

# INVESTIGATING BUSINESS INFORMATION MANAGEMENT PRACTICES IN LARGE FINNISH COMPANIES

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## **Abstract**

Traditionally, information systems and processes in companies have focused on selected information within a certain context. However, what decision maker's need is a comprehensive set of up-to-date information on various contexts. Information on both internal and external sources is important in order to enable sophisticated decision-making.

In a time of fast change and intense competition, companies aiming to succeed in this demanding business environment are restlessly seeking effective business information management practices. Term Business Intelligence (BI) refers to business information management processes and systems and the business knowledge itself, although the terminology is far from consistent; other terms instead of Business Intelligence are also used. Besides, in the real world Business Intelligence is often used to refer to both the information technology based systems and the actual business information management processes.

In this study, the business information management practices of large Finnish companies are explored. The aim is to find out – to mention a few topics – what terminology is used, how Business Intelligence functions are organized and how important this area is seen for the future competitiveness.

The top 50 Finnish companies were interviewed by telephone in July 2002. The sampling plan of the study required that the business intelligence experts representing the top 50 companies in Finland answer a multi-page questionnaire. An expert interviewer navigated the respondents through the questionnaire, and assisted when found necessary.

In the paper, the research process is described and the main results of the study are presented. In addition, conclusions based on the results are withdrawn to contribute to the research and development of business information management, and to set guidelines for further academic research of this emerging topic.

**Keywords**

Business Intelligence, Business Information Management, Information

**INTRODUCTION****Background for research**

The Business Intelligence (BI) concept is understood as organized and systematic processes by which firms acquire, analyze and disseminate information significant to their business activities. With the help of Business Intelligence, companies learn to anticipate the actions of their customers and competitors as well as different phenomena and trends of their market-areas and fields of activity. Companies then use the information among other things to support their strategic and operative decision-making. The most common conversion of the term Business Intelligence in the Finnish terminology is “market- and competitor monitoring”. This research has applied the notion of “business information acquisition and analysis”.

Current literature on Business Intelligence has been fairly sketchy and theoretical. There has not been a generally agreed conception of Business Intelligence but, rather, each author has promoted his or her own idea of its connotations.

In recent years, Business Intelligence operations have significantly increased in Finnish companies. There are currently several different firms offering Business Intelligence consultancy or Business Intelligence system development. Business Intelligence terms and practices have not yet become very well established, however, and several different terms are employed for this concept. Most firms think of Business Intelligence operations as a process focusing on monitoring the competitive environment around them. However, the concept is often confusing as it is in some cases applied to technological information management solutions for companies' internal information.

This research has applied surveying as its research method. Individuals responsible for Business Intelligence operations in the top 50 Finnish companies by sales revenue (according to Talouselämä Top 500 list) were telephone-interviewed. The interviewees were sent cover letters and questionnaires in advance while the interviews, attracting a total of 46 participants, took place between 11.6. -3.7.2002. The return rate reached 92 percent forming a sound basis for the study. Four companies refused an answer appealing to trade secrecy or busy schedules.

**Research objectives**

Business Intelligence activities have recently become much more common in Finland. There have not been studies researching Business Intelligence from a practical viewpoint in this country and, therefore, the objective of this study was to find out how common the Business Intelligence activities are and how Business Intelligence is currently being applied in large Finnish companies. The study examines the initiation and organization of Business Intelligence activities as well as the future prospects concerning Business Intelligence in the interviewed companies. The research will also examine key areas of improvement in Business

Intelligence operations, benefits gained from Business Intelligence as well as the future outlook for the field.

## **RESEARCH FRAMEWORK**

### **Changing business environment**

In planning their strategy, companies need to consider the pressures and challenges set by the external business environment in order to thrive in the global digital economy. A rapidly changing business environment brings about a growing need for very timely, first-rate business information. In addition, the amount of information available is increasing along with advancements in information and communications technologies. It may be very difficult to recognize the relevant pieces from such an overload of information. Yet, the competitive edge is only gained through the ability to anticipate the information, to craft it into intelligence relevant to the business environment, and to actually utilize the skills gained from it. Lahtela et al. (1998, p. 4) define competitiveness as the company's ability to successfully operate in changing circumstances.

### **Management and decision-making**

Management is most often a collaborative effort, involving several people with distinct expertise from different organizational levels. Managerial input, therefore, is particularly crucial in bringing together contributions from a diversity of fields and knowledge bases.

According to Räsänen (2000, 17), business success is dependent upon three factors. A company must be able to satisfy its core business agenda and, secondly, to form out of the agenda a product entity that is successful among the customers. The third factor is the external business environment. Management needs to predict any changes and make decisions based upon flawless real-time information. Forrester (Yrjö-Koskinen 1973, 1) has put forward a definition by which management is in fact about transferring information into decisions. Sydänmaanlakka (2001, 171) emphasizes that information in itself is not as significant, as is the fact that the information is meaningful and that it is being utilized in practice, which then calls for appropriate management of the information.

Information needs can be either explicitly recognized or they may be unconscious. Expressing information needs comprehensively is very challenging - at times impossible. Therefore, those responsible for acquiring the information should not confine their search only to information specifically defined and pre-ordered.

Although Business Intelligence has become a trend-like phenomenon, it is not that new as a concept or term. Already in the 1980's Tyson (1986, 9) identified the term and emphasized the need for continuous monitoring of customers, competitors, suppliers and other fields. According to Tyson, Business Intelligence comprises of a variety of information:

- Customer Intelligence
- Competitor Intelligence
- Market Intelligence

- Technological Intelligence
- Product Intelligence
- Environmental Intelligence

Viva Business Intelligence Oy (1998, 5) has defined Business Intelligence as a continuous and systematic process, which produces knowledge, insights and forecasts on a company's operating environment. Effective Business Intelligence then increases the quality of strategic and operative planning and reduces the time used for decision-making processes.

## MAIN RESULTS

Companies interviewed for this study were chosen from the Talouselämä 500 list of companies in Finland. The actual interviewees from the companies were mainly individuals in charge of Business Intelligence operations. The research itself is static in its disposition. The objective was to map out the situation prevailing at the specific point in time when conducting the research. The companies were categorized according to their industry: *manufacturing, trade and services, and information and communication technology (ICT)*.

### **Systematic business information acquisition and analysis**

80 percent of the companies interviewed have systematically organized Business Intelligence operations. All of the ICT firms included in the study report a systematic way of collecting business information. When comparing industries, the trade and services sector had the most companies with no systematic business information acquisition and analysis. It should be noted, however that also in the trade and services sector three quarters of the companies do have systematic activities in the field.

### **Which term is being used for business information acquisition and analysis?**

61 percent of the interviewed companies place business information acquisition and analysis under the heading of Business Intelligence, Competitive Intelligence or Market Intelligence. 48 percent of all interviewed companies apply the term Business Intelligence. In addition, 11 percent are considering relabeling the concept as Business Intelligence in the near future. 16 percent of the companies have initially named the concept as Competitive Intelligence, but in these firms the term has been changed into Business Intelligence in the past three years. Business Intelligence activities have previously been referred to as either Market Intelligence, Information Services or Market Research in 11 percent of the companies.

The terms applied often relate to the type of information being gathered and analyzed. In general, Business Intelligence can be considered an umbrella term for a wider sector of activities in many companies. Business Intelligence term appears to be the most popular term for business information acquisition and analysis. Results of the survey that this term will become even more common in the future. On the other hand, terms in this field can still be seen partly just as vague in the business world as they are in the literature.

### For how long have the activities been systematically organized?

92 percent of the companies surveyed have embarked on a systematic process of business information acquisition and analysis for more than three years ago. 38 percent have begun their activities for more than a decade ago. Eight percent of the companies have begun the operations within the last three years. (See Figure 1.) Overall, the companies have conducted business information acquisition and analysis activities for a fairly long period of time.

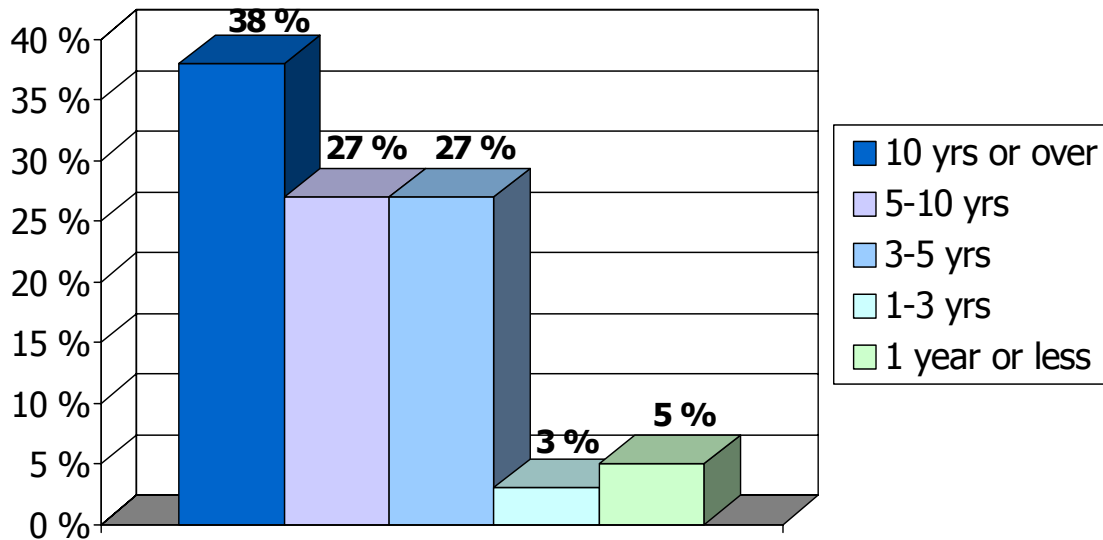


Figure 1. For how long have operations been systematically organized?

Companies in the trade and services sector have been conducting business information acquisition and analysis for the longest time. 94 percent of the companies in this sector have had such activities for the past three years or longer. 47 percent of companies in trade and services sector have begun business information acquisition and analysis over ten years ago. This percentage was 36 in manufacturing and 17 in information and communication technology sector.

### Why were the activities established?

Companies had the option of choosing reasons for starting the activities from eight given choices, or to name a reason themselves. One of the given options, 'active promotion by service providers', was not chosen by any of the interviewees. Hence, external application providers or consultants in the field did not have any particular role in initiating Business Intelligence activities in the companies.

81 percent of the companies have begun business information acquisition and analysis as they have realized a need for enhanced information to support their planning and decision-making. For 65 percent of the companies the driving force behind starting the operations has been a need to obtain intelligence about business environment and its development to support operative actions. Over half of the companies have embarked on the activities because it has become a prerequisite for maintaining their competitiveness. According to the replies received, the companies do not consider Business Intelligence to be a fad. Only five percent

indicated that the reason for them to embark on Business Intelligence activities was that Business Intelligence has become a trend in the business world.

Overall, the goal of starting activities for business information acquisition and analysis has mainly been to increase utilization and sharing of existing information resources in the companies.

### How significant are the benefits gained?

A scale on level of significance was used for this interview question. Levels included were *very significant*, *significant*, *fairly significant*, *not particularly significant* and *insignificant*. Generally, the companies felt that the most significant benefit provided by Business Intelligence activities was acquiring better quality information for decision-making and the improved ability to anticipate earlier any threats and opportunities. The companies could also include one option named by them to describe the most significant benefit of their Business Intelligence operations. This option was also chosen often by the companies. The least important benefit was chosen to be time- and cost-savings gained through the activities. (See Figure 2.)

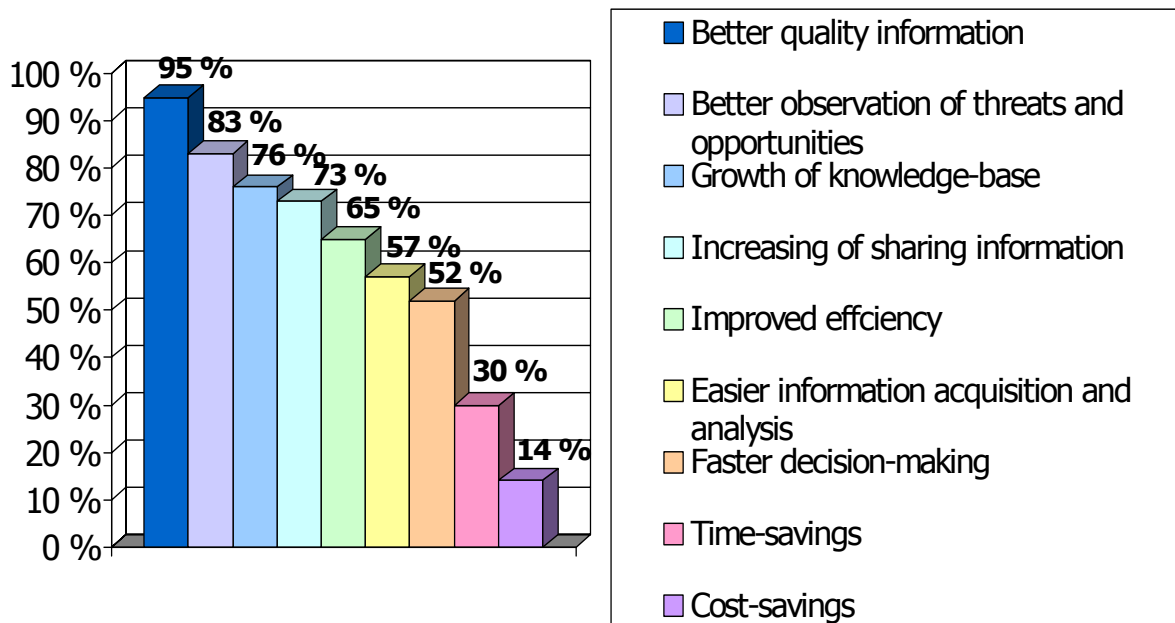


Figure 2. Benefits gained from operations.

95 percent of the companies named gaining better quality information for decision-making either as a very significant, or a significant benefit for their operations. Only a few companies, however, named only one reason for starting their Business Intelligence activities. Overall, there have been several reasons for each of the companies to begin their Business Intelligence activities. 46 percent of the companies consider acquiring better quality information as a very significant benefit. Obtaining early indications of any opportunities and threats was the second most important benefit, chosen by 32 percent of the interviewees. Other important benefits were improved sharing and dissemination of information within the organizations,

improved efficiency, faster decision-making and growth of a general organizational knowledge base.

Over third of the companies consider the saved time and easier acquisition and analysis of information as a fairly significant benefit gained from Business Intelligence activities. 59 percent of them consider cost-savings gained from Business Intelligence to be either insignificant or not particularly significant. The reason for this may be the fact that cost-saving benefits of Business Intelligence activities are long-term. Benefits gained are quite intangible, and therefore they are often difficult – even impossible – to measure.

### **Where is the information acquired?**

It is a normal prerequisite for a business to collect information from its own operations as well as from external sources. This interview question, however, targets only the information specifically acquired through Business Intelligence activities.

Companies acquire business information mainly from external operating environment or both the operating environment and their own business operations. 49 percent of the firms claim to collect information from both sources, and 46 percent of them merely acquire information from the external business environment. Hence, only five percent of the companies consider their own business the most significant source of information.

Customers and market research institutions are considered as the primary information sources. Other important sources are the media, competitors, investment analysts, journalists and subcontractors.

### **Which external sources of information are included in Business Intelligence activities?**

95 percent of the companies gather information about their competitors and their own field of business. Over 80 percent say they gather information about customers and general macro-trends. Other important subjects are customers' fields of business or those related to the customers. Also, legal information, technical specifications and country-specific information are considered significant. Interviewees themselves name the following as essential subjects for information gathering:

- Legal preparations by the European Union.
- The world market situation in different fields.
- Specific trends in the companies' own fields and prices of raw materials.

A near third considers information related to their suppliers and their fields as less important. Logistics is the least important subject of monitoring for the interviewed companies (24 percent).

### **Where are the operations set up?**

Slightly above one third (35 percent) of the companies have placed the operations regarding business information acquisition and analysis within the firm's business development unit. Other common units to place the operations were companies' marketing and strategic planning units.

### **Is there an appointed individual in charge of the operations?**

89 percent of companies have appointed at least one individual responsible for business information acquisition and analysis operations. 32 percent have a named Business Intelligence manager. In 14 percent of the companies, the individual responsible is the director of business development.

### **How many individuals are engaged with the operations?**

Business information acquisition and analysis operations employ an average of four full-time individuals in the companies. The number of full-time employees working in the operations varies from one to thirty. At eight percent of the companies there are more than ten full-time employees involved in the operations. 78 percent of the companies have one or more full-time employees involved. Overall and on average, the information and communications technology firms (67 percent) employ the most full-time employees for business information acquisition and analysis operations.

The companies have on average 12 part-time employees involved with the operations. Part-time employee means an individual responsible for other functions in the firm, but who also has responsibilities regarding business information acquisition and analysis activities. 30 percent of the companies have no part-time employees involved.

### **How significant are the various sources of information?**

The scale being used in this question is: *very significant, significant, fairly significant, not particularly significant* and *insignificant*. This question firstly deals with the companies' internal information, and then external information.

The companies consider their own personnel as the most important source of information for them. 76 percent feel that personnel are a significant or very significant source of information.

Reports prepared and written by the employees are very important. The term report means in this case information that cannot be acquired directly from information systems, but requires a follow-up and investigation by personnel. These reports include competitor profiles, news updates and field reviews. Over half of the companies name such reports as very significant or significant sources of information. According to the interviewees, issues and aspects that cannot be displayed as such on an intranet or other information systems can be expressed in reports. On the other hand, 60 percent consider information systems either as significant or fairly significant sources of information. Eleven percent of the interviewees name the management board or Information Services as very significant sources for information.

The most important external sources for information are competitors and customers, while the least significant external sources of information are considered to be universities, investors, suppliers or sub-contractors and public research institutes. Other very important external sources for information are market research institutes, the media and investment analysts. The interviewees name as significant external information sources the reports by the European Union, international information banks, industry associations, field-specific networks and information providers.

75 percent of the companies consider competitors very significant or significant sources for information. In practice, customers are nearly as important external information sources as competitors. 40 percent consider customers as very significant and 38 percent consider them significant.

Regarding this question, there prevails a certain inconsistency in the answers. This may be due to the disparities in the nature and fields of the companies interviewed. While 40 percent name journalists and sub-contractors as very significant external sources of information, 38 percent of them name them not particularly significant or even insignificant. 43 percent of the companies name consultants fairly significant sources of external information.

#### **Is there an allocated budget for the operations?**

62 percent of the companies have an allocated budget for the process of business information acquisition and analysis. If there is no such budget, the costs have usually been directed to the financial administration. With six percent of the companies the costs have been divided among different business units.

#### **Who utilizes the products of Business Intelligence?**

The top-level management utilizes the information and intelligence gained through business information acquisition and analysis in their work in 95 percent of the companies. Half of the companies name top management as the single most important user of the business information. Also, middle management and specialists are an important group of users in 85 percent of the companies. In addition, 14 percent name another user for the information, such as customers, sales and the development organization and communications units.

## **FUTURE**

#### **How will emphasis on the operations change in the next 5 years?**

One third of the companies believe that the emphasis on activities concerning business information acquisition and analysis will considerably increase in the next five years. 44 percent suspect that the emphasis on such activities will increase slightly. 20 percent believe the emphasis to remain as it is. Only two percent predict the emphasis to decrease slightly, and none of the interviewees believe the emphasis to decrease significantly. (See Figure 3.)

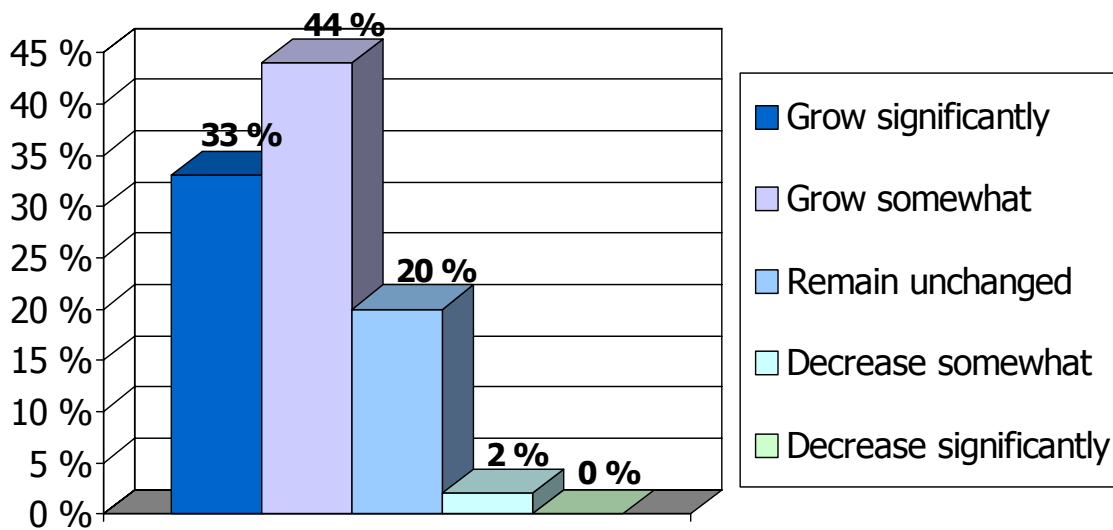


Figure 3. How is emphasis expected to change in the next five years?

Nearly 90 percent of companies, who do not have systematically organized processes for business information acquisition and analysis, presume that the emphasis will increase considerably or at least slightly in the future. Presumably, the activities will become more systematic within the companies as the emphasis on business information acquisition and analysis is increasing.

Naturally, companies who already have systematically organized operations do not believe to increase the emphasis in business information acquisition and analysis. On the other hand, 75 percent of these companies do expect the emphasis to grow significantly, or at least a little. Based on the results, companies who already acquire and analyze business information consider these operations important also in the future. It is also possible, however, that with some interviewed companies this is a sign of not having very mature techniques and methods or efficient information systems for the handling and utilization of information, and that investments are needed to improve this situation.

Only the companies, who have had operations for business information acquisition and analysis for more than ten years, consider investments towards these operations to decrease in the future.

### **Which are the targets for development in the operations?**

76 percent of the companies feel that crucial needs for information are not recognized at all or not well enough. Recognizing critical information needs is considered a significant area of improvement, mainly as the operations concerning business information acquisition and analysis is currently not systematic or comprehensive enough. Therefore, the most likely area of improvement will be recognizing critical needs for information. (See Figure 4.)

Another crucial (70 percent) issue of development in the companies is utilization of internal information. In addition, nearly half of the companies emphasize the diverse utilization of information to be critical for competitiveness. There may be a lack of suitable integrated

technologies and human resources and inefficiencies in information management and acquisition. These are also considered significant targets for development.

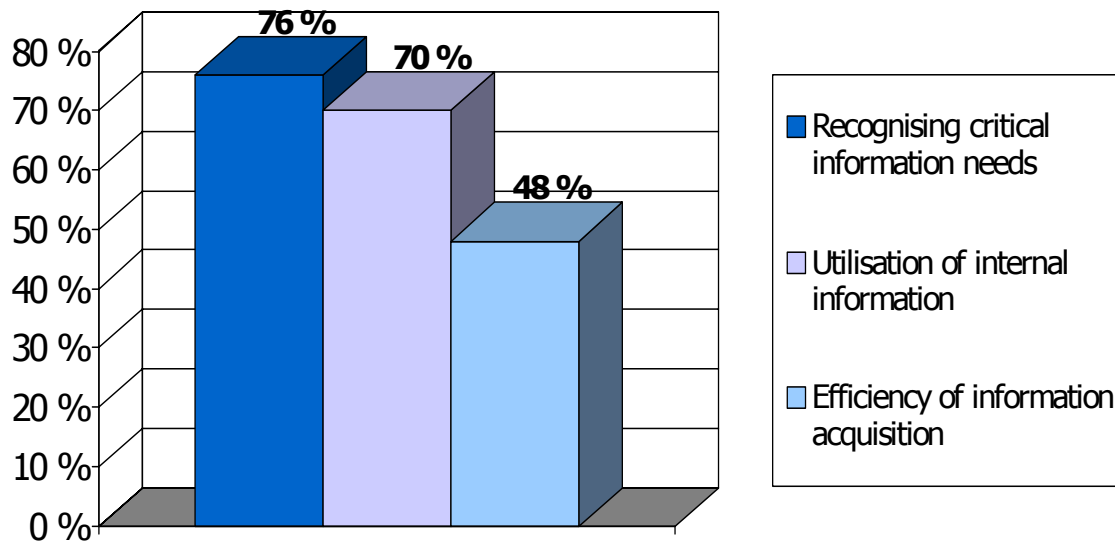


Figure 4. Most significant targets for development.

Recognizing needs for information is often felt to be demanding and difficult, as partly the needs are unconscious. Defining the needs for information is very important for companies, as without such effort there is no real purpose for any operations concerning business information acquiring and analysis.

Nearly 25 percent of the companies interviewed consider the extraction of meaningful information out of the external business environment as difficult. One third of the companies feel that there is already too much of this information. Due to the information overload, prioritizing is very demanding, the quality of information has decreased and narrowing the focus is increasingly important. 30 percent of the companies name finding the right sources for information as a problem.

15 percent of the companies name as their biggest problem the fact that there are competing and non-integrated information systems at use within the firm. This makes finding the right information virtually impossible. Ten percent consider having the information in a form that it can be manipulated and managed more easily a precondition for systematic utilization of information. According to nine percent, this could be achieved more easily by forming consistent products of the operations. After such effort, also measuring the operations would be much easier.

One of the companies' representatives points out that personnel will understand the benefits of Business Intelligence activities only after a wider implementation of the operations in the company. He continues that when there are no Business Intelligence operations, many opportunities are left unseen, as personnel do not understand well enough their own business

or field and the needs for any improvement. This requires the staff to be trained for understanding the meaning of Business Intelligence operations, so that they would be able to utilize information gained through their own work.

25 percent of the companies consider as one of the biggest obstacles for starting Business Intelligence operations the inflexible working manners of the personnel. Along with personnel, 15 percent consider the top management commitment to Business Intelligence as a significant target of improvement. The purpose of the operations needs to be justified as explicitly as possible to all personnel before embarking on the project. If staff is already over-employed, there will obviously be resistance to new ways of operating. Nearly 40 percent of the companies consider increasing human resources as a subject for development regarding Business Intelligence operations.

22 percent of the companies claim their Business Intelligence operations to be at their early stages, even if the projects have already been started several years ago. There appears to be a need for a more systematic approach, even if the basic requirements are fulfilled already. If Business Intelligence operations are not actively developed, the companies fear the project to start impeding. Thirteen percent of the companies consider acquiring and analysis of business information critical for all operations. Business Intelligence is deemed as a prerequisite for competitiveness.

#### **What types of changes are you expecting in Business Intelligence operations in the next five years?**

Nearly 95 percent of the companies feel that Business Intelligence operations will increase in importance in the next five years. Business Intelligence is expected to become an even more significant instrument for business management and decision-making. Ten percent of the companies believe Business Intelligence to become more common all-around, also in small businesses. Currently, about a tenth consider Business Intelligence as an activity mainly for large corporations and as “design management”.

Over half of the companies believe and partly hope Business Intelligence to become an integrated part of normal business operations. Only then would Business Intelligence increasingly become an established and a widening element of the entire organization and no longer an isolated function.

About 75 percent of the companies consider Business Intelligence information acquisition a need-based practice. These firms believe the content and a humane approach to be the key aspects of Business Intelligence. Hence, technology is only considered an assisting tool. The rest, 25 percent, feel that Business Intelligence is mainly a technology, and believe the technological approach to Business Intelligence even increase in the future. These firms feel that operations regarding Business Intelligence are currently too manual. On the other hand, nearly all of the companies admit technology to make the operations easier. They hope technological tools to be developed in the future to become more clever and tailored for specific needs.

Nearly 30 percent wish for the methods of measurement for Business Intelligence to develop within the next five years. Currently, measuring is not being done as either no suitable measurement methods have been identified or the companies have no resources for such

activity. With the help of appropriate measurement methods Business Intelligence operations could be more easily proved beneficial and valuable, for instance to a management board not yet committed to the operations.

Over half of the companies believe that outsourcing basic information acquisition will increase in the next five years, as there is a need to increasingly prioritize operations. The companies also expect the dissemination of information to improve, when the contents of external information banks can be integrated into company portals. On the other hand, the companies question the increasing outsourcing of information acquisition, if the price and quality ratio of such services does not improve in the near future. About one tenth consider the current services being provided as too sketchy.

Twenty percent of the companies believe that in the future, acquisition and analysis of information will not be difficult, but the main challenge is utilization of the information. Efficient use of information requires an open sharing of it within the companies, and providing the management and decision-makers with more value-added pieces of information. A few global companies also mention that the international nature of their business sets further challenges for monitoring the business environment and analysis of acquired information. Sixty percent of the companies feel important that in the future the Business Intelligence operations utilize information from the whole value chain. Companies expect co-operation and networking to increase in Business Intelligence operations, as currently the benefits of the activities are only partly realized and utilized.

The notion that Business Intelligence is a comprehensive practice within companies is confirmed by this study. Business Intelligence incorporates people, processes, and also the information as an end product. In addition, most companies consider technology as a useful tool in helping in Business Intelligence operations.

The interviewees see Business Intelligence in the future as an enabling practice, which can assist in controlled management of businesses. On the other hand, the interviewees see Business Intelligence already a crucial element for competitive business operations.

## **CONCLUSIONS AND DISCUSSION**

This study is the first comprehensive study investigating Business Intelligence practices in Finland. According to the results of the study, Business Intelligence activities really have become common in Finland – or to be precise – in Finnish large-scale companies. These companies, most of them operating in a global market place, do invest to achieve sophisticated Business Intelligence applications in order to achieve better competitiveness through better decision making. Although the Business Intelligence related terms and practices have not yet become very well established in companies or in the literature, Business Intelligence appears to be the most popular term for systematic business information acquisition and analysis in Finnish large-scale companies. According to the results of this study Business Intelligence will become even more common in the future.

It was a slight surprise for the authors that Business Intelligence activities were quite young in the ICT sector. Only 17 percent of the companies in this sector initiated business information acquisition and analysis over ten years ago. The figures are higher in the other two industrial

sectors researched. On the other hand, the ICT sector was the only one in which 100 percent of the companies do have Business Intelligence activities.

Overall, the goal of starting activities for Business Intelligence activities has mainly been to increase the utilization and sharing of existing information resources in the companies. External application providers or consultants in the field did not seem to have any particular role in initiating Business Intelligence activities in the companies. Most companies have begun business information acquisition and analysis simply because they have realized a need for enhanced information and knowledge to support their planning and decision-making.

Cost or timesavings were not considered very important benefits among the interviewees of this study. The reason for this may be the fact that cost-saving benefits of Business Intelligence activities are long-term. Besides, cost and time are resources, which must be invested into Business Intelligence activities when a company desires any benefits. Now the benefits belong to the upper side of productivity function i.e. they are outputs achievable. It is obvious that cost and timesavings are not the first things, which come to a interviewee's mind when benefits noted. Besides, benefits gained from Business Intelligence activities are quite intangible, and therefore they are often difficult – or even impossible – to quantify.

The interviewees see Business Intelligence in the future as an enabling practice, which can assist in controlled management of businesses. On the other hand, the interviewees already see Business Intelligence already as a crucial element for competitive business operations.

To conclude, systematic business information acquisition and analysis is increasing in Finnish large-scale companies. Business Intelligence as a concept is becoming more common in everyday business life. Presumably, Business Intelligence activities will also become more systematic within the companies as the emphasis on business information acquisition and analysis increases.

According to this study, the companies do not consider Business Intelligence to be a hyped up fad. For most companies the driving force behind starting Business Intelligence activities has been a need to obtain knowledge about the business environment and its development to support operative actions. The notion that Business Intelligence is a comprehensive practice within companies is confirmed by this study. Business Intelligence incorporates people, processes, and also the knowledge as an end product.

As in the case of any survey, either an interview or mail survey, the validity of respondents' answers must be considered. This study is no exception. It is difficult to say when an interviewee's answer really represents the company itself or if it is only a subjective opinion. This is a problem, which we have to deal with when conducting such studies. Strengthening the validity of the data would require standardized questionnaires, numerous interviews in the same company or even conducting actual case studies. The last option may be the one, which will be adopted after this explorative survey.

The results of this study cover the Finnish large-scale companies belonging to the top 50 group. The results cannot be generalized to all Finnish companies. On the other hand, this was not the intention of this study. The top 50 group was found the most interesting in this case. The response rate reached 92 percent, which implies high reliability. Because of the

descriptive nature of the study, no statistical tests were made. On the other hand, when the data are examined in more detail in the forthcoming studies, more sophisticated analyses will no doubt be applied.

Several topics for further research have arisen during this study. Possibly the most interesting one deals with the nature of information and knowledge. It is obvious that an important part of the information needs in companies is very difficult to express explicitly. In the academic world, the nature of tacit knowledge has been explored for several years now. The concept of tacit knowledge could conceivably be used when seeking for better ways to specify the implicit information needs in companies. Another interesting topic in this framework is the nature of the information itself produced by Business Intelligence activities. In theory, the Business Intelligence process should turn business information into valuable knowledge and even intelligence. The authors have not been able to find a study exploring this area with empirical evidence. There is a lot of work to be accomplished by researchers interested in Business Intelligence.

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