about how they do things and using which kind of systems. Therefore the questions needed to be designed in advance and answered with the interviewee’s own words. Prior to the interviews some questions were predetermined, but as the interview took place, several new questions arose. Using structured interviews would have limited the information collected through the process, by not letting the respondents express themselves widely, with no constrains.

Selecting the means by which to collect empirical data is just as important as choosing an appropriate research strategy (Ghauri & Granhaug, 2005). This research is interested in capturing qualitative data. Qualitative data will be obtained primarily through the vehicle of interviews.

The different types of interviews used according to the communication media used are: personal, telephone, email and Skype etc. Personal, telephone, Skype and email interviews were used in this research. Personal interviews compared with different communication mediums such as video conferencing, telephone and email, have the most information richness (Hislop, 2005); Face-to-face interactions help the development of trust with the personnel and to get a rapid high-quality feedback (Hislop, 2005). Face-to-face interaction helps me a lot when I contact with the manager of the company and most of the interview questions were answered properly.

Emails are an asynchronous, informal, spontaneous and geographically independent media that makes it suitable for situations where the need for formality and information richness is not needed (Hislop, 2005). Emails were the second medium (not the main one) for exchanging information with the personal of the company when it was either a simple issue/question, or when response could not wait until the next formal appointment or visit to the company. Email is the best tool that
transferring file that I need from the company, and when you are not so sure whether the contactor busy or not right now, just write an email.

The question of how to record the interviews is one that has been given much consideration in this case study. Taking notes as respondents talk is one simple alternative. However, it is bad to write down as respondent is talking, and it will lead to failing to response and lose fully attention and, in turn, perhaps omitting crucial comments and nuances, together with the problem of having to interpret summary comments some time after the event, in the end made this mode of recording unsuitable. Instead, all interviews will be recorded by recorder. All of these data could enrich the qualitative data.

Focus group interview is also used in this study, by using this method we discussed and decided our thesis’s topic, we collected all the required information for the thesis and discussed about the interesting topic which shows in the discussion chapter.

Observation method is used as the necessary method to find out all the need information and materials for investigation of three information capabilities of Sigma Kudos. For example, how employee use DocFacotory and SPI method to improve their working skills, how company provoke employee’s innovation passion etc.

4.3 Data Collection Process
The first time I met with Niklas Malmros(Global Operation Manager at Sigma Kudos) and Fredrik Wenneberg(Sigma Kudos’s China Site Manager) was on 3rd of December, 2009, introduced by Diana Unander from studenter I Regionen as she contacts with the company in the beginning. From the meeting and their presentation, I got some basic information about the company. At that time, we have agreed that I will make internship in the company, but the topic for the dissertation is not discussed till next time.

Second meeting was held in Kudos company, Niklas Malmros asked Tomas Eriksson (the main chief engineer) to show the projects they have done by using DocFactory, the main tool they are using to carry on all their projects. They showed me the projects they have done for their customers. After that, we were supposed to think about the DocFactory and try to find some ideas which project we could do in the dissertation.

Niklas Malmros, Tomas and I had the third meeting in Sigma Kudos Company. We discussed about the project that I could do in my thesis, we decided to take a project about Mobile Repair Project. This project was abandoned later as I could not interview the mobile repair guys.

Later I decided to make a research about Sigma Kudos based on Marchand’s Information Orientation Theory. I contacted with Niklas Malmros and hoped to
interview him and discuss with him about this idea. Because Marchand’s theory is based on an enterprise level, I need to do study about the company in a practical way by interviewing the company’s senior manager: Niklas Malmros in Sigma Kudos. After getting his permission, I started to work on the interview questions which all are based on the theoretical framework.

The interview takes two times with Niklas Malmros. The following is the brief summary of first interview: How do you sensing information, collecting information, organizing Information, processing information, measuring information and maintaining Information. Later he introduced the method they are using to deal with information project: SPI, and some projects that have been done in SPI method. He sent me all the materials that I need for data analysis.

The second time three people joined in the discussion, my supervisor, Niklas Malmros and me. In the beginning, Niklas Malmros introduced Sigma Kudos’s developing history and main business progress to us, also DocFactory and SPI method. This time, we have a clear understanding about Sigma Kudos’s SPI method and we decided what we should do in our study. More data were collected from Niklas Malmros this time and more questions were answered based on the research questions.

The following is the record of the second interview:
Niklas Malmros briefly introduced Sigma Kudos’s developing history and main business progress, DocFactory and SPI method. We talked about the other two aspects of Information Capabilities of the Information Orientation Theory. More questions are asked this time and more interesting topics have been discovered as we will show in discussion chapter.

The two interviews are the most important materials for this dissertation, and most of the findings we will do in the data analysis part will take references from these interviews. In Appendix, the two interviews are recorded in text by details.

4.4 Data Validity and Reliability
Data’s reliability and validity are rooted in positivist perspective research which is the method we use in this study and discussed above, so we have to think about the data’s validity and reliability.

Patton (2001) claims that validity and reliability are two factors, which any qualitative researcher should be concerned about, while designing a study, analyzing results and judging the quality of the study.

To ensure reliability in qualitative research, examination of trustworthiness is crucial (Seale, 1999). Kidder and Judd (1986) identified reliability as demonstrating that the operations of a study-such as the data collection procedures-can be repeated, with the same results. The data we collected from Sigma Kudos could be verified and repeated.
by anyone. The results and findings of this study also could be reproduced by everyone.

There are four tests as the criterion on judging the quality of the study (Kidder and Judd, 1986), three of them judge the validity of the study:

- **Construct validity**: establishing correct operational measures for the concepts being studied. Construct validity concerns with the issue that a case study investigator sometimes would use “subjective” judgments to collect the data. Using multiple evidence sources is one of the principles when we collecting data. Based on Marchand’s Information Orientation Theory structure, we made interview questions and collected all the information from different sources.

- **Internal validity**: establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationship. During the data analysis, all the data collected could pattern-matching and address rival explanations in this study, the manager’s answers to the interview questions consistent to the information I get from other sources such as other people in the company and the company’s website.

- **External validity**: establishing the domain to which a study’s findings can be generalized. External validity is a kind of test measuring whether a study’s contribution can be generalized beyond the current case study, we could not make it in this single case study, so we need to do it in future study.

All the data were collected from in-depth structured interviews, participant observations, and documentation, from reliable sources and respondents who have several years of experiences in the information management fields. The interview questions were asked based on Marchand’s Information Orientation Theory framework to ensure the validity of the result. All of this could prove the validity of the data.

**4.5 Framework for Data Analysis**

All the data are collected from interviews, emails, skype etc. includes Sigma Kudos Company’s introduction, manager’s point of view of Information Orientation, SPI Analysis Method and DocFactory. We will organize and map these data into Marchand’s Information Orientation theory.

The following table is the link between Theory, Research Objectives and Interview Questions:
<table>
<thead>
<tr>
<th>Theory</th>
<th>Research Objectives</th>
<th>Interview Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Technology Practices</td>
<td>1. Find out the Information Capabilities of Sigma Kudos.</td>
<td>What do you think about Sigma Kudos’s Information Technology Practice?</td>
</tr>
<tr>
<td></td>
<td>2. To find out the influence of Information Technology Practices to the company,</td>
<td>• IT for Operational Support</td>
</tr>
<tr>
<td></td>
<td>3. What is the company’s attitude about it?</td>
<td>• IT for Business Process Support</td>
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<tr>
<td></td>
<td></td>
<td>• IT for Innovation Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• IT for Management Support</td>
</tr>
<tr>
<td>Information Management Practices</td>
<td>1. Find out the Information Capabilities of Sigma Kudos.</td>
<td>What is your idea about Sigma Kudos’s Information Management Process?</td>
</tr>
<tr>
<td></td>
<td>2. To discover how the company manage the information</td>
<td>• Sensing Information</td>
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<td></td>
<td>• Collecting Information</td>
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<td></td>
<td>• Organizing Information</td>
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<td></td>
<td></td>
<td>• Processing Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Measuring Information</td>
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<tr>
<td></td>
<td></td>
<td>• Maintaining Information</td>
</tr>
<tr>
<td>Information Behaviors and Values</td>
<td>1. Find out the Information Capabilities of Sigma Kudos.</td>
<td>What do you think about Sigma Kudos’s Information Behaviors and Values?</td>
</tr>
<tr>
<td></td>
<td>2. What are the company’s employee’s behavior and values.</td>
<td>• Information Integrity</td>
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<td>• Information Formality</td>
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<td>• Information Control</td>
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<td></td>
<td>• Information Sharing</td>
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<td>• Information Transparency</td>
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<td></td>
<td></td>
<td>• Information Proactiveness</td>
</tr>
</tbody>
</table>

Table 2 The link between Theory, Research Objectives and Interview Questions

The table maps the dissertation’s theoretical background, research objectives and interview questions to each other which also show the whole structure of the dissertation.

The Figure 9 graphically shows an illustration of the approach that will be adopted to analyze data from this case study, based on the iterative process of description, analysis and interpretation (Wolcott, 1994) of the collected data, particularly with regard to extracting and understanding emerging themes. However, analysis of qualitative data is not a linear activity and requires an iterative approach to capture and understand themes and patterns (Miles and Huberman, 1984; Creswell, 1997).
4.6 Limitations and Potential Problems

There are limitations of this research. Firstly, Case Study itself has some problems. Case study intentionally separates phenomenon from context; historical research, although integrating phenomenon and context, normally deals with non-contemporary events; interview can investigate phenomena and context together, but lack the in-depth investigation of a case study approach. This study will unavoidably choose limited time to do such a investigation about the company which may not reflect the really situation about the Sigma Kudos Company.

Case study research is a detailed and time-consuming undertaking and I do not have enough time on the investigation, neither to get enough detail information about the company.

Only Interviews, Emails, Telephone and Skype are used in the data collection method. But they are the most efficient way of communication while there is no other better option.

The person I interviewed with is only one manager in one company which is a great limitation. But the manager has been worked for more than 17 years of manger experience in different companies, which in some way make the interview as a wonderful dialog.

All the data I got from Sigma Kudos is also a great limitation. Although there are different sources: not only from the manager, but also the company’s website, also the website that the company cooperates with Malmö University.
4.7 Ethical Considerations
The ethical problems raised by applying information and communication technologies to a range of policy sectors involving the transfer of sensitive personal data about individuals has so far been largely considered in the dissertation.

This research involves the collection of corporate and personal information from several times communication. All of these data information will be showed according to company’s level of confidentiality and policy. So the dissertation does not violate their confidentiality policy.

During the interview, one question has been asked about the policy of sharing information in the dissertation. Niklas Malmros told me all the information and company’s name and manager’s name could be showed on the dissertation without a problem but not the customers’ name and information.
Chapter 5. Data Analysis of Applying Marchand’s Information Orientation Theory to Sigma Kudos

In this data analysis part, we will map Marchand’s Information Orientation theory to Sigma Kudos, using the documents we collected from Sigma Kudos and the interviews with Niklas Malmros. The analysis mainly focuses on Information Technology Practices and Information Management Practice these two parts.

5.1 Information Technology Practices

In this part, we will discuss about Sigma Kudos’s Information Technology development and progress. Information Company such as Sigma Kudos implements some hardware and software systems to support company’s Information processing and communication activities. The main systems are: DocFactory and SPI method which we have mentioned before.

5.1.1 IT for Operational Support

This operational support enables the lower-skilled employees could follow some routings to perform their work efficiently and finish the work with good quality.

As Sigma Kudos is an Information Logistics Company, in other words, they produce Information as a product. So they need efficient systems which allow them manage information properly.

The main tool they mainly use DocFactory is a full-blown professional tool, created as a result of literally hundreds of man-years of experience from the technical documentation business. It features all the functionality needed to manage a documentation project: topic management, project and task management, workflow, approval flow, translation management, illustration and multimedia management, publication flow, reuse, phrase management and much more. It is a nice tool enable employees in Sigma Kudos could do their job quite well.

The DocFactory enables the lower-skilled employees and new comers follow some routings to perform their work efficiently and finish the work with good quality.

As we described before, DocFactory bring great convenience both to information producers and information consumers. It is similar to Microsoft Office Word 2007’s interface which enables employees could manage it and use it in a short time.

5.1.2 IT for Business Process Support

Sigma Kudos has a main business process SPI method which implements company’s resources to facilitate the management of business process.
In SPI method, Sigma Kudos considers System Analysis, Process Analysis and Information Analysis these three business process aspects together.

Sigma Kudos is using this SPI analysis method to serve so many companies during these years and these customers are satisfied with this method. This method is come from the Kudos’s long time experiences and the result illustrate that they find a good method serving their customers with a good performance.

In the second part of this data analysis, we will discuss about the Information Management Life Cycle, and Sigma Kudos’s SPI method is also a information management process and created by Sigma Kudos and it is quite fit for the Information Management Life Cycle which mentioned in the Marchand’s Information Orientation Theory.

In another way, DocFactory is a nice platform which enables Sigma Kudos carries on business process well. Efficient Information Management traditional content management systems do not provide complete coverage of information management functionality which imposes a huge overhead of manual work. DocFactory focuses on reducing this overhead by implementing integrated management and reporting functions.

DocFactory is designed that could be used in every field of business, serve every business and help them writing document about how to use their products. This characteristic is like Windows operation system, adaptable to everyone who uses the computer. So they have a great potential by this Core Business Process System to gain more customers in every businesses.

5.1.3 IT for Innovation Support
Promoting employees’ Innovation is always a topic for senior managers to consider about. But I could not find out any systems or information that directly supports the company’s innovation.

In other way such as building global network and interactivities, DocFactory in some way do the functions of this kind of innovation support. DocFactory is still under developing when innovation and new requirements from customers are needed. Actually this progress shall never have an end as long as customers’ requirements continue.

SPI was a great milestone for Sigma Kudos dealing with business projects. As long as the customers’ requirements change all the time, the method SPI needs to be adaptable to the new requirements. This change to SPI method also needs innovation thinking and progressing.

5.1.4 IT for Management Support
In Sigma Kudos, using information technology (IT) to improve management support is always on the routing. The company’s intranet was established to support management via company’s policies, international standards, and procedures that all employees need to follow.

This Sigma Kudos’s intranet contains:
- Some of the policies that are written in company’s “Code of Conduct”.
- The procedures are used for employees to follow and produce good quality information products.
- We could also find the procedure which is described in DocFacotory’s user manual, guiding users how to use DocFactory and produce high quality documents.
- The instructions for employees how to finish a SPI report are written in SPI’s manual.

All of these policies, standards and procedures are used for management of quality control of the information products. At the heart of Sigma Kudos is Quality Management System, which is the key to managing processes. The management system is critical for developing and delivering quality services as well as satisfying the customers’ quality requirements, complying with regulations, or meeting environmental objectives.

The Sigma Kudos Management System is ISO 9001:2000, ISO 14001:2004 and ISO 27001:2005 certified. These certificates are tokens of process focus and commitment to delivering services of the highest quality. The Management System is an integrated part of all our projects and services. The ISO certification also requires demonstrating measure performance through management systems goals and key performance indicators.

Figure 10 Sigma Kudos Management System(Sigma Kudos, 2005)

ISO 9001 is a generic global standard for the management of quality in organizations of all sizes. The standard is fundamental for our quality management and its basis is applied to the way we run our Management System.

ISO 14001 is a standard that covers environmental management. It helps us set and manage our environmental performance.

ISO 27001 is an information security standard. The management of our customers’ information, as well as our own, is a critical part of our business. A managed...
information environment provides us with the tools we need to protect information assets.

These standards are important elements in company’s intranet and daily management procedure, guiding all employees to follow the standards to ensure high quality in all business projects. From current study we can see that Sigma Kudos continuously striving use IT technology to maintain the quality and improve service to customers.

5.2 Information Management Practices
For Information Logistics Company such as Sigma Kudos, how to manage information and produce information as a product is one of the most important task. It is also our data analysis’s most important part.

The information management life cycle as we described before could be used to any business process and cooperates with other information management method such as Sigma Kudos’s SPI method properly.

As we described before, the SPI method should be implemented in six different steps, where everything should be possible to present step-by-step to, among other things, support the credibility of the analysis result.

Here we discovered that if we map the 6 steps into Information Management Life Cycle. It will be like this as shows in the table:

<table>
<thead>
<tr>
<th>Sigma Kudos’s SPI Method</th>
<th>Information Management Life Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define the purpose</td>
<td>Sensing Information</td>
</tr>
<tr>
<td>2. Gather data</td>
<td>Collecting Information</td>
</tr>
<tr>
<td>3. Summarise the current situation</td>
<td>Organizing Information</td>
</tr>
<tr>
<td>4. Analyze the situation</td>
<td>Processing Information</td>
</tr>
<tr>
<td>5. Prepare a solution proposal</td>
<td>Maintaining Information</td>
</tr>
<tr>
<td>6. Report</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Mapping SPI to Information Management Life Cycle

We could see from the table that Sigma Kudos’s SPI method has a quite good match with Information Management Life Cycle which mentioned in Marchand’s Information Orientation Theory.

We will use one project which carried on by Sigma Kudos and three others not in details to analyze Sigma Kudos’s Information Management Life Cycle: the SPI method. From the study of these projects, we could have an overview about Sigma Kudos’s Information Management Practices.
Due to business confidential reasons, we could not describe every project in details; we will just describe Sigma Kudos’s performance and activities during the Information Management Life Cycle: SPI method.

The first project is designing information management systems for manufacturers of cookers:

![Manufacturers of cooker (Sigma Kudos, 2005)](image)

The following are the requirements from these manufacturers:

“We want to improve our information management. We would like to provide manuals that are adapted to the target groups and products. Today we have a manual for each product variant, but we must cut and paste between them as the same information is reused.”

5.2.1 Sensing Information: Define the Purpose
Before the project, Sigma Kudos indentifies the business strategy and vision, for this project, the strategy and vision could be: serving the customer with the best solution, like always. This is quite important and we think some of the information could have effects on business strategy and vision. In such situation, we need to sense the
information and make reformation of the business strategy and vision according to the information.

Actually, Sensing information is very important when the customers could not give you clear requirements. Sigma Kudos needs to identify the requirements from the customers as we described above.

From the requirements, we know that we need to do all of the Analysis: Information Analysis and System Analysis, but not too much Process Analysis.

Then Sigma Kudos needs to identify the problems:

The same information is in several information products. The target group is not clearly classified and target group may read about matters that do not concern him/her. Unique information products and could not manage information properly and finally produce manuals for the target groups.

5.2.2 Collecting Information: Gather Data
This part requires good methods of collecting information. In this case, the Interview and Questionnaire are used to collect data.

The collected data includes cooker manufacturers’ information; products information includes the repeated information, classified target groups such as customers, installers and maintenance people;

One of the most important things is using the latest technology and creative mind if possible. In this case, Sigma Kudos used modularized information management method which modules the traditional document system and promotes great efficiency.

The benefits from modularization as:

- The time it takes to create a new information product can be reduced by approximately 20% by reusing existing models that have not changed.
- The cost to manage the information can be reduced by approximately 20% when all information is managed centrally.
- The quality (from a user perspective) of the information increases as the user only receives relevant information.

But we shall consider about the additional cost with modularization:

- The initial cost of analysis, development and implementation as there is no ready system that can just be “installed”.
- Training of users. To work with modules requires a new way of thinking.
- Conversion of existing information (in the form of documents) into modules.
- Maintenance and administration.
For the new technologies we will use:

- SGML/XML
- Database with support for reuse, fragmentation, version management etc, for example, Astoria.
- Editors that support SGML/XML, for example, Xmetal.
- Additional functions that make automatic processing of information possible.

The new technologies and creative mind could greatly promote efficiency when manage the information.

In this step, filtering data is an important thing to notice. Filtering data needs lots of work such as getting the right information from the complicated situations etc. We will discuss about this in Discussion part.

5.2.3 Organizing Information: Summarize the Current Situation

This part will organize the data we have collected in the previous step. The current situations are divided into three parts: Information Analysis, System Analysis and Process Analysis.

Information Analysis will indentify the target groups and information types. Current situation at the company is a challenge:
• Information types and target groups need to be built from the ground up.
• Requires a full information and user analysis.
• Possibility for us to help the company avoid the most common mistakes in CPI (Customer Product Information) management.

Process Analysis will base on the company’s existing process to do a more detailed analysis. Most important part is to define triggers and interfaces to existing or developed processes.

Currently there is no established system for handling customers’ documentation. System Analysis will help the company to set up system to manage the documentations.

5.2.4 Processing Information: Analysis the Situation

Using the data collected before, we need to analysis the current situation in three different ways:

1) Information Analysis: Based on the Product Variants, we need to figure out:
   • Who are the target groups? Customers, Installers, Maintenance Persons.
   • Which parts are to be handled information is required?
What information do the target groups need?
What are the information types? Interface Description, Product disposal/handling instructions, Spare part list, installation manual, Configuration management guide, Product/system description, User manual, Safety instructions / legal notes;
These questions are needed to be answered in the analysis part.

2) System Analysis:
Following is the system which is designed by Sigma Kudos for the company:
Currently there is no established system for handling customer documentation. Tool used for content creation is MS Word. Documentation management and revision control in Rational ClearCase (but also something in project folders) Publishing as PDFs.

Considerations for the company:
- Immediate needs vs. long-term plans for the system
- Requirements for documentation management system (structured information, versioning, IDs, revision control, approvals, publishing)
- What are the common requirements for the main business areas? Possibility to use the same tools in different ways.
- Graphics creation
- Possibility for parallel publishing using standardized formats
- Multilingual support

3) Process Analysis:
The company’s previous process framework is a good starting point for a more detailed analysis.
Most important part is to define triggers and interfaces to existing or developed the company’s processes.

The new process designed for the company shows as below:

![Figure 14 Process Analysis for the company (Sigma Kudos, 2005)](image)

In this process, “New product will be developed” and “Coordinator plans the project” will be produced by Content creator. Administrator will review the content by “allocate resources needed” and “information analysis”. Finally the technical editor will “produce” and “distribute” all the required documents to the target group.

5.2.5 Maintaining Information: Prepare Solution Proposal and Make Report
Maintain information includes lots of activities after the processing.

1) Getting output from the processing: we have already done the SPI analysis and it is time to get output such as documents for the target groups. In this case, we produce different concerted information for Customers, Installers, Maintenance Persons.

2) Updating the information database: The Life Cycle for Information Management could not come to an end if new requirements or information need to be treating with. In this case, the cycle comes to an end till then.

3) Reusing information: Due to high expense of creating and maintaining information, we need to think about reusing the information and solutions if possible. This success case could be copied to other situation if possible.

5.2.6 Three Other Projects
The three projects are chosen from several cases that represent typical medium size companies. Due to Sigma Kudos’s respect to their customer, it is not allowed to show the names of the company.

This three projects carried out by Sigma Kudos used the same SPI method to achieve their business goals.

1) First Project
The customer is one of the world’s leading companies within the process and packaging industry, delivering equipment all over the world and conducting business in worldwide. The company has a central methods and tools unit that gives support to all product development sites.

The challenge in this work was to create a common way of procedure with product information within the company, where previously different sites had different rules and procedures.

**Sigma Kudos Role and Responsibility**
Due to Sigma Kudos experience of information management and a long established relationship working with the customer's product information, Sigma Kudos was selected to manage some parts of the company's central support work. The responsibilities were to:

- Create and maintain templates with customer-unique and customer-specific functionality for product information
- Update and improve the guidelines governing product information development and management
- Create and update product information production procedures
- Staff a central support function, handling problems related to product information production
- Educate the company's personnel in how to produce product information according to the company standards

**Result**
Due to the work performed in the central methods and tools group, the customer has one common way of working with product information. The company has common templates, working guidelines, training, and provides internal support for personnel. This gives the company control over its product information, and provides better quality and more consistent information to the final users.

2) Second Project
The customer is one of the world’s leading companies within the process and packaging industry, delivering equipment all over the world and conducting business in worldwide. The company has a central training department responsible for all product training for personnel and service technicians. Traditionally, all training has been instructor led, and generated high costs for the company.

Sigma Kudos got the opportunity to develop a new concept for training service technicians and other staff at a company in the packaging industry. The customer had no experience from developing e-learning content, but only a rudimentary learning management system (LMS) which was to be used.

**Sigma Kudos Role and Responsibility**
Sigma Kudos put together a team of experts with in-depth knowledge in various aspects of the problem:
- In-depth knowledge of the customer and the packaging industry
- In-depth knowledge of training and assessments
- A media production team which developed proof of concepts.
- SCORM (Sharable Content Object Reference Model) expertise

**Result**

Sigma Kudos developed a SCORM based, very cost effective concept with good possibilities for reuse of content, both from existing (instructor led course), but also reuse between various e-learning courses.

Sigma Kudos also developed a proof of concept course based upon the concept, with full functionality, SCORM and assessment for the course content.

The customer appreciated Sigma Kudos’ solution, and gave a go-ahead to develop final versions of the courses for use in the training of all staff.

3) Third Project

The company is a world-leading supplier in telecommunications Worldwide; Sigma Kudos is the biggest supplier to the company in Customer Product Information (CPI) development. Sigma Kudos Hungary has been providing managed services for the company since 2003. Services include content development, online library building, software and hardware documentation.

In early 2009 the company decided to transfer the Operations Support System - Radio and Core (OSS-RC) development from other subcompany in Sweden to Budapest, Hungary. The transfer involved approx. 160 designers, and a very short transfer period of 6-8 months. Hungary company decided to outsource the full responsibility of CPI development to Sigma Kudos. Sigma Kudos were assigned to evaluate the transfer activities, take over all CPI tasks for the whole OSS-RC area, and set up the new processes in Hungary.

**Sigma Kudos Role and Responsibility**

Sigma Kudos was assigned to handle all aspects of the transfer, within the shortest possible leading time, shorter than the design transfer itself. Responsibilities included:
- Analyzing the current CPI processes, tasks, workload, prepare the transfer plan
- Developing guides and checklists for the transfer
- Managing and staff the onsite transfer activities
- Securing fast development of new product knowledge
- Coordinating information, establish new ways of working and reporting practices, including own wiki pages to support design teams with information
- Completing the full transfer within four months
Result
By outsourcing the full CPI responsibilities to Sigma Kudos, the company was able to focus on its core design transfer activities. Sigma Kudos has used its own project management tool and transfer methodology for the transfer, with special focus on fast and effective product competence development.

Sigma Kudos provided the company a detailed analysis of the processes and information, organized and staffed the transfer, established transparent and multi-functional reporting practices, improved ways of working, and established means of smooth information flow within the company design areas, to support other areas of the transfer.

Sigma Kudos’ experience and quick adaptation to the complex demands greatly contributed to the success of this huge transfer, one of the biggest within the company globally.

5.3 Information Behaviors and Values
Due to short time internship in the company, I could not find the written format document about policy of information behaviors and values that guide the employee’s behaviors, so I could not analysis Sigma Kudos by the six different characteristics described by Marchand.

Anyhow, Sigma Kudos follows some international quality standards and has its own Management System Policy. The objective of the policy for the company is to become a leading global supplier of information services, deliver best-in-class services, solutions and quality to customers.

Sigma Kudos tries to fulfill the commitments by:
- Delivering services and solutions of the highest quality, meeting or exceeding customers’ expectations through operational and co-operational excellence.
- Protecting the information assets of both customers and Sigma Kudos.
- Contributing to a sustainable environment by complying with current legislative and other demands, promoting a more efficient use of resources, and pollution prevention within business group.
- Striving for continuous improvement of services and operations by increasing efficiency, stimulating profitability and managing growth.

This policy is long-term, and re-evaluated by management once a year. We believe every employee in Sigma Kudos is trying to follow these policies.

5.4 Conclusion
Applying well established Marchand’s Information Orientation theory, by using the case-study methodology, to Sigma Kudos in such a deep analysis could help us to improve understanding of both theory and practical application.
The analysis we have done in this chapter shows that Marchand’s theory can be well adapted to Sigma Kudos. The analysis also shows that Sigma Kudos processes excellent Information Orientation Capabilities as described in the theory:

- Sigma Kudos could effectively manage IT applications and infrastructure to support their business operations and processes, but need to improve IT for innovation support;
- Sigma Kudos could effectively manage information over the life cycle of information use by using SPI analysis method;
- Sigma Kudos could promote behaviors and values in information use, but need to form an information policy or information culture.
Chapter 6. Discussion

From the study of analyzing Marchand’s Information Orientation theory to Sigma Kudos and from all the materials we collected from Sigma Kudos and the interviews with Niklas Malmros, we find out some interesting aspects are needed to consider about for Information Product Companies. All these topics are based on the research of data analysis part, based on all the materials we have collected, and based on all the literatures what we have searched for. These topics are shows as below:

6.1 Using Marchand’s Information Orientation Theory to Manage All Kinds of Information

From the introduction part and academic study we know that Market Orientation, Customer Orientation, Competitor Orientation are nowadays important for every company. From the study of Sigma Kudos in the Information Management Life Cycle project and based on all the literatures we have been studied, we think it will be a good solution that companies converge and organize all kinds of information together, integrate resource and vision/strategy to the Information Orientation Theory as they are also the key areas that have an effective impact to a company’s business performance. Then an Information Orientation Management concept is proposed. This concept might help us understand more about Marchand’s theory. It means organizing all kinds of information, using company’s existing business processes, vision and strategy, resources to carry on business.

The figure below shows the structure of Information Orientation Management:

![Image of Information Orientation Management](image-15.png)

**Figure 15 Information Orientation Management**

For every business project, it is necessary that company organize all the information, categorize selected information into Customer Information, Market Information, Competitor Information and Product Information. These information shall be
distributed to corresponding responsible department/unit and will be processed by the
right functional experts together with company management and they could use
processes and resources with their understanding of strategy and vision for decisions
making and carrying on the project.

In our suggestion, the concept the information orientation management shall be
applied to all key areas that have an effective impact to a company business
performance, such as integrating customer information, market information,
competitor information and product development information etc. This concept also
encourages that information orientation management shall be applied to all company’s
existing key business processes and important projects.

6.2 Getting and Serving Information Everywhere
Running business is like exploring new land. Information products companies, such
as Sigma Kudos, nowadays always need to satisfy customer’s new requirements and
expand new markets. From the document and interview, we know that Sigma Kudos
opened the China’s subcompany in 2006. They were forced to do this, because the
sensed information said that their customers opened their sub-company in China quite
early. Obviously for more convenient communication, Sigma Kudos needs to open
sub-company in China too. Actually, it was thought that there might be big risk and
challenge to open an unknown market, because Sigma Kudos had no idea about China
before except know that it is a Communist State. But at that time, they didn’t want to
lose the customers. After comprehensive information analysis and discussion, the
decision was made to open a sub-company in China. The result proves that the choice
to serve information in an unknown market was right.

It was a good practice and experience for Sigma Kudos to have a try and explore new
market to get more customers based on a good preparation.

6.3 Classify Your Customers
Sigma Kudos is a company that produce information, in other words, they deliver
information as a product. They need to know the target group’s (customers) demand
also the target group’s skill level. The information need to be created in different
propose and to different target groups.

“In the beginning, you have a lot of information that you need in the process, this
information includes different kinds of information. At the same time, you also have a
lot of information inside the company. You need to organize all of the information
based on your customer’s needs, which means classify your customers and satisfy
your customers with your different information product.” said Niklas Malmros.

In serving information, you should know your customers, your competitors and your
information which you obtained. They have effect to each other, and the networks are
complicated. Information Product Companies need to distribute information through
these networks and get information through these networks, and sensing the impact from the network. Of course, the companies could also influence the others by the networks, leading the trend and guiding the followers. In that case, the company is capable to proactively use the information.

6.4 Filtering Information
As we discussed about information’s characteristics, too much information puzzled our eyes. It will take a lot of time to filter the information and find out what we really want. One of the topic we discussed in the interview is how to filter information. When Sigma Kudos’s employees face too much documents that from the clients, they need to filter these information, find out the information that the customers need. This is a time consuming task, but from this process, we could see the company’s capability of handling information.

It is also necessary to identify the source of the information when we filter information to make correct decisions. In other words, the right information could be confirmed by several sources but the wrong information just fool the people who is in the wrong way in the beginning.

6.5 Reusing Information
During the interview, Niklas Malmros mentioned about reusing information several times. Information is a special product that has characteristics of common product, but has its own characteristics:

First, information is costly to produce, but cheap to reproduce (Varian and Shapiro, 1998). During the interview, Niklas Malmros emphasized more than once that the company should think about reusing the information than create new information in the Maintaining information process. The cost of producing the first copy of the document is very high, but the cost of producing additional copies is quite low. This means that information goods should be priced in line with consumer value and not production costs. Thus, as Varian and Shapiro have pointed out, 'cost-based pricing' just does not work with information. Companies must use 'value-based pricing (which) leads naturally to differential pricing' (Varian and Shapiro 1998). While not all companies will explicitly charge for information that they provide to customers, understanding how information is valued from a user or consumer perspective is critical to competing with information.

Second, economists treat information as an 'experience good': that is, users or consumers must experience information to value it (Varian and Shapiro 1998). Information companies use brand image, reputation, and browsing as ways of getting people to sample or purchase information before they know exactly what they are getting.
Third, an abundance of 'potential information' or data is available to businesses and consumers today, especially over the Internet. So the real value of information management is in appropriately identifying and targeting the information that the customer or organizational member needs. Niklas Malmros also emphasize more than once that identify the target customers’ need is important for the information company.

Fourth, the ubiquitous use of IT infrastructure today has increased exponentially the capabilities to 'manipulate data' or potential information and to leverage 'network effects' (Varian and Shapiro 1998). Network effects exist, since, as the base of users on the Internet or IT networks in general grows, the potential value of networks to all users grows as well. Moreover, as the technology for manipulating potential information increases with new capabilities such as intelligent agents, push tools, and expert search engines, the diffusion or spread of these IT capabilities means that all industries and companies will be affected by these new ways of using and managing information over time. So, identifying and creating the right information asymmetries is critical to Information Company in the future.

From these supports, we could know that reusing information is quite important for Information Product Companies and it is a good way for the company produce information with efficiency.

6.6 Cooperate With Other Companies
As described in introducing Sigma Kudos part, we could see that Sigma Kudos catches any opportunities to find cooperation projects with universities and other companies. It is a good way to gain knowledge and expand market.

This is a win-win situation, benefits the university: students have more opportunities to practice what they have learnt in university and it will be good for them to find an interesting learning area and get a good job, and also benefits the company: get new ideas and theories from university’s further and new research, hire good employee after knowing them and no worries about lack of talented people.

This is a good way to put influences to the university, society. If companies want to enlarge its impact and expand its brand, it is an efficient way to cooperate with university and using other companies’ network which in the other way enlarge company’s market and network.

6.7 Using Current System to Most
The current system will continue to be used as they contain much of the necessary information and processing functionality even if the long-term plan is going to replace existing systems and databases.
During the interview, I notice that when Sigma Kudos using SPI to help companies to do system analysis, they always analyze and penetrate the current situation, only if the current system could not solve the problem which shall be solved, they will help the customer to achieve a better, more effective, modern and or usable technical system solution than the existing one. A system analysis also been made in the cases where a decision has been made to introduce a new system or new functions.

People are used to current system and the change to new systems may require a long time for users to adapt and also take a long time to use it efficiently. And if it is possible, the interface of the current systems should be kept as before if users satisfied about the current system’s interface.

There are always some advantages of current systems, the company need to know these advantages and ask the new system developers to inherit these advantages.

Typically, there is a huge investment in systems, and in most sizeable organizations the cost of maintaining these can be as much as 70–80% of the annual expenditure on systems and technology. Nor can support and maintenance be abandoned. So, in planning the migration to a new system, it is important to obtain maximum value from current systems. Meanwhile, the provision of critical business information with the necessary quality attributes in an appropriate set of target databases should be the objective of any migration and must still be justified against the business need. This is likely to be a long, multi-step process of progression toward an elusive goal. (Ward & Peppard, 2002)

6.8 Read Culture Difference and Build Company’s Own Information Orientation Culture

It is hard to find out the information culture when I do the internship in Sigma Kudos. In the analyzing of Information Behaviors and Values in the theory, I could not find out related information in Sigma Kudos. During the interview, Niklas Malmros thought the theory divided the human’s behaviors in details and we could not find out any code of conduct describes about the behaviors. From the theory’s point of view, Sigma Kudos needs to build their Information Behaviors and Values which could guide employees’ values and behaviors towards information.

In the end of the first interview, we talked about the Information Orientation Culture. It is a large topic, and Niklas Malmros start the topic from Culture issue between China and Sweden. Sweden has a long history making physical products industry, the cost for employee is pretty high, But in China, it is not expensive to hire a people, no big cost even take longer time to solve the problem. So I think there is different in the way we look into the information in China compare to Europe, but it is really fast going to the same situation. We are in some way of different mode.
When we speak to the Chinese customers, they are more focus on the product, but here (in Sweden) we always start to discussion pretty early about how to maintain and how to continue with the product, how to make sure the product works for 20 years, how to maintain in their parts, there are a lot of issues in the construction phase. That means we need a lot more information. So we have some information historical (opinions), but soon it will be the same (attitude towards information).

6.9 Quality Assurance

From data analysis part, we know that Sigma Kudos follows information service quality standards such as ISO standards and management system policy to make sure their information service’s quality.

The Sigma Kudos Management System is ISO 9001:2000, ISO 14001:2004 and ISO 27001:2005 certified. These certificates are processing focus and commitment to delivering services of the highest quality.

At the heart of Sigma Kudos is quality management system, which is the key factor to managing processes. The management system is critical for developing and delivering quality services as well as satisfying the customers’ quality requirements, complying with regulations, or meeting environmental objectives.

Reaching these promising and commitments will enhance company’s competitive advantage:

- Delivering services and solutions of the highest quality, meeting or exceeding customers’ expectations through operational and co-operational excellence.
- Protecting the information assets of both customers and Sigma Kudos.
- Contributing to a sustainable environment by complying with current legislative and other demands, promoting a more efficient use of resources, and pollution prevention within our business group.
- Striving for continuous improvement of services and operations by increasing efficiency, stimulating profitability and managing growth.

From this we know that an information servicing company such as Sigma Kudos needs to follow quality standards and have their own information servicing policy. Different from the traditional companies, information servicing companies produce information. Because of information’s characteristics that difficult to see, difficult to measure and difficult to manage, it is quite necessary to follow global information quality standards or even on the leading position to set up the standards.

For the customers who do not know your company, and want to establish relationship, it is a good way to show which kind of global quality standards that you follows which make you have common understandings to each other, to show your products reliability and capability.
Chapter 7. Conclusion

7.1 Conclusion of the study
Marchand’s Information Orientation theory was developed based on extensive research efforts. Regarding “how does the interaction of people, information and technology affect business performance?” by surveying over thousands of senior management team members in nearly hundred companies operating in many countries. Therefore, the established Information Orientation Theory and its structured three Information Capabilities should supply a valuable guidance to a company to apply, in order to improve its business performance.

For the reason of gaining tacit knowledge and practical understanding about the theory and with the support from Niklas Malmros (Global Operation Manager at Sigma Kudos) to help Sigma Kudos to self-check and find out the lacks and problems that the theory requires, we carry on this study also aiming at finding out some interesting factors that information product companies need to consider about.

In this study, the Marchand’s Information Orientation Theory has been applied as the analysis structure to analyze Sigma Kudos information technology application system by using case study methodology. We mainly focused on the theory’s first two parts: Information Technology Practices and Information Management Practices. The study achieves mapping these two parts to Sigma Kudos in sufficient depth. Table 4 outlines the relationships between the guidelines from the theory, the fact of how company works and the topics or comments that we discussed in chapter 6.
<table>
<thead>
<tr>
<th>Guidelines From the Theory</th>
<th>Facts of How Sigma Kudos Works</th>
<th>The Topics/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theory part 1: Information Technology Practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT for Operational Support</td>
<td>DocFactory</td>
<td>Company need to have such system to support their employee’s ordinary work</td>
</tr>
<tr>
<td>IT for Business Process Support</td>
<td>SPI method and DocFactory</td>
<td>Company need to have such system to support their core business process</td>
</tr>
<tr>
<td>IT for Innovation Support</td>
<td>Not Found Such System</td>
<td>If possible, build such system</td>
</tr>
<tr>
<td>IT for Management Support</td>
<td>Intranet, Code of Conduct, ISO quality certification</td>
<td>Quality Assurance and other systems to support management</td>
</tr>
<tr>
<td><strong>Theory part 2: Information Management Practices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Management Life Cycle</td>
<td>Sensing Information</td>
<td>Define the Purpose</td>
</tr>
<tr>
<td>Collecting Information</td>
<td>Gather Data</td>
<td>Getting and Serving Information Everywhere; Cooperate with Other Companies</td>
</tr>
<tr>
<td>Organizing Information</td>
<td>Summaries the Current Situation</td>
<td>Using Current System to Most</td>
</tr>
<tr>
<td>Processing Information</td>
<td>Analyze the Situation</td>
<td>Using the Theory to Manage all Kinds of Information; Classify Customers;</td>
</tr>
<tr>
<td>Maintaining Information</td>
<td>Prepare a solution Proposal and Make Report</td>
<td>Filtering Information</td>
</tr>
<tr>
<td><strong>Theory part 3: Information Behaviors and Values</strong></td>
<td>Six Different Information Behaviors</td>
<td>Could not Find Information Culture in the Company</td>
</tr>
<tr>
<td>Could not Find Such System</td>
<td></td>
<td>Read Culture Difference and Build Company’s Own Information Culture</td>
</tr>
</tbody>
</table>

Table 4: Outline of the Relationship Between the Theory, the Fact of How Company Works and Some Comments
The current study answers the following given research questions:

1. How could we have more practical understanding about Marchand’s Information Orientation Theory?

We answer this question by applying Marchand’s Information Orientation theory to Sigma Kudos which is an information product company. Using Case-Study methodology, we investigate the Information Capabilities and the information management process in Sigma Kudos.

We have improved our practical understanding of Marchand’s Information Orientation theory and that Marchand’s Information Orientation theory and its entities can be used perfectly to exam and measure the information capability of Sigma Kudos. We also learnt how efficiently Sigma Kudos uses DocFactory to improve their employee’s working efficiency and uses their SPI method to sense, collect, organize, process and maintain the information that comes from market, customers, competitors etc. and all other aspects.

We also find out many interesting topics which information product companies need to consider about. These topics are our practical understanding about the theory. These topics enrich our knowledge and most of them are listed in “Discussions” part. These topics are also the answer for the second research question:

2. What could we learn from applying Marchand’s Information Orientation Theory to Sigma Kudos Company?

We have leant a lot from current study. We have improved understanding of the theory and its applicability to improve a company’s business performance. We have also learnt that the Sigma Kudos Company actually follows Marchand’s Information Orientation Theory very well in many aspects. This must be a nature characteristic of an information product company like Sigma Kudos.

During the study cooperating with participants form Sigma Kudos Company, some interesting topics have discussed and gathered for better understanding after the study.

Some of them are listed as following,
- Using Marchand’s Information Orientation Theory to Manage All Kinds of Information
- Getting and Serving Information Everywhere
- Classify Your Customers
- Filtering Information
- Reusing Information
- Cooperate With Other Companies
- Using Current System to Most
Read Culture Difference and Build Company’s Own Information Orientation Culture

Quality Assurance

In the discussion of the first topic, we find out it is the main finding from this study that companies could converge and organize all kinds of information together, integrate resource and vision/strategy to the Information Orientation Theory as they are also the key factors that have an effective impact to a company’s business performance.

7.2 Research Contribution
From the study we have conducted, this study has three mainly contributions:

Firstly, the current study contributes to the practical understanding about Marchand’s Information Orientation Theory. Marchand’s theory supplies a valuable guidance to how to apply information orientation theory to improve a company’s business performance. From this study, we know more about the theory and about Sigma Kudos. By applying the theory to Sigma Kudos, we find out many interesting aspects which information product companies need to consider about. So this study enriched our practical understanding of the theory.

Secondly, after applying Marchand’s Information Orientation Theory to Sigma Kudos, we find out the theory is a practically good guideline to Sigma Kudos as an information products company. By applying the theory to Sigma Kudos, we know Sigma Kudos’s DocFactory and SPI method are quite match to the first two part of Marchand’s Information Orientation Theory. The theory could help Sigma Kudos as well as other information product companies. From this point of view, we need to apply Marchand’s theory to more companies in future research.

Thirdly, we integrate resource and vision/strategy to the Information Orientation Theory as they are also the key factors that have an effective impact to a company’s business performance. During the process of applying the theory to Sigma Kudos, we find out some interesting aspects that are particular to Sigma Kudos. It provokes our attention and thinking. In the aim of finding these aspects out, we carry on such a research and finally we achieved this objective and proposed Information Orientation Management Concept as to improve the theory. In this concept, we suggest that companies converge and organize all kinds of information, integrate resource and vision/strategy to the Information Orientation Theory.

This study will benefit both academic knowledge to improve understanding of the Marchand’s Information Orientation Theory and business management practice.
7.3 Further Research

For the limitation of the research, we need to access more people who using information management systems in Sigma Kudos, not just senior manager. From these employees’ point of view and their understanding about the theory, this study’s contribution to the theory will be more convincible.

The findings from the study are also needed to be proved in more companies, so there is a topic that could be done in further study: Applying Marchand’s Information Orientation theory to more companies, not only information product companies.

Nowadays, Organizations invest a lot on combining all the existing systems together, hoping to gather the resources together to support the company’s core business project and to achieve improved better business performance. As we proposed a concept Information Orientation Management in the discussion part, the concept is an interesting topic which suggests the companies converge and organize all kinds of information together, integrate resource and vision/strategy to the Information Orientation Theory. This suggestion need to be proved in other people’s research and need to be more precise. It will be an interesting topic to do a further study.
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Appendix A. The First Interview Questions and Answers

Time: 10:00am-11:30am
Date: 13th of April, 2010
Place: Sigma Kudos Office, Växjö, Sweden.
Interviewee: Niklas Malmros
Position: Global Operation Manager at Sigma Kudos.

Question 1. What is your idea about Information and its influences to the company?
Answer: In some case when company just starts, the information is quite important. In other cases like business to business, or business to consumer, if you send information to end consumer, then you need to have information in another way, because you do not know the target group’s skills (which kind of information they need). So it largely depends on who is the target group and how important the information is. If you go to end customer for example, software user, they may be just use ten percent of the software, so it is important to understand the software and how to use it. In this case, the information becomes important.

Question 2: Which kind of information our company are looking for?
Answer: It could be a lot of different information, for example, design data, constructions, you have a lot of information from the beginning that you need in the process to later on do market information. You have a lot of information inside the company that needed to later on create information that’s going out. The information could be experiences, research etc. a lot of data. It depends on the road.

Question 3: What do you think about information in this information logistics company?
Answer: Our focus is Product Information. Of course, there are lots of other information like supporting information, specification…etc, a lot of information, Our goal is to take that part of process, to make the information for the end users.

There is a problem we facing today that many times, the users don’t want to use the information. Because when you writing documentation, you will face problems of massive data and the way you handling information, you writing long documents, but the users don’t want to have long documents, they prefer short information to solve something fast, and they used to search on Google from internet. Now we are switch from long documents to have smaller topics describing task or set of topics describing how to solve the problems.

Question 4: What is your idea about the Information technology Practices that change the way we work?
Answer: Yes, we need to write information in a new way in the future, and also look into different Medias. If we use E-learning or flash movie, then we will have the
problem with Maintenance, the maintenance of the information is much more expensive. So we have to find a cost efficient way at the same time.

Almost all the Swedish Companies they make some sort of product that is acting on global market. When acting on global market, you need to localize the information, such as China, France…etc. You have to think about language, then it will be more cheap to translate texts than rebuild E-learning etc. We are making so many tests about it now, how to deal with information in the future.

**Question 5: What do you think about information projects and how you start up a Project that handle information?**

**Answer:** We set up information project all the time. From our point of view, it is mainly about product information. There are some product tool, software what so ever, that shall be described for someone, and we are in some way part of that customers’ product development, because information is part of the product. So we are doing this job to deliver the information to specific customers. We have 350 persons sitting down and writing for the customers.

When you say about information project, you have a wide scope, internal information etc. We have our scope when we discuss information project. The information is part of the product. So when we deliver new product, properly 80% of the information could be reused, use the same business model.

We look into the process today, how the process creates information, how they do it today, then we look into the information, which information each type of users need, different groups. After that, we look into the structure of the information, as cost efficient as possible to maintain which information is possible to reuse. It is good to have single source, the things shall only be described once and then reuse. Of course it is not possible in the real world, but 70% of reuse. So it is some way based on some methods, and also experiences that how deep structure you should have and how small topics for different context.

It is the way we start, when we have done it, we look into the systems, to see what kind of systems you have today. Are they possible to use, or do you need to buy something new. So we look into process, information, and system based on users. That’s the way we start projects. After that we go to implementation face and so on.

**Question 6: Do we have some process or method to handle information?**

**Answer:** Yes, we have a method calls SPI, P is process, I is information and S is system. You start with process and information and then system requirement is the result from this two. So this is the way we start up when customers asking us what shall we do. And also show them the cost, they need to know how much they could save by this investment, also how could increase the quality and time to market.
Question 7: What do you think about Information Management Process in the way of Sensing, Collecting, Organizing, Processing and finally Maintaining Information?

Answer: I think this is the general process of information management. Most of the companies they know what kind of information they need, if you could not organize the information, you could not find it. We have lot of people that are writing, perhaps half of the time is about collecting information and organize it. If you write something, you must know whether the information is applicable? Who will use it? In which context it will be reused? So you must organize it. Then you will be able to generate the information need in that situation.

Processing information is using our Docfactory to create documents. It is in some way, filtering information, if you have total amount of information, based on my situation, I only want to have the information I need, so the processing is in some way taking away a lot of information that I don’t need right now.

For measuring information, if you have made a huge production with a lot of information, you could measuring how many copies there are, if you have a website, you can measuring which information is used, if there is information parts which never been used, then probably you should not write them. The measuring information is at the edge of what we can do today. I think you can ask Prof. Welf Löwe in your university, we are doing a project together about: Quality in information systems. It is about measuring information quality. He could show you how we measure information, then you have some examples. He has made some studies about how to measure quality in Programming and we thought the theory could be used on measuring information.

The maintaining information is using a cost efficient way to maintain information. We need to use new technologies, but we need to use it smart.

Question 8: What is your idea about Information Orientation Culture difference?

Answer: Yes, I think it is also a Culture issue between China compare to European for example. Sweden has a long history making physical products industry, the cost for employee is pretty high, then from quite beginning, you have to think about life cycle cost, to be able to have a low cost. You need a lot of information to instruct people how to do with maintain the things, In most part of Europe you have pretty high employee cost. But in China, it is not expensive to hire a people, no big cost even take longer time to solve the problem. So I think there is different in the way we look into the information in China compare to Europe, but it is really fast going to the same situation. We are in some way of different mode. When we speak to the Chinese customers, they are more focus on the product, but here (in Sweden) we always start to discussion pretty early about how to maintain and how to continue with the product, how to make sure the product works for 20 years, how to maintain in their parts, there
are a lot of issues in the construction phase. That means we need a lot more information. So we have some information historical (opinions), but soon it will be the same (attitude towards information).
Appendix B. The Second Interview Questions and Answers

Time: 8:10am-10:00am
Date: 30th of April, 2010
Place: Sigma Kudos Office, Växjö, Sweden.
Attended People: Tobias Andersson, Niklas Malmros, Yuan Ke
Position: Global Operation Manager at Sigma Kudos.

Question 1: What do you think about the Information Technology Practices that changes and supports the company?
Answer: I agree with those bullets, those are kinds of measurements for the information orientation company. But you can not sure those situations will give you information orientation. The main target is to have understandable context, all the things could be possible, and you also have the quality in the content.

Question 2: What do you think about the Information Behaviors and Values?
Answer: I agree with those behaviors and rules which are also could be seen as kind of company culture, information culture. Ask people share information with more communication. This is quite important in measuring company’s information capability I think. Employees always need some rules to follow and the whole company could form a nice environment, a good information sharing culture.

Question 3: What do you think about the Marchand’s Information Orientation Theory?
Answer: I think this theory is very nice, it talks about three information capabilities, and it’s time to combine them together, but it is hard to make (in the real situation) it so clear, and everything is integrated into each other in some way. All the things make it possible Information Orientated, but it doesn’t mean it becomes Information Orientated. It is more culture in the company. The context is missing here. I see those three parts describe all necessary interesting aspects to read information orientation. You should also have some kind of process on the top of the three parts, this combination should works together.

When we discuss information, we always define the target groups. If you don’t know anything about target groups, you cannot write anything. Target groups have different background, you must consider about communication and people you are writing to. If you write information, inside company or outside company, it is not information until users understand it, before that, it is just data. So you have to classify the customers, writing for different groups. If you turn around and look at the people who consume information, that’s where value appears. So to be able to have information value, you must understand your target groups. There is always some context when you write information.

Question 5: What is your idea of SPI?
Answer: SPI is the way to solve problem, it is the process about analysis that how to build system, how to handle different things (information), how to carry out processes etc. In the context that everything is about how to create information, SPI is the tool to do it. We use the SPI analysis method and make great successes in every business goals. All these successes explain the SPI Analysis Method is one of the Information Capabilities.