THE POWER OF KNOWING

A Case Study on Data Driven Management

Tim Larsson
Robin Lundgren

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Abstract

Title: The Power of Knowing
A case study on Data Driven Management

Authors: Tim Larsson and Robin Lundgren.

Tutors: Tine Reuterdahl – *Director Insight and Innovation / Strategy and Product Development, FINN*

Daniel Vasiljevic – *Nordic Business Intelligence Lead, Accenture*

Carl-Henric Nilsson – *Dean of Technology Management and Assistant Professor, Department of Business Administration, Lund School of Economics and Management*

Anna Lindgren – *Associate Professor, Centre for Mathematical Sciences, Lund Institute of Technology*

Issue of study: The issue of the study is to find common denominators among successful analytical competitors and to analyze how the analytical capability is composed and how one can assess a higher maturity of it. Furthermore, is it to give suggestions on a road map to develop the analytical capability at FINN.

Purpose: The purpose of this thesis is to identify how companies successfully can leverage analytics to improve managerial decision-making. The conducted case study has been based on FINN.

Method: A systems approach with case-studies has been used.

Conclusions: To leverage analytics leadership is essential. Furthermore, a process orientation, experimental culture, a pull from business, customer centricity and a partnership between IT and business has been identified as critical business enablers. Furthermore, analytics should support the company's value drivers and be persuasive in the organization.

Keywords: Analytics, Business Intelligence, FINN.no, Enterprise Performance Management, Analytical Capability, BICC, Business Intelligence Competence Centre

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Abbreviations

Abbreviation	Explanation
ACA	Analytical Capability Assessment
BI	Business Intelligence
BICC	Business Intelligence Competence Centre
CoE	Center of Excellence
IM	Information Management
TDWI	The Data Warehousing Institute
I&I	Innsikt & Innovation; Insight & Innovation, a corporate function at FINN.no
M&S	Marknad & Salg, the marketing and sales function at FINN.no

1 Introduction

In God we trust; the rest bring data.

W. Edwards Deming, 1900-1993

1.1 Background

When companies offer similar products and use comparable technologies, identifying emergent trends early and optimizing business processes are one of the last sources of differentiation and competitive advantage.[1] Today the amount of data created within an organization is overwhelming. At eBay for example, 5000 business users turnover one terabyte of data and process 25 petabytes every day.[2] By analyzing this rich set of data, new insights can be gained and decision making improved. This management philosophy is called analytics and is a subset of Business Intelligence (BI).

Definition of analytics:

> *"Analytics are the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions. The analytics may be input for human decisions or may drive fully automated decisions."* [3]

Analytics has been adopted by corporate giants such as Procter & Gamble, IBM and Marriott International as well as been the core idea of startups such as Google, Capital One, Amazon and Netflix. They have realized the benefits of competing on analytics and have been able to create exceptional growth and value for their shareholders. One might argue that this is nothing new, statistical analysis became mainstream in the 1970s when SAS Institute and SPSS introduce applications that could be used by business people. This later developed into Business Intelligence, a popular field within the IT-consultant industry. These projects have been technically oriented and often focused on a narrow business problem, not visible to customers, shareholders or even senior managers. Companies competing on analytics however, has elevated this approach and made it the main driver of the company's corporate strategy and is being communicated in annual reports et cetera as a competitive advantage.[4]

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[1] Davenport, T.; Harris, J. (2007), *Competing on Analytics: The New Science of Winning*, 1st edition, Boston, Harvard Business School Press. p. 8
[2] Ericson, J. (2008), *The Velocity of eBay,* DM Review Special Report, p. 1
[3] Davenport; Harris, op.cit., p. 7
[4] ibid, p. 13

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Academically Professor Thomas H. Davenport at Babson College has been an evangelist with several articles in Harvard Business Review, Sloan Management Review and other highly regarded management journals. His latest book, co-authored with Jeanne G. Harris, Competing on Analytics: The New Science of Winning (2007) is one of the main inspirations to this thesis. McKinsey & Company identified analytics as one of the most important business technology trends of 2008[5] and Accenture has recently invested $100 million in information management services into this growing business area.[6]

Multifaceted challenges

The technical challenges of competing on analytics are not trivial, but fortunately well documented. However, implementing an analytical strategy in the organization is a complicated and risky project. The implementation of a BI solution is one of the most costly, complex, time-consuming, and resource-intensive IT venture an organization can pursue.[7] The reason for this complexity is that it is an interdisciplinary project that requires changes in how decisions are made, how work is conducted, corporate culture and the role of IT. Hence, how these risks are identified and managed is important to ensure success, and is the focus of this thesis. To illustrate the risk of letting IT drive change we would like to refer to a Gartner survey of 1.400 CIOs from 2006. The survey identified fact-based decision making as one of the most prioritized areas for 2007[8]. The same survey shows that only 20 percent of business users use these systems. One company that has a discrepancy between potential value and realized value is FINN.no; the market leader in classified media in Norway.

1.2 Issue of study

This thesis aims to address three questions:

1. How can one assess the maturity of a firm's analytical capability?

2. What are the common denominators among companies that successfully compete on analytics?

3. How can FINN begin the journey towards analytical excellence?

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[5] Manyika, J.; Roberts, R.; Sprague, K. (2008), *Eight Technology Trends to watch,* McKinsey on Business Technology

[6] Accenture, *Accenture satsar 750 miljoner på Information Management*, http://www.accenture.com/Countries/Sweden/About_Accenture/Newsroom/News_Releases/AccentureManagement.htm, retrieved 23/01/2009

[7] Zangaglia, P (2006), *Business Intelligence Deployment Strategies: A Pragmatic Pattern-Based Approach*, Business Intelligence Journal, Vol. 11, No. 3. p 56

[8] CRM2DAY, *Business Intelligence Software Market to Reach $3 Billion in 2009*, http://crm2day.com/content/t6_librarynews_1.php?news_id=117297, retrieved 25/01/2009

1.3 Purpose

The purpose of this thesis is to identify how companies successfully can leverage analytics to improve managerial decision-making.

1.4 Goals

The primary goal is to identify the common denominators among analytical competitors and develop a framework to assess a firm's analytical capability. The secondary goal is to develop a road map to enhance FINN's analytical capability.

1.5 Delimitations

General and specific delimitations are presented below.

General delimitations:

Time is the most delimiting factor of the project. Two dimensions exist to choose scope; breadth and depth. As concluded above analytics is an interdisciplinary and complicated subject, and the authors believe that it is essential to take a holistic approach to gain sufficient understanding of the subject and ensure validity of the road map. Since a holistic view of the subject and challenges is desired, it is therefore necessary to delimit the depth of analysis.

Creating a data-driven culture is a large undertaking that impacts almost every part of the organization. It is a risky initiative that must be managed with care. The Data Warehouse Institute (TDWI) has identified 50 critical success factors[9] (CSF) of an analytical initiative, presented in figure 1. These CSF's illustrates the complexity in managing an analytical initiative. While the technical aspects of implementing analytics are far from trivial, it is well documented and risks are controllable. On the business side of the equation, and the interception between the two, the academic field is relatively new and unexplored. The focus of this thesis is on the business side of analytics and on how to manage the first steps of an analytical program.

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[9] The Data Warehousing Institute,
http://download.101com.com/pub/TDWI/Files/BI%20Framework%202007-v5r.zip, retrieved 09/03/2009
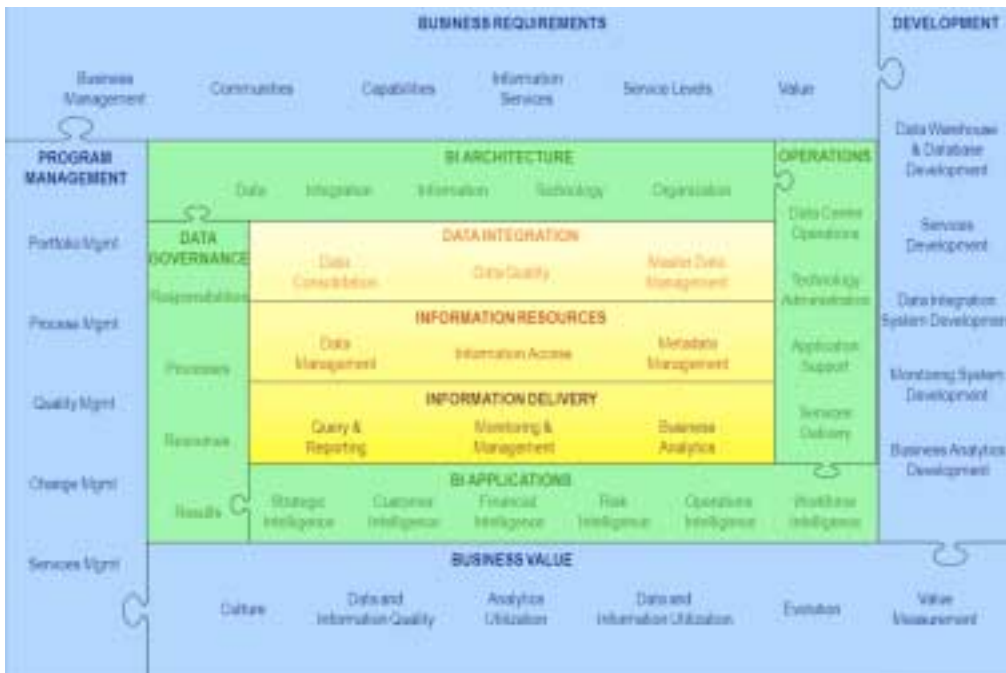
Figure 1: 50 Critical Success Factors of a BI initiative identified by TDWI.[10]

Delimitations in part II

In part II an assessment of FINN's analytical capability is performed. The corporate function I&I is the main stake holder of the project, hence the focus is on I&I and their near-time challenges and opportunities in implementing analytics.

Delimitations in part III

This is a pragmatic road map that is adjusted to the internal and external environment that I&I at FINN operates in, hence it's not a generic road map and must be revised before used at another company. Furthermore, M&S and IT is down-prioritized, as mentioned earlier the focus is on the challenges I&I faces.

1.6   About the authors

This thesis has been written by Tim Larsson and Robin Lundgren, both students at Lund University. Tim Larsson is a Master's student in Business Administration with a major in Technology Management. Robin Lundgren is a Master's student in IT and

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[10] The Data Warehousing Institute,
http://download.101com.com/pub/TDWI/Files/BI%20Framework%202007-v5r.zip, retrieved 09/03/2009

Telecommunications Engineering with a major in Technology Management. Technology Management is an interdisciplinary Master's program that unites business students with engineering students with a focus on strategy and management.

1.7 Target audience

The target audiences for this thesis are academics with interests in Business Intelligence as well as business people working with innovation, sales or strategic planning. Additionally, other students, corporations or people may find interest in reading the thesis to get a better insight in analytical companies and how to become more analytical.

1.8 Outline and disposition

Chapter 2 – Methodology

First the academic methodology for this thesis is presented. The overall validity and reliability is also discussed in chapter two.

Chapter 3 – Theoretical Framework

Then the theoretical framework of this thesis is presented. Three different academic fields are crossed in the thesis; *business intelligence, change management* and *performance management*. Furthermore, an assessment method to audit a firm's analytical capability is presented; Analytical Capability Assessment (ACA).

Chapter 4 – Establishing Best Practice of Analytics

The common denominators between companies that successfully compete on analytics are presented and analyzed in chapter four. These findings are based on conducted interviews with leading analytical competitors from several industries. The common denominators are analyzed from page 35 and onward. In addition interesting observations from the interviews are analyzed.

Chapter 5 – Analytical Capability Assessment at FINN

Becoming more analytical is not only about technology and data warehouses; rather it is a complex interdisciplinary change management project with many pitfalls and risks that must be managed carefully. This chapter presents the results (page 61) from the conducted assessment at FINN and findings from workshops (page 67) conducted at FINN to identify challenges.

Chapter 6 – Conclusions: The Road Map towards Analytical Excellence at FINN

To gain traction in the organization it's important to choose initial efforts that affect the bottom line within twelve months. The chapter presents a road map for how FINN could implement the BI program. These recommendations are based on conclusions from theoretical studies, best practice analysis, and ACA at FINN.

Chapter 7 – Suggestions for future research.

Suggestions for future research are discussed briefly. Three areas have been identified (1) Impact of process maturity on analytical capability; (2) Quantification of benefits from being data-driven; (3) how will analytical competitors change due to the financial crisis of 2009?

2 Methodology

If you can't explain it simply, you don't understand it well enough.

Albert Einstein, 1879-1955
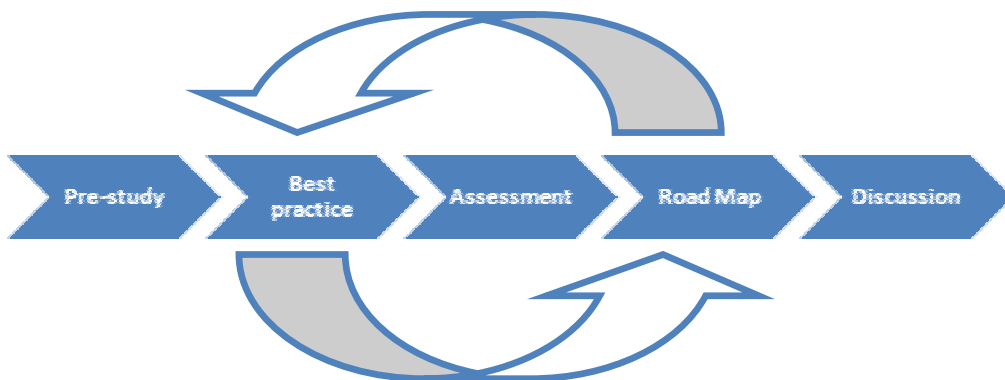
Figure 2: The working model of the thesis

The thesis can easily be divided into three distinct empirical sections; (1) Establishing Best Practice of Analytics; (2) Analytical Capability Assessment; (3) Road map towards Analytical Excellence at FINN. The research strategy has been to have a largely iterative working process, see figure 2. The authors have used SCRUM, a popular methodology used in software development projects to increase agility and efficiency, to write this thesis. To the authors SCRUM simply means an iterative working process where one has finished the whole thesis to the best of current knowledge. The purpose of this experiment has been to avoid the problem of reaching to the last part of the thesis and realizing that the first part had the wrong perspective. Although the thesis has been written in an iterative approach the thesis is presented linear. What can be read here is the final result, SCRUM has been a methodology to increase efficiency and raise the quality of the paper. The specific methodologies used in each part are described in more detailed in each chapter. Below follows the approach we have had for the entire thesis.

2.1 Research approach

Our chosen methodology is based on the systems approach and Eisenhardt's article *Building Theories from Case Study Research*.[11] The systems approach is commonly used within Business Management.[12] Eisenhardt's article (1989) presents a clear process in eight steps for the development of theories from case studies. These are explained below together with our comments on how we have chosen to apply this in our work.

2.1.1 Getting started

During the pre-study we defined a purpose and three research questions to focus our efforts. Focus is essential to systematically collect specific kinds of data, especially when the research has three different parts, all with different demand and need for data. Eisenhardt (1989) stress the importance of beginning the process with a clean sheet, to try to stay away from theories and initial hypotheses.

2.1.2 Selecting cases

A list of potential cases was created from literature studies and by scanning the web to identify the best players in analytics. The selection of cases, i.e. players, was based on availability of interviews and areas of expertise. We constructed a first draft for each case and assigned it a specific purpose. This was important for the outcome of the research, since the population defines the set of entities form which the research sample is to be drawn. The conscious choice of population helped to define the limits for generalizing the findings and to sharpen the external validity.

2.1.3 Crafting Instruments and Protocols

The thesis combines several methods of data collection, such as interviews, observations through workshops and keynotes, and questionnaires. Interviews were performed by the authors, where one handled the questions and the other recorded observations and took notes. As mentioned before, we have combined qualitative with quantitative data, where qualitative data indicates relationships and helps the research to explain, while the quantitative explains correlations and situations. The data collection was flexible and opportunistic to allow us to take advantage of any emergent themes during the collection process. By combining several methods, a possibility to triangulate the truth arises to provide a stronger substantiation of constructs and hypotheses.

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[11] Eisenhardt, K. (1989), *Building Theories from Case Study Research*, Academy of Management Review. Volume 14:4, p. 532-550
[12] Bjerke, B. (1981), *Some Comments on Methodology in Management Research*, Studies in the Economics and Organization of Actions, No. 8, Department of Business Administration, University of Lund, Sweden

2.1.4 Entering the field

Due to limited resources, mostly time, the data collection and analysis have been overlapped in an iterative process. This was done in order to gain speed and to have the ability to adjust the data collection during the whole process. This was accomplished trough continuously writing field notes, and a running commentary by both the authors. One key feature we did was to write down impressions directly when they occurred and react on as much as possible instead of trying to sort out what's important beforehand. The reason for writing a running commentary is that it is difficult to know in advance what will be useful in the analysis and conclusions.

2.1.5 Analyzing Data

The analysis parts have been one of the most important phases of the theory building process. However, it is normally also the least quantified and most difficult part of the research process. To effectively cross the chasm, between data collection and conclusions, we have used Eisenhardt's (1989) two recommendations. (1) To use within-case analysis. Within-case analysis is important since interviews and case studies normally produce a staggering volume of data. A within-case analysis is simply a detailed write-up and usually pure description. These write-ups were however important for us to gain insight along the project. The overall idea was to become familiar with every case as a stand-alone entity. This process made it easier to identify emerging trends before we started to generalize. (2) Search for cross-case patterns. By matching within-cases analyses, patterns emerged. According to Eisenhardt, this step is built on the fact that humans are poor at handling and processing information. It's in the human nature to leap to conclusions to early, leave out relationships that do not fit their conceptual model, and ignore basic statistical properties. To handle these information processing biases, we counteracted by looking at data from many different perspectives. One tactic we used was to select different categories or groups and then we looked for within-group patterns. The groups were identified either from the research question or existing literature. When a pattern from one data source, i.e. interview, was corroborated by the evidence from a second source the evidence became stronger and better grounded.

2.1.6 Shaping Hypotheses

It has been important for us to systematically compare theory with empirical data, and doing this repetitively, to form different hypotheses to test. By doing it iterativly, we have tried to increase the validity of our hypotheses. We have used Eisenhardt's two step process for shaping the hypotheses: (1) the first step was to constantly refine the definition of the construct, and build evidence which measures the construct in each case. (2) The second step was to verify, that the emergent relationship between constructs fitted with the evidence in each case.

2.1.7 Enfolding Literature

A broad range of literature in Business Intelligence and Analytics has been used. We have especially searched for literature with conflicting views. This has been a key process in our theory building. It has also been important and crucial, to link the literature with our empirical findings. This is especially important in case studies since the findings are often grounded on a limited number of cases.

2.1.8 Reaching Closure

We have performed six case-studies, i.e. interviews, and taken part in a two day conference about analytics, which together with all the literature is believed to be enough to come to accurate conclusions. According to Eisenhardt (1989) between four and ten cases is recommended, using too many cases make it difficulty to handle the complexity of all data.

2.2 Data collection

Jacobsen (2002)[13] divide data sources in three different categories; primary, secondary and tertiary. Primary sources are characterized by being gathered for the first time by the researcher and are called first hand or unprocessed information. The secondary and tertiary sources are primary data that has been gathered by another researcher. The difference between secondary and tertiary are to what degree to which the information has been summarized by the author.

In this thesis mostly primary and secondary sources have been used. For the first and second part, establishing best practice in analytics and conducting an analytical assessment, interviews where mainly used; which are classified as primary sources. Both authors conducted the interviews to minimize the risk of missing anything important and to avoid misunderstandings. Notes were taken during the whole interview and when allowed, the interviews were recorded. To analyze the findings we used secondary data sources such as relevant articles and books. The third part of the thesis, the road map to enhance FINN's analytical capability is based on the answers of the questionnaire from part two and from conducted workshops and is classified as primary sources.

2.3 Overall Validity

The validity for this thesis has been affected by the methodology choices that we have made. Despite the nature of data used the empirical findings overall validity have to meet at least two requirements; validity and reliability.

The validity aspect is that the findings and conclusions in the thesis are both relevant and valid. To ensure high internal validity, we've had several checkpoints during the

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[13] Jacobsen (2002), *Vad, hur och varför?,* Studentlitteratur, Lund, p. 472

work process of the thesis where our tutors at the university, Accenture and the objector group have commented and questioned our findings. To ensure that there have not been any miscommunications in the interviews, we gave the interviewees a chance to read their quotes and make changes before it was printed.

The external perspective of validity is to what degree the conclusions of the thesis can be generalized, i.e. if the findings are valid for other organizations or industries. Part one of the thesis where three common denominators are identified among the leading players can be seen as general, since the result is based on interviews with companies working in different industries. The questions in the assessment that were created and used in part two has been built on existing assessments and theories, but with FINN in mind. The authors see no reason why the assessment wouldn't work at organizations similar to FINN. However, the road map in part three is made for FINN, whether or not the results can be generalized is up to the reader, but the mindset for how to create a road map can be an inspiration for others.

Reliability aims to explain whether the empirical data is reliable and credible, if the chosen methodology and analysis have affected the results and whether the results can be repeated.[14] To ensure a high reliability, especially when working with quality data like interviews, it has been essential to constantly have this aspect in mind. It is hard to control the reliability of face-to-face interviews since many aspects effect the outcome, for example how questions are asked or the connection between the interviewer and the respondent. When our interviews were conducted, we had carefully constructed non-leading questions to minimize the risk of reliable issues.

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[14] Jacobsen, loc.cit.

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3 Theoretical Framework

If I have seen further it is by standing on the shoulders of Giants.

Isaac Newton, 1643 - 1727

This thesis is based on the resourced-based view (RBV). RBV states that the basis for a company's competitive advantage lies primarily in its resources, and not how the company is positioned on the market.[15] Analytics itself is not a source of competitive advantage; rather analytics should support and optimize the capability that is the main driver of a company's value and competitive advantage.[16] The theoretical framework consists of three different fields; Business Intelligence, Change Management and Performance Management. BI is the focal point of the thesis, the other two fields have been chosen since they are needed to implement analytics successfully. BI initiatives affect the whole company, or at least it radical changes some business processes and how employees conduct work, therefore they are commonly seen as change management projects. Performance management is needed to break down vision and strategy into measurable KPI's that BI can support effectively. This

> *BI is about getting the right information to the right people, at the right time, for the right reason.*
>
> - Don Healy, IBM

thesis is in the twilight-zone between management and technology and aims to decrease the gap between them, if only a little bit.

3.1 Business Intelligence

Business Intelligence *"combines products, technology and methods to organize key information that managers needs to improve profit and performance"* [17]

Decision-making assistance and BI can have a significant impact on the growth of a business.[18] There is considerable evidence that decisions based on analytics are more likely to be correct than those based on intuition.[19] However, Business Intelligence is

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[15] Barney, J. (2001) *Is the resource-based "view" a useful perspective for strategic management research? Yes* Academy of Management Review. Vol. 26 No.1 p 41-56

[16] Davenport; Harris, op.cit., p. 24

[17] Williams, S.; Williams, N. (2006), *The Profit Impact of Business Intelligence*, Elsevier, San Francisco, p. 2

[18] Vayghan J. A.; Garfinkle S. M.; Walenta C.; Healy D. C.; Valentin, Z. (2007), *The internal information transformation of IBM*, IBM systems journal, VOL 46, NO 4

[19] Davenport; Harris, op.cit., p. 13

not a new management mindset; it was first mentioned by Hans P. Luhn in an article in 1958. Luhn described *Business Intelligence System* as *"an automatic method to provide current awareness services to scientists and engineers".*[20] But with help of IT and today's technology, better and more accurate insights from data are possible.[21] The data for this can be found in current systems; including enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM), marketing, finance or other databases. The definition of Business Intelligence can therefore be seen as the combination of products, technology, and methods to organize key information that management needs to improve profit and performance.[22]

Three levels of BI

There are three different levels of decisions that Business Intelligence can support, see figure 3, all depending on the value of the decision and where in the organization the decision take place.

Figure 3: Operational BI support more lower-value decisions than strategic or tactical BI, but the collective impact of those decisions are significant.[23]

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[20] Luhn, H. P. (1958), *A Business Intelligence System*, IBM Journal, October

[21] Davenport; Harris, loc.cit.

[22] Williams; Williams, loc.cit.

[23] Eckerson, W. (2007), *Best practices in operational BI*, The Data Warehousing Institute, p. 5

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Strategic BI

Strategic BI is aimed to assist executives and managers to make informed broad-based strategic decisions of high value or to set business targets. The decisions can be such as; mergers and acquisitions, capital investments, introduce a new product line, strategic market position, expand the sales force or change a pricing model.[24] By processing data from various sources and turning it into insights, strategic BI provides managers with a comprehensive and clear picture of the current business environment.[25]

Tactical BI

Tactical BI, also called analytical BI, enables middle managers to analyze business trends by frequently comparing metrics with results from a previous month or year. This is often used to make weekly or monthly tactical decisions such as; how to allocate resources for the new budget, how to craft a new marketing promotion to optimize sales, or how to analyze the impact of a new system or project, or to improve product development, customer segmentation and targeting.[26,27,28]

Operational BI

While strategic and tactical BI have a mid to long term focus, operational BI helps to drive and optimize business operations on a daily basis, and in some cases, even for intraday decision making.[29,30] Operational BI supports a large number of business users, in all levels of the organization, to make better decisions every day in every customer transaction; it can be anything from identifying the company's most profitable costumers, how to treat a special customer segment, cross-sell offering, or simply to let decision-makers proactively track and respond to continuously updated operational metrics.[31, 32] These are repeatable, high volume and explicit decisions that

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[24] Eckerson, (2007), loc. cit.

[25] Taylor, J. (2009), *Putting Predictive Analytics to Work*, Decision Management Solutions, February, p. 4

[26] Eckerson, (2007), loc.cit.

[27] Quinn, K. (2008), *How Business Intelligence Should Work*, Information Builders, p 2

[28] Taylor, op.cit., p. 4

[29] White, C. (2005), *The Next Generation of Business Intelligence: Operational BI*, Information Management Magazine, May 1, p. 2

[30] Quinn, op.cit, p. 2

[31] Eckerson, (2007), loc.cit.

[32] Chemburkar, , A.; Keny, P. (2006), *Trends in Operational BI*, Information Management Magazine, July 1

customers react to. An organization's operational decisions are seen as personal and deliberate by customers, and should therefore be personal and deliberate.[33]

3.1.1 Analytics

A subset of BI is analytics, while BI includes data access, reports and analysis; analytics is "*the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions. Analytics may be input for human decisions or may drive fully automated decisions.*"[34] Instead of only answering what has happened, analytics can answer why it has happened, what will happen next and if it will happen again. [35] Analytics and BI will be used interchangeably in this thesis.

3.1.1.1 Primary attributes of Analytics

There are four primary attributes that an organization should support to become a full-fledged analytical competitor. Analytics should;[36] (1) support a distinctive capability; (2) be enterprise-wide; (3) have senior management commitment and vision; (4) a large scale ambition. These four pillars are not interdependent and companies can become successful competitors in analytics without one of them, but it will be difficult to compensate the loss.

1: Support of a strategic, distinctive capability

The company's distinctive capability is what makes the company successful, i.e. the distinctive capability is what the company does better than its competitors and answers how the strategy is executed. The distinctive capability varies in different industries and could be service, pricing, supply change, human resource management, predictive data or customer loyalty. High performance is accomplished when analytics support the distinctive capability; this also assures an alignment between BI strategy and the corporate business strategy. [37]

2: Enterprise-wide analytics

Data and analysis should be available throughout the whole organization and not exclusive to a small set of individuals or top managers. To manage all the data, and

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[33] Taylor, loc.cit.
[34] Davenport; Harris, op.cit. p. 7
[35] ibid.
[36] Davenport; Harris, op.cit. p. 34
[37] ibid.

too do it efficiently, a Business Intelligence Competency Center (BICC) or Center Of Excellence (CoE) is recommended. There are several arguments for this, three of the main arguments are (1) to collect all data in one place prevents the creation of data silos in different company units; (2) to ensure that only one version of the truth exist data must be consolidated. There is a risk with multiple databases, none-standardized names, attributes and calculations that different versions of the same object are created; (3) to gather the company's business and IT. This makes it easier for employees to become specialists in analytics. [38]
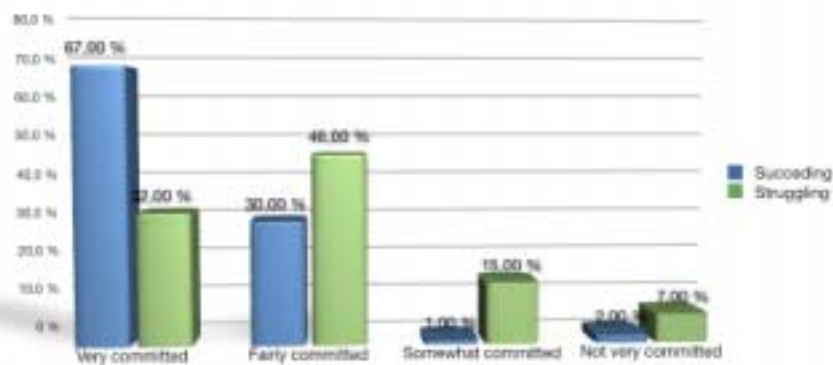
Figure 4: TDWI survey showing that leadership commitment is essential for BI success. [39]

3: Senior management commitment

Without belief, or true passion, in data and analytics from top managers, it is rare that the company can become an analytical competitor.[40,41] The adoption of analytics has a huge impact on the organization, and will change processes, culture, behavior, and employee skills. Top managers' support is needed to achieve such a great organizational change. A study conducted by TDWI concluded that senior management support is essential for BI success, see figure 4.

4: Large-scale ambition

The use of analytics for small incremental tactical use will give minor results, a substantial strategic or competitive imperative is necessary to achieve major impact. The successful analytics initiative mostly come from companies that bet their future

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[38] Davenport; Harris, op.cit. p. 34
[39] Eckerson, W. (2009), *Smart Companies in the 21st Century: The secrets of creating successful business intelligence solutions*, The Data Warehousing Institute, p. 15
[40] Davenport; Harris, op.cit. p. 30
[41] Eckerson, (2009), loc. cit.

on analytics, which in retrospective can be seen as rational, but at the time being were considered radical and separated from industry standard. [42]

3.1.2 Maturity models

There are many maturity models evaluating analytics and BI maturity. This thesis focus on two of them that the authors believe complements each other, one from Davenport & Harris and one from IBM. Both models have defined five levels of analytical maturity levels; Davenport & Harris' model range from *analytically impaired* to *analytical competitors* and focus more on business enablers. IBM's model range from *Data to run the business* to *Information as a competitive differentiator* and focus more on the technical maturity.[43],[44] Table 1 shows the framework for Davenport & Harris' which gives examples of the supported distinctive capability, questions to ask, objectives and metrics to measure in the different levels. Figure 5 and the following sections describe the context of what is characterized in each of the levels in the IBM model.

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[42] Davenport; Harris, op.cit. p. 32
[43] Davenport; Harris, op.cit. p. 36
[44] Vayghan; Garfinkle; Walenta; Healy; Valentin, op.cit., p. 677

Davenport & Harris' maturity model

Level	Distinctive capability	Questions asked	Objective	Metrics/measures/value
1 Analytically impaired	Negligible, *"flying blind"*	What happened in our business?	Get accurate data to improve operations	None
2 Localized analytics	Local and opportunistic – may not be supporting company's distinctive capabilities	What can we do to improve this activity? How can we understand our business better?	Use analytics to improve one or more functional activities	ROI of individual applications
3 Analytical aspirations	Begin efforts for more integrated data and analytics	What's happening now? Can we extrapolate existing trends?	Use analytics to improve a distinctive capability	Future performance and market value
4 Analytical companies	Enterprise-wide perspective, able to use analytics for point advantage, know what to do to get to next level, but not quite there	How can we use analytics to innovate and differentiate?	Build broad analytical capability – analytics for differentiation	Analytics are an important driver of performance and value
5 Analytical competitors	Enterprise-wide, big results, sustainable advantage	What's next? What's possible? How do we stay ahead?	Analytical master – fully competing on analytics	Analytics are the primary driver of performance and value

Table 1: Stages of analytical competition[45]

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[45] Davenport; Harris, op.cit. p. 36
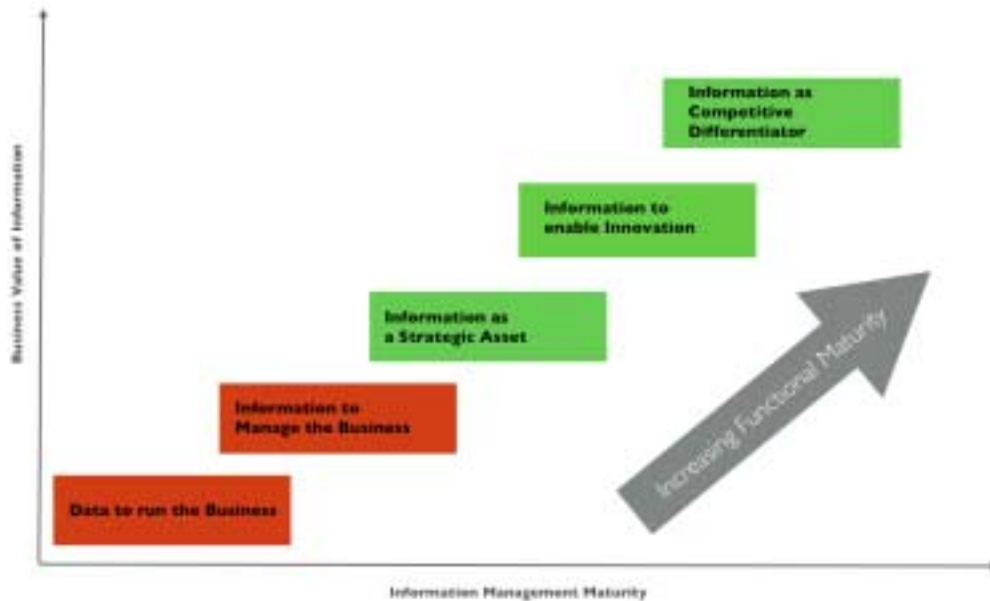
Figure 5: IBM – Five stages of information management maturity[46]

IBMs maturity model

1. Data to run the business - Basic spreadsheet reporting and information overload. There is no version of truth and decisions are hindsight based. Data are stored in silos and in non-integrated solutions.

2. Information to Manage the Business - Basic queries, reports and analytics. Multiple versions of truth exist, and some decisions have started to be automated. Information is still stored in data silos.

3. Information as a strategic asset - Introduction of role-based and contextual work environments. Only one version of truth exists in the organization. Business performance management has been integrated. Insights from analytics are made in real time. Integration of data silos has begun.

4. Information to enable innovation - Role-based work environment. Fully embedded analytical capabilities within processes and systems. Analytics used for

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[46] Vayghan; Garfinkle; Walenta; Healy; Valentin, op.cit., p. 673.

foresights and predictive analysis. Information is available as a service and embedded in native applications.

5. Information as competitive differentiator - Flexible and adaptive business environments across the enterprise. Business performance and operation are optimized. Analytics gives strategic insights. All relevant internal and external information are seamless and shared.

3.2   Change management

This chapter is based solely on the work of Kotter. Kotter is a well established author on the subject and his book *Leading Change* from 1996 is a Harvard Business School Press classic. Therefore we, the authors, have chosen to delimit this chapter to Kotters work. It is always better, from an academic perspective, to have several sources. Due to Kotters' strong position in academia and since this is not a major part of the thesis we have decided to lean only on Kotters' work.

Kotter has identified a list of common reasons why major changes in organizations are problematic. The explanations are inwardly focused cultures, paralyzing bureaucracy, parochial politics, low level of trust, lack of teamwork or leadership or the general human fear for the unknown.[47] To efficiently avoid or solve these barriers, Kotter has developed an eight-stage change process;

3.2.1   Establishing a sense of urgency

Low feel of urgency tend to make people less concerned and interested in working with the transformational process, hence it is crucial to gain needed cooperation in the organization. Often there is a problem with too high complacency, which in turn is correlated with an unwillingness to change.[48]

3.2.2   Creating the guiding coalition

To accomplish a major change in a large organization, one need a strong coalition that are able to develop the right vision, eliminate all key obstacles, generate short-term wins, and anchor the new approaches deep in the organization's culture. The coalition needs position power, expertise, credibility and leadership.[49]

3.2.3   Developing a vision and strategy

A clear vision is vital in order to motivate and coordinate different people to make decisions in the desirable direction. A good vision, followed by a strategy that provides both logic and a first level of detail of how it will be accomplished, can

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[47] Kotter, J. (1996), *Leading Change*, Harvard Business Scholl Press, Boston, p. 20 ff
[48] ibid. p. 35 ff
[49] ibid. p. 51 ff

simplify hundreds of detailed decisions and also make the inability to make decisions disappear.[50]

3.2.4   Communicating the change vision

It is essential that the new vision is communicated and gains understanding in the enterprise. The greatest impact of change can only occur when people involved in the enterprise share a common understanding of the goals and direction.[51]

Exhibit[52] in *Leading Change* (1996) visualizes the risk of how the change vision gets lost in the clutter of information that employees receives. The total amount of communication going to an employee in three months is 2,300,000 words or numbers while the typical communication of a change vision over a period of three months is 13,400 words or numbers. 13,400 words is equivalent of one 30-minutes speech, one hour-long meeting, one 600-word article in the firm's newspaper and one 2,000-word memo.

Calculation 1: 13 400 / 2 300 000 = 0.0058

The change vision captures only 0.58 per cent (see calculation 1, and figure 6) of the total communication market share among the employees. *Leading Change* were written in 1996, the amount of received information is certainley even greater today. The take away from this anecdote is that one must overcommunicate the message inorder for people to remember and see the message.
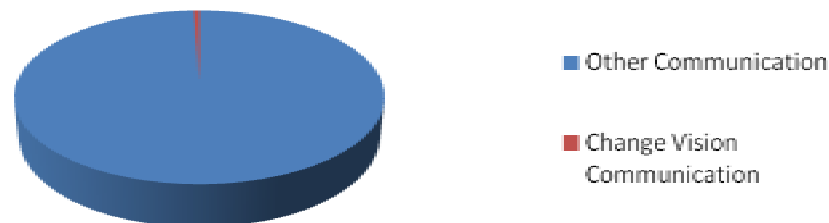
Figure 6: Illustration of how the communication of change vision gets lost in the clutter

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[50] Kotter, op.cit., p. 67 ff
[51] ibid., p. 85 ff
[52] ibid., p. 89

3.2.5 Empowering broad-based action

Even if employees understand the vision and want to help making it reality, there can be barriers or obstacles preventing them. Kotter have identified four barriers that are particularly important; (1) The enterprise's formal structure can make it hard for employees to act; (2) The personnel and information system doesn't support the change; (3) Managers discourage actions aimed implementing the new vision; (4) The employee lack the skills needed.[53]

3.2.6 Generating short-term wins

Short-term performance improvements are important for many reasons. They can provide evidence that the sacrifices are worth it, undermine cynics and self-serving resisters, reward change agents with a pat on the back, help fine-tune vision and strategies and build momentum.[54]

3.2.7 Consolidating gains and producing more change

It is important to keep the sense of urgency alive, not letting it fade away after a few short-term wins. Political and irrational resistance to change never fully dissipates, and there is a risk of regression.[55]

3.2.8 Anchoring new approaches in the culture

Anchoring cultural change take place last, not first, in a transformation process. Forgetting, skipping or failing in changing the enterprise culture may cause a regression. Shared norms and values need to be revaluated and communicated across the enterprise.[56]

3.3 Performance Management

Measuring performance is a central part of any BI initiative. In this chapter we briefly present the theory for balanced scorecard, value drivers and key performance indicators.

3.3.1 Balanced Scorecard (BSC)

Kaplan and Norton developed BSC in 1992. The underlying statement for BSC is that business performance should not be assessed using only financial indicators. BSC try to establish a link between a company's performance measures and the company's

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[53] Kotter, op.cit., p. 101 ff
[54] ibid., p. 117 ff
[55] ibid., p. 131 ff
[56] ibid., p., p145 ff

strategic vision by using a framework that consists of several metrics in four different perspectives; customer, internal, innovation and learning, and financial.[57]

The metrics in BSC does not solely focus on financial measures, but it assumes that eventually all metrics or indicators in the perspectives will affect financial performance. It is important that only the most critical indicators that will cause an increase in profits are reported. While indicators in the financial perspective show current performance will the remaining perspectives communicate a hunch about future performance, and suggest actions so that the desired future can be realized.[58]

3.3.2 Value drivers

A value driver is an action that affects a company's performance in short or long term. To be able to measure how well a company is performing, different quantitative measures of value can be used. The importance of a value driver depends on the company's fundamental micro economical environment. For example might customer loyalty be more important in some industries than others. Even companies acting in the same industry can have different value drivers; it depends on what strategy the company has. To know what drives value is relevant for the company for two reasons; it makes it easier for management to make good decisions and it helps management to prioritize among necessary trade-offs. [59]

To identify value drivers it is vital to develop a tree hierarchy for the entire company or at least at business unit level. The tree hierarchy is suitable since it is a systematic approach to analyze and visualize the connection between operational measurements and financial results. The tree should be developed iteratively based on different hypothesis on how operational measurements and financial results are connected. With regression analysis one can identify the relationships between the connections.[60]

3.3.3 Key Performance Indicator (KPI)

According to Parmenter many firms use the wrong measurements, many of which they incorrectly term KPIs. Parmenter argues that KPI represent a set of measures focusing on those aspects of performance that are the most crucial for an organizations continued success. There are only a few KPIs in a firm and they have a

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[57] Kaplan, R. S., & Norton, D. P. (1992), *The Balanced Scorecard - Measures That Drive Performance*, Harvard Business Review

[58] ibid.

[59] Koller, T; Goedhart, M; Vassels, D. (2005), *Valuation: Measuring and managing the Value of Companies*, John Wiley & Sons Inc, New Jersey, p. 420

[60] Ibid., p. 422

profound impact on performance if they are monitored constantly by top management. Some KPIs can be measured weekly, but most should be measured daily or even hourly. If a KPI is measured monthly it can be too late to react. Most organizational measures are indicators of what happened in the past month or quarter. According to Parmenter these measures are not KPIs. A good KPI have the following three characteristics; (1) it shows what action needs to be taken; (2) it goes deep enough in the organization that it can be tied down to an individual; (3) it will affect most of the critical success factors and more then one aspect of an organizations balanced scorecard. [61]

Kaplan and Norton recommends that a company should not have more than twenty KPIs, while Parmenter believes that ten KPIs is enough, and that in many cases it is appropriate to have even fewer.[62]

3.4   Analytical Capability Assessment[63]

Chapter 3.4 will try to answer the first of this thesis' three research questions: *How can one assess the maturity of a firm's analytical capability?* Theory of why and what an assessment should assess is presented below.

Why conduct an assessment?

A BI readiness assessment is crucial because it identifies gaps and areas where the organization is not ready to proceed with the BI initiative. By identifying BI gaps waste of time and resources can be avoided.[64] The key elements in measuring the maturity of an organization include methods to establish a baseline, a common enduring model of maturity, a comprehensive mean of self-assessment, and a common tool to establish a consistent set of criteria allowing each data domain to score itself. These elements enable the enterprise to conduct an internal dialog about its strengths, gaps, and actions and enhance its ability to focus on actions rather than penalties.[65]

What to assess

With empirical findings presented in part one (the next chapter) combined with work from other authors, most notably Williams & Williams (2007), Hammer (2007) and Davenport & Harris (2007) the authors of the thesis came up with the ACA. The structure for the assessment is based on Williams & Williams seven areas and three critical capabilities for BI success; (1) Ability to align and govern BI; (2) Ability to

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[61] Parmenter, D. (2007), *Performance Measurement,* Financial Management
[62] ibid.
[63] The questions in ACA are presented in appendix II.
[64] Williams; Williams, op.cit., p. 50ff
[65] Vayghan; Garfinkle; Walenta; Healy; Valentin, op.cit., p. 673f

leverage BI; (3) Ability to deliver BI.[66] The authors have added two areas to the first two capabilities; Leadership and Process Maturity. The third capability, ability to deliver BI, has been redesigned and is more specified than it was originally in Williams & Williams' framework. ACA is inspired from Williams & Williams and should be seen as an evolvement of their framework rather than an entirely new model. It is the combination of Hammers thoughts and Williams & Williams' areas of assessment with the addition of leadership and process maturity that is the contribution from the authors. Furthermore, the scenarios of each cell in the matrix (see appendix II) are based on the results from theoretical and empirical findings.
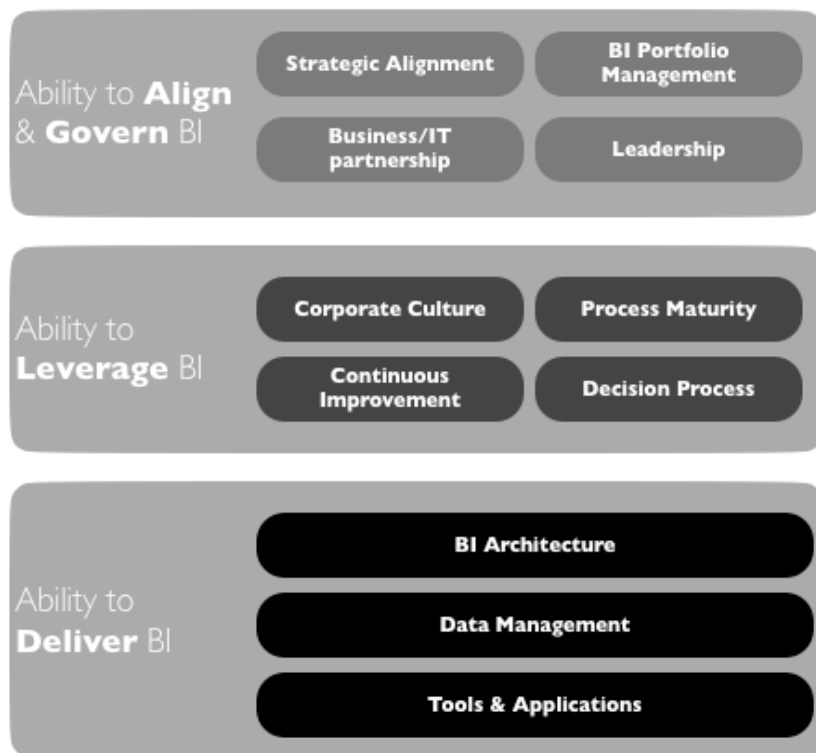
Figure 7: Overview of the eleven areas in ACA.[67]

Each and one of the eleven areas are divided in five different levels of analytical capability, see figure 7. The levels are based on a combination of three maturity

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[66] Williams; Williams, op.cit., p. 65ff
[67] Adopted from Williams; Williams, op.cit., p. 68

models; (1) Davenport and Harris (2007) maturity levels presented in chapter 3.1.1 (2) IBM's information maturity model presented in chapter 3.1.2 (3) Hammer's process audit[68]. Hammer maps out different levels of maturity by describing short scenarios at each level, see figure 8.

A pedagogic, easy to grasp, "traffic light" system has been used to visualize the answers in each maturity level. That way, gaps are identified quickly without the need for complex calculations and analysis. Green indicates that the organization has fulfilled the requirements of the level today. Yellow represent areas where the company has considerable work to do and red shows roadblocks that keep the process from reaching a higher level of performance.

Figure 8: Hammer's Process Maturity Audit design of the questions and the traffic light system. [69]

Below each capability and area of ACA is explained and motivated.

3.4.1   The ACA Framework

The authors have mainly focused on the business enablers and requisites of analytics; ACA is the abbreviation of Analytical Capability Assessment.

3.4.1.1   **Ability to Align and Govern BI program**

Ability to align and govern BI program evaluates the organizations capability to lead and manage a BI program from four areas; (1) Strategic alignment; (2) BI Portfolio management; (3) Business and IT partnership; (4) Leadership. These are presented below.

Strategic Alignment

In BI context strategic alignment occurs when business strategies and key management and business processes are consistent and reinforcing. BI initiatives should focus on improving those key management and business processes that drive

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[68] Hammer, M. (2007), *The Process Audit,* Harvard Business Review, April.
[69] Hammer, loc.cit.

profits. To deliver this cost efficiently BI must be supported by appropriate IT strategies, infrastructure, and IT organization.[70]

BI Portfolio Management

Focus on the business value of BI it is important, and a way to achieve this focus is to manage the BI initiatives as a portfolio of investments. By investing in the BI projects that have the largest return on investment it is also easier to gain traction in the organization. BI then solves pain-points and help managers to reach their business goals. BI is a part of the IT portfolio and must compete for a share of the budget. Companies who take a portfolio view of BI initiatives show a more strategic commitment to BI, and are thus more ready to capture the maximum business value from BI investments.[71]

Business and IT Partnership

Using BI to create business value requires continuous business leadership and involvement and strong partnership between business and IT.[72] According to Gartner the largest cause of failing BI initiatives is that it's still being driven by IT and not the business unit.[73] The same survey shows that 74 percent of BI initiatives are lead by IT. For BI to be successful, it has to be a combined effort between IT and all business units.[74]

Leadership

As one can see in 4, senior management commitment is important for BI success.[75] However, to succeed a company must have managers at all levels of the organization that do their part in the processes of turning the enterprise into an analytical competitor.

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[70] Williams; Williams, op.cit., p. 50

[71] ibid., p. 53ff

[72] ibid., p. 48

[73] Intelligent Enterprise, http://www.intelligententerprise.com/showArticle.jhtml?articleID=215801184, retrieved 2009-03-23

[74] Intelligent Enterprise, loc.cit., retrieved 2009-03-23

[75] Davenport; Harris, op.cit., p. 30

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3.4.1.2 Ability to leverage BI in the organization

Ability to leverage BI in the organization evaluates the organizations capability to act on the intelligence from four areas; (1) Continuous Improvement Culture; (2) Culture around the use of information; (3) Maturity of decision process; (4) Process maturity. These are presented below.

Continuous Improvement Culture

To use BI efficiently some degree of process change is necessary. According to Williams & Williams change management is often the most difficult aspect of a successful BI deployment. Organizations that have created successful process improvement cultures are more adept at changing business processes.[76]

Culture around the Use of Information and Analytical Applications

Needless to say, organizations that embrace the use of information and analytical applications to improve profits are better able to leverage investments in BI than organizations that do not. Corporate culture is also influenced by the environment in which the organization operates. For example, businesses in high fixed-cost industries (such as airlines, hotels and some manufacturing industries) have used highly sophisticated revenue optimization models daily for a long time. For these organizations it is easier to leverage BI.[77]

Decision Process Engineering Culture

The decision process can be improved by using BI in ways that capitalize on the availability of information and analytical applications to build a structured and repeatable decision process. Companies with experience with structured decision processes based on standard, fact-based frameworks are more likely to adopt BI successfully.[78]

Process Maturity

As many of the different critical areas concerning BI are about processes, a company with higher process maturity will perform better with BI than one with less maturity. The authors' arguments why process-orientation is important for success are mainly;

1. With process orientation each employee has a holistic view of their role and what purpose their work has to achieve customer satisfaction. This makes it easier to gain support for improvements in data quality, the use of enterprise-wide metrics and other information management initiatives.

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[76] Williams; Williams, op.cit., p. 51f
[77] ibid., p. 52 f
[78] ibid., p. 55 ff

2. In a process-oriented organization a process owner is responsible for process optimization and policy making. This makes it easier to implement changes and enforce data governance policies.

3. Process orientation is essentially customer focus. We see customer centricity as counter-balance to the quantitative analysts, this is explained further in part I.

The process design determines the performance.[79] The design specification specifies which people must perform what tasks, in what order, in what location, under what circumstances, with what information, and to what degree of precision.

3.4.1.3 Ability to deliver BI

Ability to deliver BI evaluates the organizations capability to deliver intelligence to business users from three areas; (1) BI Architecture; (2) Data management; (3) Tools and Applications. These are presented below.

BI Architecture

A critical requirement for capturing business value of BI is the technical ability to deliver information and applications that support BI. The BI infrastructure needs to satisfy and support each business area's requirements for information of varying complexity and enable a timely delivery of that information. The infrastructure should enable the BI strategy to grow and develop over time and allow solutions to be deployed across functional areas.[80]

Data Management

Data is the fundamental building block for BI application. In this thesis the authors emphasize the role of leadership commitment and business pull, however without high data quality and relevant data the initiative will fail.[81] Data management is about improving data quality and the design and enforcement of data governance policies.[82]

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[79] Hammer, loc.cit.

[80] Miller, G.; Bräutigam, D.; Gerlach, S. (2006), *Business Intelligence Competency Centers: A Team Approach to Maximizing Competitive Advantage*, John Wiley & Sons, Inc, Hoboken, New Jersey, p. 177

[81] Howson, C. (2007), *Successful Business Intelligence: Secrets to Making BI a Killer App,* McGraw-Hill, New York, p. 99

[82] Walenta, C. (23/02/2009)

Tools and Applications

Providing users with a BI tool that facilitates access, decision making, and action is essential for successful BI. If this fails the data warehouse is a waste of resources. Failed BI deployments have a higher rate of primarily custom applications. A common misconception about BI standardization is that all users must use the same tool. However, it is more important to use the right tool for the right user.[83]

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[83] Howson, op.cit., p. 171 ff

Part I

Establishing Best Practice of Analytics

4 Establishing Best Practice of Analytics

There is a better way to do it - Find it!

<div align="right">Thomas Edison, 1847-1931</div>

4.1 Background

Part I will try to answer the second of this thesis' three research questions: *what are the common denominators between companies that successfully compete on analytics?*

The question could be re-formulated using a common business buzz sentence; *what is best practice of analytics?* We, the authors, asked ourselves that question and traveled to USA searching for answers. We conducted interviews with leading experts and visited a start-up company that bases their entire business on analyzing data and we attended a conference about analytics with keynote-speakers from all over the world.

The definition of *best practice* by Wikipedia is:

"Best practice asserts that there is a technique, method, process, activity, incentive or reward that is more effective at delivering a particular outcome than any other technique, method, process, etc. The idea is that with proper processes, checks, and testing, a desired outcome can be delivered with fewer problems and unforeseen complications."[84]

Best practice for us, meant to search for companies that are known to be more effective and show better outcome than their competitors, we wanted to observe what they did different and how they did it. This is what part I of the theses is all about.

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[84] Wikipedia, http://en.wikipedia.org/wiki/Best_practices, retrieved 26/04/2009

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4.2   Methodology

In addition to the relevant theory in chapter three, interviews have been conducted with people that are experts on the subject to gather information to identify best practice of analytics. Semi-structured interviews were used to gather this information. This methodology was chosen to assure that the right things were discussed, but also to be able to follow up on interesting leads that arose during the interviews. An interview guide was written before each interview, stating the purpose of the interview, key factors and desired output of each interview. The interviewees were selected on the basis of relevance and availability for interviews, no attempt has been made to ensure statistical representativeness. Statistical sampling is often abandoned in field work and case studies due to practical constraints. The purpose has been to identify common denominators, current trends and common pitfalls within the field.

Information about the interviewed experts can be found in appendix I. Beside interviews the authors also attended Predictive Analytics World 2009, a conference on predictive analytics in San Francisco, where more than 20 case studies from more than 10 industries were presented.

4.3   Empirical findings

Our empirical findings are divided in two separate parts, see figure 9; (1) The results of a cross pattern analysis identifying common denominators among the experts; (2) Key empirical findings that the authors identified to be of significant value concerning Business Intelligence and analytics.

Figure 9: Structure for the empirical findings.

4.3.1 Common Denominators among the best

After an initial cross pattern analysis of the conducted interviews, a pattern emerged. Four common denominators among the interviewees were identified;

1. Customer centricity

2. Experimental culture

3. Analytical initiative should support critical business needs

4. Strong support from at least one analytical business champion

Each common denominator is presented below and concluded with an analysis. Denominator one and two are cultural aspects. It is difficult to determine whether they are the outcome of analytics or requisites to become a successful analytical competitor. It is clearer that denominator three and four are critical success factors, these findings are also aligned with theories in the chapter 3.1.1.

4.3.1.1 Customer Centricity

We have studied three well known customer centric organizations; Google, Amazon and Intuit. These companies have been founded by entrepreneurs with a true belief in the value of having a relationship with the customer (Intuit and Amazon) and on data-driven management (Google and Amazon). We have also interviewed with ADISN, one of the leading start-ups within behavioral targeting to see how companies can adapt their offering and create relevant messages and services. Three areas of customer centricity are presented; (1) Listening to customers on a scale; (2) Moving from CRM to CMR; (3) Why relevance is the new black.

Listening to customers on a scale

Mr. Kaushik points out that the web has given companies possibility to listen to customers on a scale. Before the web, a company couldn't really talk and engage with its customers. Now on the other hand, one can truly talk with them and take their perception of the brand; one can ask them *"Why are you visiting my website?"* and actually track what they are doing. This can be very powerful and gives completely new insights into current discrepancies between intention and outcome.[85] This methodology is also practiced at Amazon; users are regularly given the question on

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[85] Kaushik, A. (12/02/2009)

why they visited the site. Most users answers other reasons than to buy, such as check order status, read reviews, check what's new, et cetera. However, 50 % of those visitors bought something; On the other hand only 30 % of those who stated that they were at Amazon to buy, bought something. The discrepancy between what users say and what they do can give clues about possible problems with the service.[86]

Scott Cook, co-founder and executive chairman of Intuit, believes that the best way to sell is by having a good reputation.[87] This is accomplished by establishing an intimate relationship with the customer, and by truly understanding the problems that the customer is experiencing in his business. In the innovation process this view has had a significant impact on how work is conducted. Customer Driven Innovation has been a central part of the innovation process at Intuit for a long time. Since early 2000 Intuit opened up their innovation process and established an intimate relationship with lead users. By using intuitlabs.com Intuit has been able to have customers helping them solve problems, contribute with innovative ideas and to collect feedback. User incentives are mostly intangible aspects, such as status and a sense of belonging to a community, and not financial rewards. This has been, and still is, a challenge for Intuit to integrate customers on a scale. The initiative has been lead by Mr. Cook, the co-founder, who first-handed learned the power of tearing down the walls from Amazons success with user contribution (Mr. Cook is on the board of directors at Amazon). The transition has been difficult and Intuit still has challenges in transition to a data driven culture.[88]

When we met with Per-Kristian Halvorsen, Chief Innovation Officer at Intuit, Mr. Halvorsen clearly stated that Intuit is not a data driven organization today. However, this is one of Intuits focus areas, next to mobility and some measures has been taken to begin the transition.[89] Mr. Halvorsen does not see radical innovation coming from analytics, rather incremental or bug-fixes. A large-scale metrification cannot, according to Mr. Halvorsen, be used easily to generate ideas for new services. Instead Mr. Halvorsen argues that it is from engaged customers at intuitlabs.com that new ideas are generated. That is a completely different form of data collection than for an example web analytics. Intuit has been known for their user research, this can now be accomplished on a whole new level of scale. The quality of the data is lower, but it is compensated by the amount of data.[90]

Turbotax, a product from Intuit that helps Americans with their taxes is a good example of this. Intuit is paid when the customer submits his/her tax to the authorities. As American tax process is quite complex and since customers don't pay until they complete the process there is a strong incentive for Intuit to make it as easy to use as possible. The use of the application is seasonal, which gives high

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[86] Weigend, A. (19/02/2009)
[87] Halvorsen, P-K. (17/02/2009)
[88] Halvorsen, P-K. (17/02/2009)
[89] ibid.
[90] ibid.

concentration of users, about 110 thousand simultaneous users on the hundred most popular pages, out of totally five thousand pages. There are approximately 800 users on the same site at any given moment; 700 of them are probably confused but some may actually be able to help others. Intuit have integrated a live forum where users can ask questions. A small percentage of users, normally auditors, spend significant time answering questions on the forums. They do it for free with no possibilities to recruit clients; instead it seems to be status and the sense of belonging to a community that is the major incentive.[91] Mr. Chui has done a study for McKinsey & Company and identified the same incentives.[92]

Customer Relationships – Moving from CRM to CMR

Former Amazon.com chief scientist, Andreas S. Weigend, held a keynote on Predictive Analytics World on the unrealized predictive power of data. The essence of Mr. Weigends' keynote was the paradigm shift from the transactional economy to the relationship-based economy. Mr. Weigend argued that the purpose of Amazons recommendation engine is not to sell more books by cross-selling; this would be a short-term goal that could damage the relationship with the customer. Instead Amazons purpose is to help the customer find the best books and support the customer in the decision making process; this is a long-term goal that focus on the relationship with the customer and guides product development and managerial decision making at Amazon.[93]

Today companies do not own, nor control, the information about their products or brand. Communications is not just about companies targeting customer, but also customers communicating with each other. Customers like to read reviews of products before they buy them, but according to Mr. Weigend there has been a shift from relaying on professional reviews to trusting peer reviews, with as much as 6:1 compared to professional reviewers.[94] Today consumers are accustomed to peer reviews and the phenomena have flourished in many industries, especially hotels, restaurants, movies and books. Therefore, Mr. Weigend argues, it's a shift from Customer Relationship Management into Customer Managed Relationship. One should remember that this has not been the case for a long period of time, and that Amazon was very early to catch this trend.[95]

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[91] Halvorsen, P-K. (17/02/2009)

[92] Chui, M. (17/02/2009)

[93] Weigend, A. (19/02/2009)

[94] ibid.

[95] Weigend, A. (19/02/2009)

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The shift from transactional to interaction is now moving to relationships. In a transactional recommendation system it's enough to say that the people that bought x also bought y. In an interaction system the recommendation is people who looked at y bought z. In a relationship based recommendation system it's about leveraging the social graph. People relieve a lot about themselves in blogs, social networks et cetera. This is new territory which has large potential and requires new methods. To get this information companies have to have a customer centric view. They have to offer consumers something in return for their information, communications has to be bi-directional and valued by the customer.[96]

Why relevance is the new black

Using the user's competence or modus can be a possibility to segment users; advanced users can be presented with a different version than first-time users. The frequency of ads and questionnaires is also suitable to control by segmentation. The segmentation of users can occur passively, based on user behavior, or actively by asking questions. Segmentation is very powerful and lets the company control the brand experience.[97]

ADISN was founded 2005 based on belief that behavioral targeting can be prominent improved. During 20 minutes of web surfing a user may show several different behaviors and actions and it is therefore not optimal or effective to show ads based on a behavior that the user had 20 minutes ago. Behavioral targeting normally uses a technique of showing ads based on pages that the users have visit or searches they've made on a series of pages.[98] Andy Moeck, CEO at ADISN, says that their approach is to do a real-time evaluation of the users' current behavior. ADISN has indexed the social web to create a complex map of related concepts. They gather data from conversations taking place across the web. Sources are typically blog posts, MySpace interest, and Flickr captions. ADISN thereafter identify and rank relationships in a categorization database. This information is combined with both demographic and geographical information to be able to target specific audiences. To find suitable relationships for a specific customer ADISN crawl their website to identify which relationship data currently exists. When an ad is served information is gathered about the impression and about the visitors' previous page impressions. Furthermore, ADISN collects in-session browsing history to be able to analyze and weigh future impressions for the user. Which ad to show is determined by five factors:[99]

1. Strength of relationships between context and targeted audience

2. Advertiser performance on the impression's web site

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[96] Weigend, A. (19/02/2009)
[97] Kaushik, A. (12/02/2009)
[98] Moeck, A. (11/02/2009)
[99] ibid.

3. Advertiser requirement on impression limits

4. Remarketing opportunities

5. A small percentage is shown randomly to learn and evaluate

When the most appropriate advertiser has been chosen the ad is optimized by multivariate testing by testing different colors and versions of the advertisement. The combination of targeting ads for the user and then adapting the creative part of the ad has been proven to be very efficient. Increases in Click-Through-Rate up to 600 % have been accomplished.[100] To illustrate how the creative component can be adjusted to the target group we have included an example from an ad for AT&T, see figure 10.

Figure 10: Targeting the creative part based on audience. [101]

Across all industry segments the average conversion rate, the percentage of visitors on a page that actually buys something, is 2 %. This means that 98 % of the traffic on an average ecommerce site will not buy. By optimizing the design to increase conversion rate there is a risk that 98 % of the visitors get a bad experience. This is dangerous for the brand and is a short-term goal. By establishing several outcomes that connects to the vision and strategy of the website, optimization can focus on increasing sales and having satisfied visitors.[102]

Privacy concerns

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[100] Krupa, D. (11/02/2009)
[101] ADISN, http://adisn.com/ads/13/, retrieved 26/04/2009
[102] Kaushik, A. (12/02/2009)

Facebook is a recent sign that users and customers don't mind sharing information and letting it be used for targeting.[103] However, people are very restrictive with the ownership and integrity of their data as shown by the massive revolt against Facebooks' new terms of service (ToS) in January 2009. Facebook posted a new version of their ToS stating that they owned the users information indefinitely, even after if the user left the popular service. This unleashed a storm among bloggers and users and Facebook had to withdraw the new ToS within less than 24 hours.[104] This example shows that companies must think through how they use the collected information from an integrity and privacy perspective.

4.3.1.2 **Experimental Culture**

Harris and Davenport found in their research that analytical companies (level 5 companies in table 1) also are the most innovative companies in their industry. Harris argues that the reason to this is that they have the freedom to experiment. She states that analytics is not about data warehouses or technology; it is about asking the right questions and performing scientific experiments and draw correct conclusions from these. Ms. Harris says that management must decide if the purpose of analytics is to achieve growth or innovation, and then form hypothesis on how to achieve growth or innovation and run experiments to find answers.[105]

Mr. Kaushik states that companies with a web based product are very suitable for experiments. The cost of conducting experiments online is relatively low and one can reach statistical significance within hours.[106] Another advantage on the web is that one can take greater risks, since it is a controlled environment. By combining qualitative and quantitative data one can fail quickly. In the offline world it can take weeks to figure out if an experiment was right or wrong.[107] Mr. Kaushik has noticed that this flexibility has unleashed a lot of creativity for his clients. The freedom to conduct experiments that previously has been too risky creates an innovative environment.[108] eBay and Amazon are constantly running experiments on their website. The experiments are ranging from tactical aspects, such as the size of buttons, headlines, colors et cetera to more strategic experiments. By segmenting customers and conducting experiments they can challenge their current knowledge with what the data shows. Web Analytics gives unlimited possibilities to do this.[109] At Google more than 200 experiments are run every single day. Google segment their users so that new features aimed at improving usability are tested on novice users, while experiments on more advanced features are showed to lead users. These

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[103] Harris, J. (03/02/2009)
[104] Mashable, http://mashable.com/2009/02/26/mark-zuckerberg-facebook-tos/, retrieved 26/02/2009
[105] Harris, J. (03/02/2009)
[106] ibid.
[107] Kaushik, A. (12/02/2009)
[108] ibid.
[109] Harris, J. (03/02/2009)

experiments are done without the user knowing it. Google control risk by performing the more risky experiments on a smaller scale.[110]

Mr. Kaushik demonstrated Intuit as an illustrative example for doing high risk but controlled experiments. One of Intuits most popular products were sold in four different versions, priced at $20, $40, $60 and $80. A low level employee had an idea that if they decide to give the $20 version away for free it would give them new leads and make more people buy premium versions. Eighty percent of revenue came from the entry level version, so it was a very risky experiment. However, since the product was sold online risk could be controlled; only ten percent of the visitors participated in the experiment. Within one week Intuit had statistically significant results from the experiment; over 70 percent of the customers who "bought" the free version were new customers, such as students, that previously had not been prepared to pay for the product. Another finding was that many customer segments that normally would buy the entry level application now went for the premium priced version. This was a creative, but also a risky experiment that could not have been performed without the ability to control the risk.[111]

4.3.1.3 **Driven by Business need, not IT capability**

A common problem is that most analysts have such poor understanding of the web and the business. Analytics is not about statistics or technology, those are only tools to solve business problems. Analytical initiatives must not be owned by IT, if it is there is no hope for success.[112] This critical success factor was discovered in all interviews, and Mr. Kaushik even said that he would never accept even to lecture for a company were IT is the owner of the analytical initiative since it would be a waste of time.[113]

Ms. Harris uses an Accenture term, distinctive capability, for describing how analytics should be driven. Analytics is in itself not a competitive advantage; it gives a competitive advantage by supporting the business. For example Harrah's, the casino, their success is largely based on how they operate their service chain. Harrah's know their customers very well and can satisfy them in the best way. Their distinctive capability is how they satisfy their customers; it's how the corporate strategy is executed.[114] Mr. Chui says that the owner of the BI program depends on

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[110] Kaushik, A. (12/02/2009)
[111] Kaushik, A. (12/02/2009)
[112] ibid.
[113] ibid.
[114] Harris, J. (03/02/2009)

the company and its objective. But, he clarifies; to maximize the effect on the bottom line it should support the company's competitive advantage. So if the company competes on having the best customer service, analytics should support this function.[115]

To find the correct focus of the company's first analytical initiative, Ms. Harris says that one should begin with the overarching corporate objectives and work backwards. Ask questions like *"What are the value drivers in our business and with what actions do we affect them?"*. Best Buy, the world's largest specialty consumer electronics retailer, is one organization that successfully has accomplished this connection. Best Buy used to have *Customer Satisfaction* as one of their drivers, but after performing the regressions and analysis, they realized that instead it was *Employee Engagement* that had the greatest impact on bottom line. Today, Best Buy can predict accurately how much their total sales will increase if Employee Engagement rises 1 %.[116]

4.3.1.4 **Analytical Business Champion**

The forth critical success factor everyone we've interviewed agrees upon is the need of having at least one passionate business champion. The best and most easy way is if it is the CEO or at least a C-level executive, to gain traction in the organization.[117, 118] Even if top leader vision is vital to gain rapid culture change, all the leaders and sponsors within the organization are important. New initiative should focus on areas or investments that are going to contribute the most to the distinctive capability. To some extent one must go where there is support and data, but if there is a choice, prioritize the area that can achieve the biggest impact.[119] Ms. Harris experience is that managers seem to do it the other way around, to focus initial effort on areas where it won't have a big impact. One explanation could be that people are risk averse and want to experiment first. In the early stages it is important to realize that it is not possible to do everything at once.[120]

Identifying the business champion

Mr. Chui says that a BI basically is a change in culture, so it should be managed as any change project. Using leadership, role model and tools to inspire and coach the employees. Competitive pressure is also very important; it creates a sense of urgency within the organization.[121] Mr. Kaushik believes that one must change the mindset, and to do this one has to make people excited. Mr. Kaushik's did an experiment when he worked at Intuit; he stopped sending out the 200 reports that was normally sent out

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[115] Chui, M. (17/02/2009)
[116] Harris, J. (03/02/2009)
[117] ibid.
[118] Chui, M. (17/02/2009)
[119] Harris, J. (03/02/2009)
[120] ibid.
[121] Chui, M. (17/02/2009)

every day and waited for a reaction. In three weeks time, no one called him, no one asked where the reports where. Intuit had at the time a turnover of $2.4 billion and nobody in the company cared that 200 reports had stopped coming.[122] This was a clear signal for Mr. Kaushik that reporting was not the same thing as competing on analytics and being data-driven. Instead Mr. Kaushik gained traction by working with a middle manager. By serving this business unit with actionable insights that improved bottom line people became interested. Soon success spread and everyone wanted to be a part of it.[123] Mr. Kaushik calls this the *Superhero principle*, everyone wants to look good so make sure that by providing insightful data that will affect bottom line to one initial manager will create a surge for more. It is all about making managers excited, providing reports of page-views, hits et cetera will not make anyone exited, it has to be about money.[124]

Mr. Kaushik has three lessons when it comes to moving analytics onto the agenda; (1) do not tell managers personal opinions, tell facts. By presenting facts instead of trying to persuade someone, people can't as easy dismiss what's been presented; (2) Use third part or neutral data. Not the company's data and not personal data, but data from a neutral third party; with objective data, there is a greater chance that it will be seen as facts; (3) Show the managers video of customers using their product or website. This combines both the first two lessons, it is not a personal opinion and the data come from a third party.[125]

Another trend to drive adoption is to use presentation tools that are integrated into the normal workflow. By using different sorts of user-friendly data visualizations, complex data can be summarized and tailor-made for the specific user. For example, sales people who have no interest in seeing the entire high level math, only need to see the slides that tells them what they needed to do.[126]

Profile of Business Champion

The champion does not have to be statisticians; the important quality that they have is the insight into the business to ask the right questions. Not only "*What are my customers today doing?*" But also, "*What other customers are there out there?*"[127] The organization needs people who can do the analysis and who knows the limits of

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[122] Kaushik, A. (12/02/2009)
[123] ibid.
[124] Kaushik, A. (12/02/2009)
[125] ibid.
[126] Harris, J. (03/02/2009)
[127] ibid.

those analysis. They need to make sure that the assumptions are correct. Ms. Harris says that it's not that hard to find good statisticians, it's hard to find people that have the right mix of business acumen, statistical knowledge, technical knowledge, knowledge of the data and the ability to pull all of that together to an insight that is actionable.[128]

4.3.2 Interesting observations

Apart from the cross pattern analysis with the four common denominators, some interesting observations have been made from the interviews. These are presented below.

4.3.2.1 **Organization of BI program**

There are several options to organize the analytical initiative. All interviewees agree that all information in the company should come from one, single, corporate entity.[129,130,131] However, the conducted interviews do not point in a coherent direction on how to organize the initiative. The organization depends on several local variables such as the size of company, management support, technical infrastructure, purpose of initiative et cetera. Below are the different opinions that we came across during the interviews.

Centralization

With a centralized model, analytics is a corporate function. The role of the team is to build a common platform for the entire company. Their responsibilities include reporting, training, spreading best practice, and managing vendor relations. In a large company it is suboptimal to have lots of different tools and having several teams trying to get better at the same time. The challenge with a centralized team is that they struggle to understand the real needs of their users. The most common form of centralization is Business Intelligence Competence Center (BICC).[132]

Business Intelligence Competence Center

Ms. Harris experience is that if there is sufficient management support to do it in a centralized way, then a centralized center will move the organization to more mature levels faster. But one has to be certain that the support really exists and that is not just lip-service. If the organization is not willing to implement enterprise wide changes, it is better to launch decentralized initiatives and let them have some success to build momentum. It is very difficult to take an enterprise-wide grip from the beginning.

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[128] ibid.
[129] Chui, M. (17/02/2009)
[130] Harris, J. (03/02/2009)
[131] Healy, D. (10/03/2009)
[132] Kaushik, A. (12/02/2009)

Perhaps an enterprise wide initiative in IT can be a good start and then move on with operations, finance, marketing and R&D. The scope of the BICC must be clearly communicated to avoid misunderstandings and turf battles. [133]

The BICC should spread best practice and be a facilitator for standardizing common definitions. The average company has between 15-17 definitions of a customer in their IT system.[134] Getting all that data cleaned up is a large initiative and takes a lot of will and commitment that not many companies has today.[135] Furthermore, the BICC is responsible that information is up to date, controlled and validated. The BICC sets guidance, governance, services and metrics. They control the information and how information should flow so that it matches the IT blueprint.

Decentralization

Under the decentralized model, analytics is completely decentralized and the various business units are empowered to pursue any strategy that works for them. The result is potentially optimized business units or teams that are each running different tools and their own set of metrics. The challenge with decentralization is that each team is not leveraging any economies of scale or building any strategic advantage that should occur. This is often an expensive strategy. It is nearly impossible to figure out how to integrate data from other sources of the company or to measure customer behavior across the company website ecosystem.[136]

Decentralized centralization

The decentralized centralization model, created by Mr. Kaushik while working at Intuit, means that the company has a centralized team (BICC). The centralized team is responsible for implementing a standardized measurement system across the company in partnership with business units and functions across the company. The central team is also responsible for establishing various contracts, selecting technology solutions, and creating best practices. But rather than taking all the reporting and analysis tasks of the business an analyst is embedded in each of the business units. The business unit

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[133] Harris, J. (03/02/2009)
[134] Harris, J. (03/02/2009)
[135] ibid.
[136] Kaushik, A. (12/02/2009)

typically funds these analysts and therefore has some skin in the game. Since the analyst is close to the business unit it is easier to understand the business unit need and responds accordingly. The analyst still taps into and uses the centralized analytics platform and hence has to worry about only data analysis and not data capture, processing, and storage. Mr. Kaushik prefers this model since he believes that analyzing data is all about knowing the business.[137]

4.3.2.2 **Start with the data**

Ms. Harris says that the very first step when working with BI is to start working with the company's data. It must be correct, timely and consistent. Without data there is not anything to do. If a company does not have good transactional data, they could at least start with web data, external data or buy relevant data. She says that the amount of data that is needed is hard to say, but it is not to undertake lightly. It doesn't necessarily take six or seven years, as it did for Dell, but normally it needs a couple of years. Otherwise there is a risk to end up with data that is a statistical anomaly. Among the companies that Ms. Harris studied in the book, *Competing on Analytics*, the data gathering was a two to five year process. However, some companies accomplish to get value from their data in a couple of months. Ms. Harris says that a company can take data that they have lying around or that they can buy some external. This could probably be leveraged quickly and maybe after a year the company realizes that they are collecting the wrong data or that they need more data, and can then easily correct it.[138]

One definition, one version of the truth

In almost every interview the interviewee stress the importance of having one version of the truth. As mentioned earlier, according to Ms. Harris the average company has between 15-17 definitions of a customer in their IT system.[139] Mr. Walenta have similar experiences from IBM; Before the BI initiative IBM had several definitions of the term *delivered*, all depending on which department that were asked, but also the term *customer* and other key terms used in the company.[140]

Mr. Healy points out the risk that without a common definition a team might spend six months arguing about whom is right instead of spending six months doing product development. This is especially important for the companies that only have one single brand, if they don't make it to the market in the right time the whole company could be at stake.[141] Part of the problem is that the same data exists in several sources; sometimes with slightly different definitions and other times pure duplicates. Data entities are often managed in fragments and are stored in information silos. When

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[137] Kaushik, A. (12/02/2009)
[138] Harris, J. (03/02/2009)
[139] ibid.
[140] Walenta, C. (23/02/2009)
[141] Healy, D. (10/03/2009)

there is need for accurate and actionable reports, information silos cause difficulties. Information needs to be available to all levels of management responsible for operations and planning, or when fact-based analytics are used to forecast market demands, market opportunities, revenue and resources.[142]

Integration of data

Mr. Walenta says that integration of data trapped in silos is non-trivial, especially in a global firm like IBM with over 400 000 employees across seventeen different data landscapes. IBM has a yearly IT budget of more than $4 billion, where about $3 billion is spent on operations. In 2005, IBM started an enterprise transformation program to turn the company into an *on demand* business. In an initiative like this IBM faced a wide range of problems, and they focused on solving three specific challenges:[143]

1. *Trusted data sources must be established for enterprise-critical data*. This becomes a major challenge when ownership of data is fragmented in many areas, when there are multiple sources for the same data (each with its own unique definition), when existing data is undocumented and tightly coupled inside applications.

2. *Information must be integrated* – The main contributor to this challenge are platform dependencies, organizational issues, tight coupling with business processes, and lack of business data standards and an enterprise data model to define an explicit relationship among entities from multiple domains.

3. *Data quality must be improved* – This is a major challenge in any enterprise with a large amount of data in which data fields are not standardized, multiple ways of capturing the same data are used, and data is copied in many places.

The elimination of information silos could not be achieved simply be defining and implementing a technical architecture. IBM's internal enterprise architecture program has six, closely integrated, elements:[144]

1. *Maturity Model* - Measurement of progress in the information transformation process.

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[142] Walenta, C. (23/02/2009)
[143] ibid.
[144] ibid.

2. *Enterprise data architecture program* – Documentation of the current landscape, definition of a target Service Oriented Architecture-enabled architecture, and a road map indicating how to migrate to that architecture from the current environment.

3. *Process* – Common processes for the creation and maintenance of enterprise core data entities.

4. *Data governance* – An integrative management system for structuring, describing, and governing data as an enterprise asset.

5. *Culture* – An organizational culture to support the elimination of hurdles to reuse data.

6. *Skills* – A program to train employees and develop the critical skills that are needed in the data area to implement and maintain the enterprise data architecture program.

Among the interviewees there is a consensus that data quality is an ongoing process and it is not an IT-problem. It is in everybody's business and interest to maintain a high level of data quality. This can be achieved by good IT design, and information management guidelines and principles.[145, 146, 147, 148, 149]

4.3.2.3 **Don't stop investing!**

According to Mr. Healy most companies stop investing money when they've reached level two in the IBM information maturity model, presented in 3.1.2. This is because then the company has enough of information that they need to run the company. They can produce products and take orders; they're bringing in revenue. Everything else than spending money on BI is important; it can be for example R&D, the next product or the next marketing campaign. The longer a company stays in business and the more products they produce, the more complex their IT infrastructure will become. At the same time the demands from the market place will become higher. One cause for this is that companies are evaluated on expenses and revenues, so if a company can make money and keep the expenses low they look good. This is until the competition is doing something better and the marketplace is moving faster than the company. Mr. Healy says that this is the reality for some companies; all of a sudden they ask themselves *"How come we aren't the leading player anymore? What opportunities do we have in the pipeline?"*. Mr. Healy believe that there is an natural inclination in companies to build their IT and BI to run their business and become successful and

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[145] Walenta, C. (23/02/2009)
[146] Kaushik, A. (12/02/2009)
[147] Chui, M. (17/02/2009)
[148] Healy, D. (10/03/2009)
[149] Harris, J. (03/02/2009)

not realizing that if they do not continue to invest beyond level two they are going to waste the strategic asset that comes from information. To illustrate this let's look at an example from IBM of what can be accomplished when data that currently are stored in silos across the organization is integrated; Every Monday there are 55.000 reports available to sales people at IBM, ranging from single sales representative up to management level and then CEO. These 55.000 reports are integrated to total revenue at stake and the total sales of last week. Sam Palmisano, CEO at IBM, sees this every Monday morning; it is loaded every weekend to his dashboard. It comes with traffic lightning; Green tells that everything is going according to plan, yellow means that there are some risks and red indicates that they are behind. IBM can then relocate resources to where it is needed the most. IBM has this conversation every Monday to Friday, one conversation world-wide. Instead of arguing who has got the right data, they are talking about solving problems and closing business.[150] It is nontrivial to achieve this kind of integration.

Mr. Healy continues telling that when a company push through to level three and beyond and begin to discover the ability to look at opportunities and their financial position today they realize the benefits of a high level of integration across the landscape of the corporation. It is then clear how valuable that information is and how agile the company has become. The company can then begin to optimize the supply chain, the inventory, the release of the next product and be where the market wants it to be, when the market wants it. Instead of being a laggard the company can become proactive. The first step in integrating information as a strategic asset is to integrate it in a business context. By doing this the company can see where the market is going instead of seeing where the market is; that's a competitive advantage.[151]

4.3.2.4 Importance of a BI assessment

Ms. Harris presents in her book five levels of maturity within three areas (Organization, Human and Technology), the reason for this is that there's such a demand for classification. Everyone gets obsessed by these levels and that is the problem of defining them. Ms. Harris opinion is that by talking to managers they can themselves come to consensus of their firms' maturity level and their organization capabilities within a few minutes. The importance of models is to identify gaps, not to exactly pin-point the level of maturity. These should be used as a guideline for improvement.[152]

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[150] Healy, D. (10/03/2009)
[151] ibid.
[152] Harris, J. (03/02/2009)

Mr. Healy is responsible for conducting maturity assessment across IBM's seventeen data landscapes. He on the other hand is in favor of conducting assessments; getting people to realize that they have no documentation, no prioritization and no road map to solve their much known data problems is an important starting point to gain traction for conducting an assessment in the organization.

The important thing for IBM was to get consensus and not focusing on the score. Mr. Healy agrees that scoring can focus the team on the wrong issue. If a team scores a two or a three is not what's important, instead it's realizing that they have a problem and that they'll see what pain it causes. If they can get consensus regarding what the problem is and that it's persuasive and related to a critical metrics the department has promised to deliver; then they must fix it. Mr. Healy says that if the gap that stops a team from doing what they've promised to the company, to a customer or to reach revenue goals, sales goals and profitability goals - they need to fix it.[153]

One must define a vision of where does the department or company need, from an information management perspective, to be to deliver full potential.[154] Mr. Healy experience is that the best assessment comes from the team themselves. They know best if their data serves their business needs. Mr. Healy sees himself and the tool they constructed for the assessment as a facilitator to uncover current pain points. Each statement is evaluated during a workshop with five or six people from the evaluated team. There are five levels of scoring which corresponds to IBMs' information maturity model presented in chapter three, and a two year perspective. The evaluated team must have members from both business and IT so that consensus can be reached. IBM then combined the assessment with the information maturity model to construct the road map. The criticism that has been against this way of conducting assessment is that it takes long time. The main focus of IBM's assessment is on information management, and it is not until recently that they have added aspects such as organizational effectiveness and corporate culture.[155]

A factor that has been essential for IBM's success in integrating data landscapes and improving their information maturity level has been that IBM is very process-oriented. Mr. Healy sees this as essential to information management as it have made managers and employees see their work in a more holistic perspective and talk to each other with better understanding than before.[156]

4.4   Analysis

During the empirical study we saw and heard lots of examples of companies that had succeeded with their BI initiative. They had successfully turned their corporate culture into a fact based culture where the norm was to base decisions on data, not on

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[153] Healy, D. (10/03/2009)
[154] ibid.
[155] ibid.
[156] ibid.

intuition. This information, together with relevant theories and the key data from the empirical study, have been summarized into nine key success factors for both launching a BI initiative and to make it evolve.

The key points from the theory and our empirical findings and are the following subjects that are discussed further later in the chapter:

1. Focus, Focus, Focus

2. Analytical Leadership

3. Corporate Culture

We heard and realized during the empirical study that there is a risk that the company, when launching the first BI initiative, feels overwhelming. As figure 1 in chapter 1.5 shows, all different subjects that are included in BI can at first sight look like a jungle, all with more or less complex relationships to each other. To determine where and how to begin the journey to become an analytical competitor is not trivial. Therefore, it is of high importance to have a clear vision and strategy for the BI initiative, and not focus or argue about small details.

4.4.1 Focus, Focus, Focus

It is essential to focus on three areas. (1) Affect bottom line; (2) Start small, think big; (3) Identify business champion.

Affect bottom line

As Ms. Harris stated; *"It's important that the capability that BI supports have a distinctive affect on bottom line"*[157]. Many companies make the mistake to focus initial efforts on areas of the business that is not important. The strategy is risk averse but dangerous; if the initial initiative does not increase revenues or cut costs it will be very difficult to build momentum in the organization. We have seen that it is very easy to shut down BI initiatives if they don't immediately show a positive ROI, there is always something else that can be prioritized especially in these times of crisis, such as doing investments in marketing, R&D or sales.

Start small, think big

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[157] Harris, J. (03/02/2009)

Regarding the question if the BI initiative should start with a large or small approach, i.e. if one should try to change everything at once or start with one problem at a time, the experts we have talked to have answered differently. Ms. Harris argues that there is no general answer to this question that will work in all situations, and that it depends much on the specific company; their size, their current use of data, their processes maturity, et cetera. Mr. Kaushik on the other hand argues that resources are always scarce in the beginning and instead of spreading them it is better to focus initial efforts and then let success spread. Once the first project is a proven success it is easier to free resources for the next one. All that we have interviewed agree that it is important to build a scalable infrastructure that can grow when traction is accomplished. A small and more focused approach comes with less cost and risk, which are arguments for this approach. But, no matter if the initiatives starts with a wide or focused approach, one should always think big, and have this in mind when designing new processes and systems.

Identify Business Champion

The success of the BI initiative can not only be secured by focusing initial initiatives, one must also identify a passionate business champion inside the company. One that most probably is a senior, well respected and that have the ability to push through priorities and changes in the current culture. To identify a business champion was also recognized as one of our common denominators. The road to BI success can be curvy and tricky so it's a good thing to start with a capability where employees are more open to change and where processes are ready for a fact-based environment. The role of the business champion is to create inspiration for other business units to start work in a similar way. A successful BI case from within the company is likely to create a demand from other business units for more information and making them develop and design their processes from a BI perspective.

4.4.2 Analytical Leadership

Leadership has been identified as a critical success factor. Three areas of analytical leadership are discussed below (1) Support and use the system; (2) Change management; (3) BI initiatives must be a pull from business.

Support and use the system

We saw in our study that all companies that are successful in analytics, senior management both trusted, supported and used the BI system. Without senior support, the required change of current business process and decision making will probably not be possible. Senior managers should demand that information for decision basis come from the system, like in the case of IBM. By reassuring that everyone is using the system; changes will occur faster and will push IT to develop the system further. One could say that it will become like a positive spiral. When all data comes from a single trusted source, the discussion is no longer focused on which data that is correct, instead the focus lies on how to act on the information.

Change Management

One of the areas, which often are greatly underestimated by managers, is the cultural change that initiating a BI program requires. In order to make changes in the processes of how individuals, teams and the organization conduct their work, a structured approach is needed. It is essential for the success of BI initiative to create understanding and awareness for why and how the company will change, and to create a sense of urgency. To identify the business champion and create a successful business case is a good start and can spread knowledge and positive vibes about BI. To create awareness about the change towards a more fact-base working process, the company can conduct a BI maturity assessment. It can create a sense of urgency and raise awareness for change in the company.

NEVER, NEVER make it an IT matter. I refuse to speak to IT people; they don't have the power to drive change.

\- Avinash Kaushik, Google

BI initiatives must be a pull from the business

The BI initiative, should as we've mentioned above, support a capability that affects bottom line. This can only be accomplished if someone on the business side is willing to act on the insights and information that the BI system supplies with. In order for this to happen, the initiative must start and come from the business and not from IT. This is one of the most critical success factors that we have come across and it is one of the two things that all our interviewees agree up-on; IT should be a partner, not an owner, because if they are, quoting Mr. Kaushik "*You are doomed*". Too many times we have heard about BI projects that were started without analysis of the business value of the initiative. If business users don't see the value and how they should act on the information, it will not change how the business is conducted and probably end up on a shelf somewhere.

4.4.3 Corporate Culture

As we mentioned several times before; implementing analytics will have a great impact on the company's culture. One of the most notable in the empirical study was how BI was reflected in the interviewed companies' cultures. There was an authentic wish in the culture to improve how they worked, their processes, their products, et cetera. There were incremental improvements to constantly optimize performance. We've seen that some cultures are easier to change than others. The characteristics that we've seen contribute to a smother implementation are lean thinking, experimental culture and the presence of a process for decision making.

Lean

We have seen that the lean philosophy and analytics have several things in common, which is also confirmed by Mr. Kaushik. The mindset to cut waste, measure, optimize and change continuously makes the transition to analytics less dramatic for an organization with knowledge in lean. Analytical competitors have for the same reason been using lean for a long time and are generally very mature users. Rolling out lean and analytics in parallel processes can therefore be suitable for a company.

Experimental culture

To be able to constantly improve the performance or to test new ideas, companies need to perform experiments, testing hypothesis. First of all, employees must have been given the mandate to experiment and perform studies. Experimental culture was something that Mr. Kaushik strongly believed in and that Ms. Harris said was not giving enough of attention in hers and Davenport's book.

Experiments have been a core competence and natural part of product development, marketing, sales and sometimes even human resources. While quantitative analysis is important we want to stress the importance of qualitative studies as well. This can be accomplished by follow-home-studies, usability labs, eye-tracking et cetera. One might argue that experiments are expensive, but the experts we've been talking to think that the ignorance of not experimenting is even more expensive. We've seen significant improvements in the success rate of product launches, customer churn rate, and decreased marketing costs. However, the important lesson here is not that a company has the technology to do experiments; rather it's having the culture of testing theories in real life. As mentioned before, there should be no discussions in the office whether they should do alternative A or B, do both and let the customers decide. Though this is not suitable for all kinds of decisions, such as radical innovation, it frees creativity and increase transparency.

Process for Decision Making

We have seen that companies that have a rigor decision making process will better welcome and see the use of organizational decision support. These companies are more accustomed to having a well defined process for how to make the decision and on what base. This increases personal accountability, makes corridor politics less important and makes it easier to go back in time and see what metrics or KPIs the decision was made upon, in order to conclude if the decision was accurate or not. This key point is related with the one that managers need to support and use the system. Managers should only accept decisions from the employees that have been conducted using the decision process in the right way.

Part II

Analytical Capability Assessment at FINN

5 Analytical Capability Assessment at FINN

There are two kinds of statistics: the kind you look up and the kind you make up.

<div style="text-align: right">Rex Stout, 1886-1975</div>

5.1 Background

FINN is the market leader within classified media in Norway. The company was founded in 2000 and has had a remarkable growth, with a turnover of more than 700 MNOK and approximately 300 employees in 2008. Their website, www.finn.no, has more than 3.9 million unique visitors every month and there are more than 300,000 ads on FINN on an average day.[158]

FINN collects data from a wide variety of sources, ranging from sales force activities to website usage and transactions. This data is largely unused except for ad-hoc reporting needs. However, there is significant management support to change how they use their data and this thesis is one part of a major initiative to improve FINN's analytical capability. To make an improvement and to be able to conduct a road map for this mission, FINN first must get knowledge of where they stand today. Part II of this thesis is an audit of FINN's present analytical capability.

5.2 Methodology

To assess FINN's analytical capability two different methods where combined. First, qualitatively assessing the readiness and insights into challenges were elicited from two workshops with leaders at FINN. Secondly, to get a holistic view of the organization and to be able to identify if true support existed, and not only lip-service, ACA was sent out to the organization.

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[158] FINN,
http://www.finn.no/finn/article/finn_about_us?template=templates/static_template.jsp,
retrieved 05/05/2009

ACA is built upon the empirical findings and academic theories that can be found in chapter 3.4. The questionnaire was sent out to the entire organization, different questions were asked depending on the position of the respondents, see Table 2. The reasons for sending it to the entire organization were; first of all, to get a more accurate result from the assessment and second, to start raising the BI awareness among employees and to prepare them for the coming organizational changes.

Capability	Respondents position
Align and govern BI	Management team at each AS
Leverage BI	All employees
Deliver BI	IT architecture

Table 2: Overview of what questions different respondents were asked.

To avoid language misunderstandings and to get more valid results, the questionnaire was translated to Norwegian. Also, a test group of people from the company tested the questionnaire to identify questions that could be misread or misunderstood. ACA was sent out as a questionnaire by email. To achieve a higher answering frequency the mail was sent by a member of the top management team.

In addition to ACA, input comes from three activities; (1) a presentation of best practice by the authors with a following discussion of how to proceed at FINN with the management team of Strategy and Product development, the business function responsible for the BI initiative; (2) A workshop conducted with senior management, the BI project leader, IT and representatives from the sales organization with the purpose to identify goals and vision for the initiative, key activities, risks and organizational hurdles; (3) Interviews with leaders at FINN performed by the project leader of the initiative, Mr. Oppegaard.

5.2.1 Validity

Due to some technical issues the assessment where sent out in two parts, where the questions to the second and third capability was sent out first. The answers to these capabilities can to some extent be questioned. Although we conducted pre-tests, translated the questionnaire into Norwegian, and simplified the statements in several iterations, we received negative feedback from some employees. We had failed in the communication that the statements in the assessment were on an increasing scale; from basic or low maturity, to advance or high maturity.

Furthermore, some questions were perceived as too complex and even confusing. Some employees miss the alternative "Don't know". So there is a risk that people gave answers to questions they did not understand.

The negative feedback came from a few people, it's hard to say if this is something that all of the 104 respondents felt. But when talking to people randomly they agreed that it was a though and complex questionnaire. We believe the overall results to be valid, although a few questions have been left out of the analysis. As we see it, the biggest harm is the credibility of the assessments results in the organization.

We listened to the feedback that we had received and made changes to the questions for the first capability before sending it out. We made the questions easier to understand and added a "don't know" alternative before sending it out. With the invitation to the assessment we also added a Q&A, answering questions that we had received from the feedback from the first assessment.

5.3   Empirical findings

To fully understand the complexity and the size of the challenges that FINN faces, we first needed to understand how FINN is organized and the different characteristics of each business function.

5.3.1   Organization of FINN

Figure 11: Organizational structure at FINN.

FINN.no AS (Norwegian LTD) consists of five separate AS, one for each business unit, see figure 11. The five AS are Reise, Torget Jobb, Eiendom and Bil. They operate on markets that have different characteristics. Eiendom (Property market) and Bil (Car) for an example competes on a mature, conservative, market where FINN Eiendom has almost 100% market share. Reise (Airfare and Hotels) on the other hand is a market with fierce competition and lots of innovations. While FINN has one overarching strategy for growth, each AS is run more or less independently with their own strategy based on their market conditions. This has consequences for the BI initiative, while some markets mainly need strategic BI other need tactical or

operational. One should also be aware that the culture is different on each market. While some are very open to change, others are not.[159]

5.3.2 Analytical Capability Assessment[160]

After ACA had been conducted the results were analyzed and categorized with a "traffic light" system.

Disagree	Partly Disagree	Partly Agree	Agree
0	1	2	3

Table 3: Answering alternatives and corresponding score in ACA.

The answers in each area of the assessment were given a score according to Table 3. The mean value was then based for the traffic light color, see Table 4. By using a traffic light system the readability of the results increases. The intervals where set to spread the answers even among the three classifications and to visualize and separate roadblocks from areas that are ok. This is a simplification of the truth but necessary to be actionable.

Color	**RED**	**YELLOW**	**GREEN**
Interval	0 – 1,5	1,5 – 1,9	1,9 - 3
Definition	Road block	Risk	OK

Table 4: Intervals for the traffic light system

5.3.2.1 Ability to Align and Govern BI

The response from Management in this part was not enough to draw conclusions that are statistically significant between the different market units. Therefore we present the results of this part of the assessment for FINN as a company, see table 5. We recommend FINN to use it as a base for further discussions.

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[159] Reuterdahl, T. (17/04/09)
[160] To access the raw data (.xls) visit http://www.tinyurl.com/power-of-knowing

Align & Govern BI	1	2	3	4	5
Leadership	⚠	✓	⚠	⚠	⚠
Strategic Alignment	✓	✓	⚠	⚠	✗
Business & IT Partnership	⚠	⚠	⚠	✗	⚠
BI Portfolio Management	✓	✗	✓	✗	✗

Table 5: FINN's ability to align and govern BI

Leadership

Senior management at FINN show passion for the BI initiative, and are starting to demand decisions based on facts from their subordinates. Furthermore, several leaders have experience and knowledge in change management and change implementation.

However, management lacks competence in BI and the CEO does not communicate the importance of a data-driven work methodology extensively. It is also the opinion of management that no senior executive has yet taken leadership of, and responsibility for, the BI program.

Strategic Alignment

Metrics at FINN are based on value drivers and supported by business strategy. Managers at FINN know how to align and unify metrics at strategic, functional, and operational levels of the business. However, projects can still be shut down after a few months with the explanation "*it doesn't fit the strategy*".

Business partnership

The management at FINN understands how IT architecture brings together the organization, processes and information to make better decisions. Furthermore, business understands how to use IT to meet business objectives and IT understands what kind of information that is needed to manage business processes.

The business units at FINN are somewhat prepared to lead the initiative and assume ownership of the delivered technology. IT understands what kind of information that is needed to manage business processes. There are often misunderstandings between business and IT; this could be explained by the fact that Business and IT have problem communicating using the same technical and business language.

BI Portfolio Management

Management at FINN believes the value of their BI projects is certain to exceed the cost. Management believes that the BI projects are linked together and need to be managed as a program, not as a project. The organization has not analyzed processes in a structured manner to identify opportunities where BI can improve performance. There are disagreements whether or not BI projects focus on areas where the risk and potential impact is low.

5.3.2.2 Ability to Leverage BI

Respondents' market unit
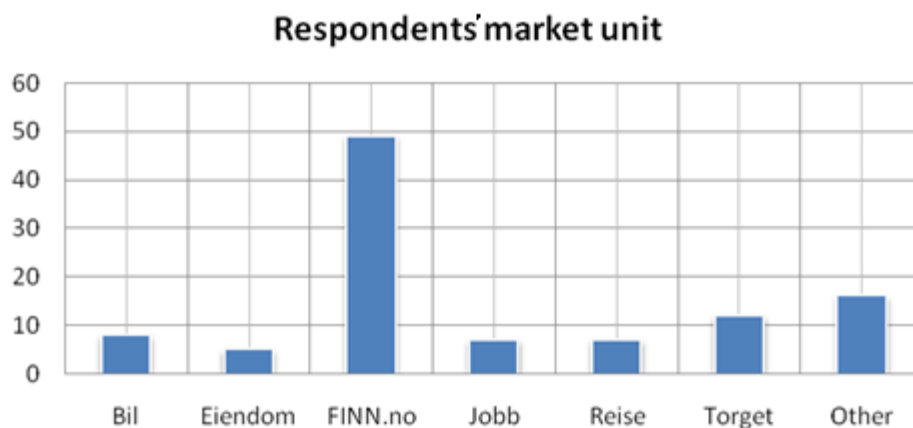
Table 6: Respondents market unit at FINN

This, the second part of the assessment, was sent out to 260 employees at FINN. Out of these 104 people responded, giving a response rate of 40 percent. The respondents' market units can be seen in Table 6. The results from the evaluation can be found in table 7 below.

Leverage BI	1	2	3	4	5
Culture	✓	✓	✓	!	!
Process Maturity	✓	!	!	✗	✗
Continuous Improvement	✓	!	!	✓	!
Decision Process	✓	✗	✗	✗	✗

Table 7: FINN's ability to leverage BI

Corporate Culture

The culture at FINN is somewhat mature and seen as suitable for fact-based decision making. The assessment showed especially that the attitude towards change is good among employees. They accept changes and are open towards it and even see it as a

natural element in their daily work. There is no pride in the company of making decision based on intuition.

FINN has started the process to become more fact-based and some initial data-driven projects have shown success in the company. However, the frequency of conducting experiments is relatively low and needs to be improved. There is a common perception at FINN that the senior management supports a fact-based culture, though the culture is not fact-driven yet.

Table 8: FINN's response to the statement -*Management support a data-driven culture*

As table 8 shows, there are different opinions at the different market units. While most of them are very much the same, Eiendom and Reise stand out; Eiendom because they agree the least that their management supports a data drive culture, while Reise score the highest on this statement.

Decision process

There is an agreement in the organization that leaders at FINN make their decisions based on both intuition and data. At the operational level some of the decisions have been automated. FINN lacks a clear and well-defined decision process and system support to help manager optimize their decisions. Information, assumptions and results of experiments that could be a base for decision are not available to everyone. FINN does not have the ability to do predictive prognoses that can be used to gain strategic insights and to base tactical and strategic decisions on.

Continuous improvement

FINN has a system to spread knowledge within the organization and incentives are in place to use the system. The employees estimate that they are skilled in problem solving and process improvement techniques. Organizational learning and knowledge sharing is encouraged and rewarded. Employees at FINN also look for signs of how they can change their work, and propose managers with process improvements. In some of the company's processes best practice has been identified, but it is not spread in the entire organization which can be visualized in table 9.
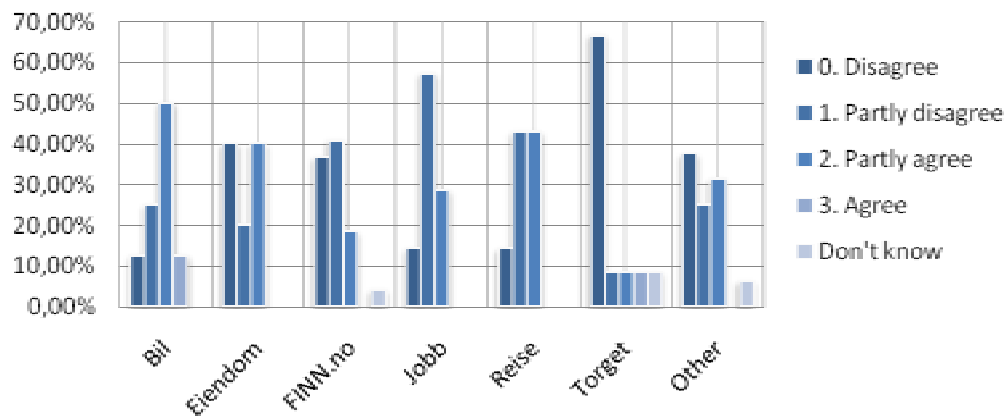
Table 9: FINN's response to the statement - *All processes are designed after best practice*

Process maturity

Processes exist at FINN, but the process maturity is low. Employees can't describe the process' overall flow; how their work affects customers, other employees in the process, and the process's performance. Furthermore, employees lack insight in the required and actual performance levels of the process. There is also a lack of actionable end-to-end metrics for the process, which can be seen in Table 10. A positive aspect is that FINN has a strong customer focus and employees believe that customer focus is important, but it is not clear how this affects the daily work.

The process has actionable end-to-end metrics
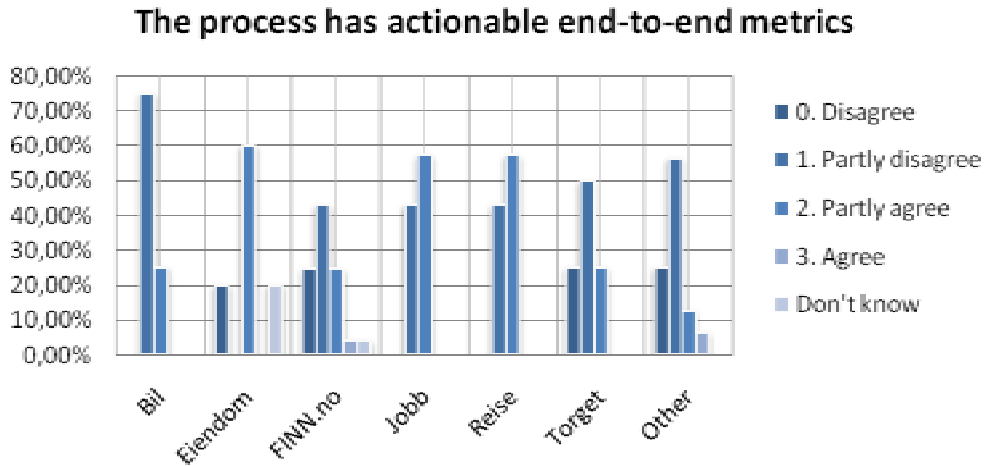
Table 10: FINN's response to the statement - *The process has actionable end-to-end metrics.*

5.3.2.3 Ability to Deliver BI

There are only four IT-architectures at FINN so a quantified analysis can be misleading as there is not enough data to work with. As in the first part, the results from this part aim not to reflect the precise situation but rather to act as a basis for further discussions at FINN. The results from the evaluation can be found in table 11.

Deliver BI	1	2	3	4	5
BI Architecture	🟡	✅	❌	❌	❌
Information Management	🟡	❌	❌	❌	❌
Tools & Applications	✅	✅	✅	❌	❌

Table 11: FINN's ability to deliver BI

BI Architecture

The BI architecture of FINN is characterized by silos and is platform specific. The IT department does not have a plan for how to integrate and deliver BI to the whole organization. Furthermore, the data, structured and unstructured, is not standardized. Although some integration has begun and governance policies do exist, they are not implemented across the organization.

Information Management

Multiple versions of the truth exist. There is no data steward who is responsible to update meta-data when processes or tools change. The data quality is low and so is the confidence in the data.

Tools & Applications

There is a proliferation of tools at FINN. For analysis Excel and historical data is most commonly being used. Metrics are presented on dashboards across the organization.

5.3.3 Workshops

This chapter summarizes the current situation at FINN from a qualitative approach. It's a turbulent time at FINN due to economic uncertainties in the world and they are only in the beginning of their analytical journey.

5.3.3.1 Current organization of BI initiative at FINN

The initial organization of the BI program is four working groups; [161]

- IT is responsible for data aggregation and data quality.

- Marketing & Sales (M&S) are responsible for delivering BI to sales functions at each market and the marketing function.

- Insights & Innovation (I&I) is responsible for product development and innovation.

- The product manager of each AS is responsible to identify their BI need and utilization.

IT

A concrete initiative from IT is the promotion of a senior manager to *data owner*, he is responsible for data quality across the organization.[162] A new IT strategy is under development during the time this thesis is written and will steer how IT will meet the new demands that will come from the BI program.[163]

Marketing & Sales

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[161] Halvorsen-Printzell, C. (17/04/2009)
[162] Ullereng, O. (27/01/2009)
[163] Anderssen, L-E. (16/03/2009)

M&S have made several initiatives so far, including the development of a three year plan. Their strategy is to go wide and try to achieve as much as possible. The first action is to implement a standard sales process across FINN and to serve the markets with basic reporting. Common approaches to new initiatives at FINN have previously been *launch and learn*, however the learning part has often been forgotten. M&S have identified three problems:[164]

1. Lack of availability – A pull exists from business but the information is not available.

2. Low competence – Only a few employees have sufficient knowledge in BI tools, limitations of the data and IT insight. The analysts need to be able to communicate with both IT and business users. Personnel at the markets have themselves implemented some tools, sometimes with results that were completely wrong.

3. Ability to implement – The percentage of successful implementations is too low.

Insights & Innovation

I&I have had a different approach than M&S. The project leader at I&I, Mr. Oppegaard, have conducted interviews with twelve leaders and product mangers from all markets to identify common needs and to establish a consensus of what problem BI should solve.

The conclusions from Mr. Oppegaards' interview rounds are;[165]

1. Analytics is a tool to achieve a greater cause and should not be a goal itself.

2. There is no consensus regarding what business challenges analytics should solve. However, there are many ideas of what analytics could solve.

3. There are many opinions of what analytics is, and a common definition of the term is lacking.

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[164] Ullereng, O. (17/04/2009)
[165] Oppegaard, B. (17/04/2009)

Furthermore, Mr. Oppegaard asked *"Where will it benefit FINN the most to focus on analytics?"* during his interview-round. A summary of the answers are presented below;[166]

- At Bil we could achieve quick results. Initiatives at Eiendom and Reise will also result in financial gains immediately.

- Product development process; each review should be measured and compared with previous releases.

- The executive management team is a natural start; it sends out signals of importance to the rest of the organization.

- To identify emerging trends on the net in large; use of services et cetera.

- Use of analytics to measure the effectiveness of classified ads and banner advertisements at FINN. This in turn could be used as arguments for the sales force.

- Use of analytics to make better prioritizations and to increase transparency and visualization of decisions.

- To define the customer value proposition.

There is also a wide-spread concern that by being data-driven it will take too much time to make decisions.[167] Furthermore, a common saying is that FINN has plenty of insights from data that it is not being used; this is explained by lack of availability.[168] The information is trapped in silos and the data warehouse.

5.4 Analysis

In the current economical crisis (spring of 2009) overall IT budgets are tight and risk aversion tends to be higher than normal. We, the authors, have heard from employees that there previously has been a similar BI project at FINN a couple of years ago which failed and somehow faded away. Our impression is that this time everyone at FINN is eager to make it right. A number of smaller BI projects have already started with some success. We believe that analytics may very well be the key to the future, but there are some black clouds on the sky that must be managed with caution.

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[166] ibid.
[167] Oppegaard, B. (17/04/2009)
[168] Ullereng, O. (17/04/2009)

5.4.1 Strengths

The following factors and strengths have been identified that will make FINN's transition to an analytical competitor easier and should be leveraged accordingly.

- FINN has top management support for the BI initiative. This was identified as one of the critical success factors in part I and according to many experts, the most crucial one. With senior management support FINN can move quickly to higher maturity levels.

- Managers at FINN have identified several areas where they need and want more information to make better and more accurate decisions. This indicates a pull from business and increases chances of success. By imitating analytical competitors FINN can identify even more analytical opportunities, and in an innovative company as FINN managers will most probably invent new ways once they get started and see the possibilities.

- ACA clearly shows that employees at FINN are open for change and that the ability to manage change is good. In order for a change management project, like this BI program, to be rolled out smoothly and successfully, employees must be open to change.

- FINN has already initiated a number of small-scale BI initiatives with some success; this is great and can be used in political discussions about BI funding and scope. Furthermore, this should be leveraged to get traction in the organization.

- There are two web analysts at FINN armed with professional tools and massive amounts of web data, ready to tackle the challenges and to do their part of the BI program. The web is suitable to start with due to the large amounts of data and low implementation costs. Investment in more advanced platforms for segmentation of visitors for experiments should be considered to make it possible to perform more advanced experiments.

- The assessment shows that there is a clear focus on customers and website visitors at FINN. Customer centricity was one of the identified common denominators in the best practice analysis and a key element for new designs and innovations.

5.4.2 Weaknesses

There are also some threats to the BI initiative that has been identified, which can become roadblocks and must be managed to avoid the risk:

- There is no overall consensus of the definition and concept of BI and what BI should support at FINN. Before implementing BI, workshops must be held and information spread across the enterprise. To maximize impact BI should support the company's distinctive capability, which hasn't yet been defined at FINN.

- Low competence in the limitations of BI, today FINN has no employees that are pure statisticians or data miners. A lack of insights in the limitations of an analysis is dangerous and must be fixed immediately; either by recruiting a BI professional or by using external consultants. Is the analysis a statistic anomaly, a wrong join in the data warehouse or actually a potential gold mine?

- There is a lack of insight at FINN of the required levels of IT involvement in the BI initiative. Our conclusion is that IT has not been involved sufficiently. This could jeopardize the project timeline and should be adjusted as soon as possible. Low IT involvement affects the ability to deliver BI and could be a bottle neck of what can be achieved with internal transaction data for some time ahead.

- FINN lacks a well-defined decision making process. A prerequisite to turn insight into action is a well defined and established decision process.

- The low process maturity will affect the implementation of data governance initiatives and will make it more difficult to establish end-to-end metrics and KPI's.

- According to the survey, and mentioned previously as strength, there is a strong costumer and visitor focus at FINN. However, at the same time there's a low insight of how to use it in the daily work. We believe that training of employees in how to use analytics and customer insights in their daily work is necessary to enhance the benefits of this advantage and take it further.

- Experiments are only conducted in small scale. In order to become more analytical and to base more decisions on data, FINN needs to start working more with experiments and establish an experimental culture. As identified in part I of the thesis, companies that are classified as analytical competitors perform hundreds of experiments every day.

5.4.3 FINN's analytical maturity level

Align & Govern BI	1	2	3	4	5
Leadership	⚠️	✅	⚠️	⚠️	⚠️
Strategic Alignment	✅	✅	⚠️	⚠️	❌
Business & IT Partnership	⚠️	⚠️	⚠️	❌	⚠️
BI Portfolio Management	✅	❌	✅	❌	❌

Leverage BI	1	2	3	4	5
Culture	✅	✅	✅	⚠️	⚠️
Process Maturity	✅	⚠️	⚠️	❌	❌
Continuous Improvement	✅	⚠️	⚠️	✅	⚠️
Decision Process	✅	❌	❌	❌	❌

Deliver BI	1	2	3	4	5
BI Architecture	⚠️	✅	❌	❌	❌
Information Management	⚠️	❌	❌	❌	❌
Tools & Applications	✅	✅	✅	❌	❌

Table 12: FINN's aggregated view of the results from ACA.

In table 13 the aggregated results from ACA is summarized. FINN is either at level one or two in most areas. We, the authors, think that the aggregated view of ACA gives actionable directions of necessary actions at FINN. One can easily see that FINN must invest in; (1) strengthening the partnership between business and IT; (2) increasing process maturity; (3) information management. These investments should be carried out while leveraging the favorable culture at FINN and increasing the utilization of the wide variety of analytical tools and applications that exist today.

Comparison with maturity models

To validate the results of the survey, one can compare FINN's strengths and weaknesses with the descriptions of the different levels of information maturity described in chapter 3.1.2. To the authors it is clear that FINN is somewhere between level one and two in IBM's information maturity level and on level two when comparing the results with Davenport & Harris descriptions of their levels.

FINN have started with some basic search, reports and analytics, as well as automated some decisions, all of which are characteristics for the first and second level. Some of the major reasons why FINN isn't strictly a level two company are that there is a limited enterprise data visibility, which result in a feeling of information overload, and that hindsight and intuition are still the base for many decisions. From a technical stand point the IT infrastructure is seen as to some degree monolithic and platform specific. There is also a lack of common definitions of key data and multiple versions of the truth exist. Managers at FINN are heavy users of spreadsheets for analyses and only a limited set of user use professional reporting tools such as business objects or webtrends. Most data are stored in silos with insufficient formal training of users and accessibility.

A step-by-step road map will be presented further in part III, where we will present how and when the identified strengths and weaknesses should be dealt with.

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Part III

Conclusions:
Road map towards Analytical Excellence at FINN

6 Conclusions – Road map towards Analytical Excellence at FINN

Prediction is very difficult, especially of the future.

Niels Bohr, 1885 -1962

In this chapter we have merged our findings from part I and part II to make recommendations for how FINN should proceed along the long and curvy path towards analytical excellence. These recommendations are summarized in figure 12. The basis for the discussions on how to build the road map comes from interviews in part one, with FINN's goals, resources and capabilities in mind. The results from the assessment in part II are seen as identification of weaknesses that needs to be managed and as strengths that should be leveraged to maximize probability of success. We have chosen not to set a timeline on the activities, there are two reasons for this; (1) We have no input from part I on how long time this should take according to best practice; (2) the length of a project or program is dependable on factors that we cannot control such as politics, budgeting, concurrent projects et cetera. However, we do recommend FINN to achieve tangible results within twelve months which is in line with what we've seen both in practice and in the theory.
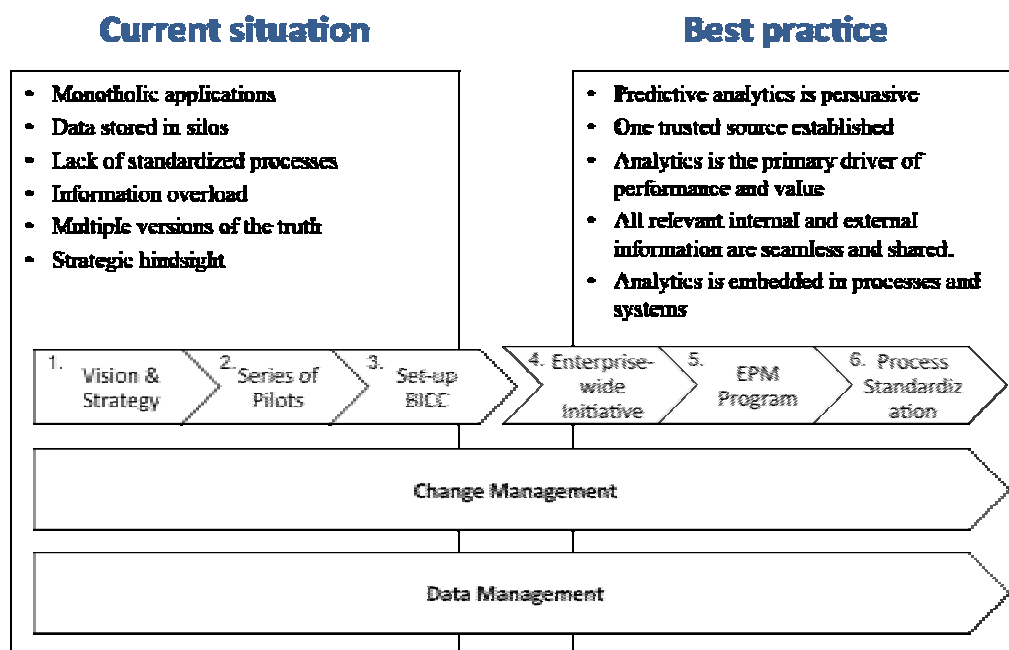
Figure 12: Road map for FINN to enhance their analytical capability.

6.1 Road map – Phase 1 – Step by step

Phase one is what we believe FINN should focus on and accomplish during the first two years.

6.1.1 Step 1: Establishment of vision and goals

FINN needs to begin to establish a vision and goal for the BI initiative, both at a corporate level and for I&I. Questions that needs to be answered are typically; *How will this investment make FINN more competitive? What kind of information does FINN need? What key decisions needs to be backed up with insights? What drives the financial results?*

This work is important; FINN needs to take a comprehensive and strategic approach to BI. FINN must address technology as well as people, processes and the organizational culture. A lack of strategy will result in inconsistent BI deployments. Furthermore, it will make it difficult to implement and support BI initiatives that span over multiple markets. It is important that the BI strategy has an owner and support from the executive level. The BI program must also have metrics that can be measured, monitored and communicated easily; these goals should be realistic but challenging to reach and at the same time contribute significantly to bottom line.

The biggest mistake that analysts make is that they show page-views and average time on site and other bullshit, and no one cares! You have to make it about money.

-Avinash Kaushik, Google

Due to the different characteristics of FINN's markets goals and strategies, the BI program goals need to be adjusted to their specific conditions. On more mature markets; such as Eiendom and Bil, BI might be more suitable for optimization and cost savings. While Reise and Torget, which are less mature, may use BI to increase revenues. The wide span of needed activities is a challenge and a reason why BI should expand in scope slowly when FINN is ready to do so.

Risks

From interviews and literature studies we have seen that it is common that BI initiatives lose traction in the organization after a while if no concrete results have been achieve and can be showed. People may think that there are always more urgent

things to spend budget resources on; Marketing, Sales, and R&D are commonly seen as more important. To be able to justify BI spending and to increase funding, BI must be able to show a ROI that is greater than that of other initiatives. If the goals of the BI program are too ambiguous or if the effects of the program benefits are absent, there is a risk that BI will decrease its support in the organization.

6.1.2 Step 2: Conduct a series of focused pilot's

From best practice studies in part I, one of the major conclusions were to start BI with a narrow focus and then increase scope after some initial success stories been made. Although the scope is narrow, the solutions made should be scalable to be able to reuse the solutions in other projects. FINN has enough management support to start with an enterprise-wide initiative, but we recommend a pilot due to low competence in BI and limited experience from BI projects. Empirical findings from part I indicate that there are synergies with lean. Lean is currently being rolled out in FINN and to roll out BI and lean in parallel processes could be beneficiary. If the steering commité finds this to demanding we think that BI could benefit from following in the backwater of successful lean pilots.

When choosing a suitable pilot, FINN should check the following control points;

- Find a passionate business champion

- Choose a case that will clearly affect the bottom line

- Assure the project its driven by business need

- Assure that the right data exists, both right amount and quality

- The pilot must be able to achieve visible results within twelve months

- The results must be easy to evaluate and communicate to the rest of the organization.

First pilot at FINN

Eiendom has been mentioned several times at FINN as a probable candidate for the pilot due to synergies with other initiatives. To identify the most promising opportunity at Eiendom; we recommend FINN to identify value drivers and KPI's and analyze how these can be supported by analytics, see figure 13. This approach reassures strategic alignment and if the initiative improves the performance of the chosen KPI it will affect bottom line. Other benefits of this approach are increased strategic insight and understanding among employees of what drive profits.
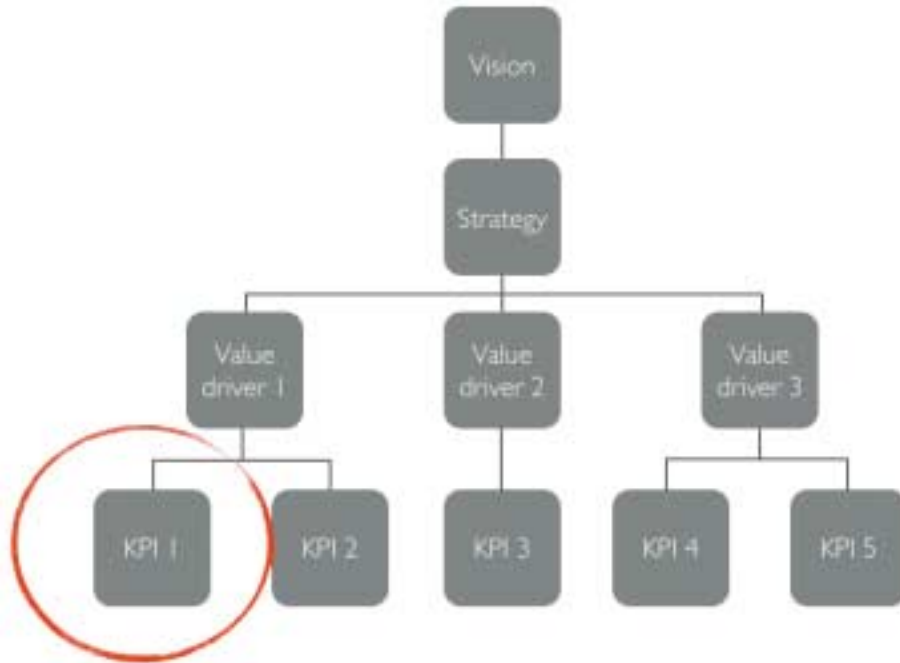
Figure 13: Identify the KPI that will benefit from analytics the most.

Implementation

Analyze whether or not FINN should perform the technical and analytical aspects in-house. Outsourcing to India is common in the industry, deployments in the cloud is also beginning to gain traction. The most important part is to have employees internally that can ask the right questions; not people that prepare data and perform the regressions. Initially external consultants might be necessary to help staff identify the right questions and come up with new ways to look at things.

Risks

Risk factors to consider are that there is no consensus at FINN of what BI is and what it should do. Therefore there is a high risk that the initiative is considered a failure, since the expectations are so different. Stakeholder management and excessive communications of goals and metrics are vital. Before proceeding with an enterprise-wide initiative evaluate whether the organization has enough knowledge and management buy-in to proceed or if another pilot is needed.

6.1.3   Step 3: Setup a BICC

A wide support of analytics exists at FINN, but there's a lack of a clear understanding of what it means and the competence in this area is low. In part II we identified that business and IT partnership should be intensified, which can be accomplish by organizing the BI program in a BICC. The role of the BICC is to spread best practice in the organization and to build skills. Analytics is knowledge intensive and it is important to have employees that know the limits of the presented analysis and what can be done with the data. Furthermore, the BICC should chose tools and technologies and prioritize which projects that should be initialized. Gartner recommends the establishment of a BICC and see it as is a critical success factor for BI.[169] Lack of common standardization of methodologies, definitions, processes, tools and technologies at FINN will lead to inefficient utilization of BI.

Define scope and strategy

Our recommendation is that FINN establishes a BICC with fully operational responsibilities for development and provides BI solutions as a service to business units. The need of external competence with deep knowledge in setting up BI environments and integrating information sources should be considered. The BICC should have a multidimensional approach and don't focus too much on one dimension. It should leverage technology, skilled people, transparent and efficient processes, and a culture that fosters fact-based decision making to turn FINN into an intelligent enterprise.

> *"You can be successful without a BICC, but you absolutely will not fail if you have an effective BICC."*
>
> - Donald Feinberg, VP Gartner Information Infrastructure group.[169]

Implementation

Make a detailed plan for the implementation of a BICC for the coming twelve months and then plan activities for another two years with less detail. The long-term planning later used to base budgeting and staff allocation projections. Furthermore, it makes it easier to start discussions when first pilot is completed and the next step should be taken.

Risks

FINN need to make sure that there is no overlap or redundancy between I&I and S&M, instead try to integrate and consolidate resources. The BICC can be seen as a

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[169]Intelligent Enterprise,
http://www.intelligententerprise.com/showArticle.jhtml?articleID=215801184, retrieved 20/04/2009

joint venture between business and IT and it's important that FINN assures that the goals of IT and business are aligned. This is usually a big change for IT which usually has goals associated with utilization, up-time and other cost-oriented goals. The scope of the BICC must be clearly communicated to avoid misunderstandings and turf battles.

6.2   Parallel processes

In parallel with the steps above change management and data management must progress.

6.2.1   Change Management

In order for the organizational changes to get traction in FINN, a proactive plan for effective change management must be developed. This should, to achieve best results, be done as a parallel process to the other activities of the road map. This will gain most affect out of the initiative and minimize the risks of the both identified and unidentified obstacles that may be in the way for the BI program.   These recommendations are based on Kotter's eight steps to achieve a successful change management project.

Step 1: Establishing a sense of urgency

In today's economy one may think that the sense of urgency exists in every organization. However this can't be taken for granted as for the transformation program to get started, it requires the aggressive cooperation of many individuals. Without motivation, people might not help and the effort goes nowhere. Bad business results are both a blessing and a curse when managing a major change. The positive side is that people normally pay attention when the company is less profitable or losing money. The negative is that new project are more difficult to fund and it can be hard to get resources to make the change. Late in Mars 2009, FINN had to shut down a subsidiary and lay of 25 percent of FINNs total staff. FINNs' owner Schibsted ASA has also been hit hard by the economic downturn. This can be used to create the cooperation and sense of urgency needed for change. Examples of how competition is using analytics can also be a motivational factor.

Step 2: Creating the guiding coalition

The guiding coalition is a strong group with enough power to drive through change, expertise and credibility so that the recommendations from the group are taken seriously; finally the group has leaders with proven ability to drive change.   The guiding coalition has not been established yet, but we recommend that it's powerful enough to drive through change.

Step 3: Developing a vision and strategy

This is the first step in the road map above; a sign of a good vision is that it can be communicated to someone in five minutes or less, and get a reaction that signifies both understanding and interest. It should be a clear and compelling statement showing where the change is leading. By clarifying the general direction for change it simplifies hundreds of more detailed decisions and it motivates people to take action in the right direction. Without a clear vision there is a risk that employees either get confused or alienated. In part two the authors identified the lack of a common vision as a potential risk. Writing long memos or making people read thick fact books rarely inspire for change, they probably have just the opposite effect. Remember that a vision is a sensible and appealing picture of the future, not the logic for how it can be achieved or specific steps and timetables.

Step 4: Communicating the change vision

It is essential that the company's vision gets communicated and gains understanding in the enterprise. Employees will not make sacrifices, even if they are unhappy with the current status, unless they believe that useful change is possible.

To avoid the risk of losing the change vision in clutter FINN should use all their means to spread it thru the entire company. We have identified five channels that should be used to communicate the change vision:

1. On *Allmötet*, FINN's monthly meeting for all employees is a good place to communicate and to reach out. This is also a place where employees can ask questions regarding any obstacles or concerns they may feel, and vision can be discussed and explained.

2. Use the screens and dashboards located in the company to communicate the vision are good reminders for the employees.

3. Turn the monthly newspaper at FINN, *Glaskulan*, into lively articles about the vision, to explain the change, why it's needed and how the change will affect the company.

4. Communicate to external parties that FINN is putting resources to enhance and improve their analytical capability, for an example in newspapers and financial reports. This will show the employees that this is something that FINN takes seriously.

5. Turn board meetings at FINN into exciting discussions of the transformation.

The principle in this step is simple; use every possible channel, especially those that are being wasted on nonessential information, to communicate the change vision. And remember to walk the talk; leaders base their decisions on information and less on gut feeling and they require their staff to do the same.

Step 5: Empowering broad-based action

For the transformation to be successful, more people should be involved as the process progresses. When actions are aligned with the overall vision, the more people that are involved the better and greater will the outcome become. However, renewal of processes and change in work descriptions requires removal of obstacles and barriers to allow the change to take place. To achieve this we recommend three steps:

1. Assure that the formal structure at FINN doesn't make it hard for employees to act according to the change.

2. Managers should create incentives and reassure that the compensation or performance-appraisal systems for their staff encourage actions that aims to implement the new vision.

3. Train employees in necessary analytical skills, make it a part of *FINN skolan* and integrate it in management development programs.

Step 6: Generating short-term wins

This is the second step of the road map. When the pilot project creates wins it provides evidence for employees at FINN that the change is for the better. As real transformation takes time and there is constant a risk of losing momentum for the renewal if there is no short-time goals to meet and celebrate.

Step 7: Consolidating gains and producing more change

Success should be communicated in all possible ways, but don't make employees feel too comfortable there is still a long road ahead. Continue to feed the sense of urgency and continue to follow the steps in the road map. This will lead to the achievement of more and greater gains. As time goes, processes will mature at FINN and the analytical capability enhances. The guiding coalition uses the credibility afforded by short-term wins to tackle additional and bigger change projects. FINN should now proceed to third step of the road map, setting up a BICC. More people are brought in, promoted and developed to help with all the changes. This will let FINN go after systems and structures in the company that are not consistent with the new vision and that couldn't be confronted before.

Step 8: Anchoring new approaches in the culture

Cultural changes take time and effort and it is easy to slip back to old habits; FINN is a relative young company which could be an advantage to achieve major changes successful. New norms and values need to be revaluated and communicated across the enterprise. To deeply change a company's culture is a process that can take several years, as new approaches are fragile and subject to regression.

6.2.2 Data Management

Before FINN can make sense of the data and start using it to deliver business value, they need the technical ability to consolidate data, deliver the information and use BI applications. In this thesis the authors have emphasized the role of leadership commitment and business pull; however, data is the fundamental building block for BI, like the foundation of a house, and it need to be reinforced by reliable data and data governance; both absent at FINN today. Without high data quality and relevant data the initiative will inevitably fail.

Data management is about improving data quality and to design and enforce data governance policies. Data governance policies are the rules for structuring, storing, retrieving and indexing the data. It is important to build trust so that the end user can act on the data. Without sound data governance FINN will struggle with inconsistencies and problems with duplicates until end-users give up and go back to normal. Data management is a technical risk since transactional data at FINN is stored in monolithic applications with little or no documentation of meta-data. Key data entities have not been standardized and documented; several versions of the truth exist. To sort this out will take time and it is therefore suitable to start with web data and external data. Implementation of Webtrends (a professional web analytics tools) and tagging of the site is implemented and gives a rich source of web data that can, and is already to some extent, be used to deliver business value.

Since data management it is not organized by I&I we will only present some general guidelines to give an overview. We want to remind the reader that in part I we concluded that data quality is an ongoing process and it is not an IT-problem. It is in everybody's business and interest to maintain a high level of data quality. However, the actual planning and implementation should be handled over to the pros on sixth floor. We believe that the guidelines from IBM (Walenta) are suitable to repeat:

1. **Enterprise data architecture program** – Start with documentation of the current landscape, then define a target Service Oriented Architecture-enabled architecture, and a road map indicating how to migrate to that architecture from the current environment.

2. **Trusted data sources must be established for enterprise-critical data** – This becomes a major challenge when ownership of data is fragmented in many areas, when there are multiple sources for the same data (each with its own unique definition), when existing data is undocumented and tightly coupled inside applications.

3. **Information must be integrated** – The main contributor to this challenge are platform dependencies, organizational issues, tight coupling with business processes, and lack of business data standards and an enterprise data model to define an explicit relationship among entities from multiple domains.

4. **Data quality must be improved** – This is a major challenge in any enterprise with a large amount of data in which data fields are not standardized, multiple ways of capturing the same data are used, and data is copied in many places.

5. **Skills** – A program to train employees and develop the critical skills that are needed in the data area to implement and maintain the enterprise data architecture program.

The next step is to integrate web data with competitive intelligence data and internal data, this is something even best practice companies are struggling with, but when it is accomplished some truly innovative products or services can be implemented.

6.3 Road map – Phase 2 – Step by step

Step four to six are activities that we think FINN should implement in a longer perspective. Change takes time to settle, and the suggested changes are significant and must be given time to anchor and mature.

6.3.1 Step 4: Roll out the BI program enterprise-wide

When the maturity of the BICC has become acquired enough skills, experience and organizational buy-in; IT infrastructure is integrated; data quality, and the confidence in the data, is high; then it is time to roll out the BI program to the entire organization. We see this as a three to five year objective.

6.3.2 Step 5: Initiate an Enterprise Performance Management Program

As the organization progresses along the road map and measuring and optimizing becomes a way of life at FINN the need of end-to-end metrics and KPI arise. The purpose of the EPM program is to establish process and enterprise KPI's that link tangible and intangible resources. This will align actions with corporate strategy and guide decisions and the selection of new projects and investments. It is very rare for companies to accomplish this. One example that we have come across, and presented in part I, is at Best Buy. They are able to measure the effects on sales if employee engagement rises. Second-guessing is not necessary when you have the data and can plot the regressions. This program can be lead by the CFO and the BICC to combine business and economical insights with competences in BI.

6.3.3 Step 6: Process and decision process standardization

From conducted assessment we concluded that the process and decision maturity at FINN is low. This is definitely a risk and managed by gradually do the implementation and improvements in the pilots. When looking over the horizon we do recommend FINN to become more process-oriented to leverage analytics and become world class in its industry.

7 Theoretical contribution and general reflections

You cannot solve the world's problem in one discussion, not even while drinking beer.
Program Manager at IBM with more than 28 years of experience in BI

7.1 Theoretical contribution

The theoretical contribution from this thesis consists of two main parts; (1) ACA - Analytical Capability Assessment framework and (2) common denominators between companies that successfully compete on analytics.

7.1.1 ACA framework

The ACA framework, presented in chapter 3, is an evolvement from Williams & Williams' seven areas and three critical capabilities for BI success. The capabilities are (1) Ability to align and govern BI; (2) Ability to leverage BI; (3) Ability to deliver BI. The authors of this thesis have added two areas to the first two capabilities; Leadership and Process Maturity and redesigned the third capability, Ability to deliver BI, which also have become more detailed than it was originally in Williams & Williams' framework. This created a

7.1.2 Common denominators

In chapter 4, Establishing Best Practice of Analytics, common denominators between companies that successfully compete are identified. These denominators are the result of studies of companies in many different industries and can therefore be seen as general for many businesses. The denominators can be summarized into;

1. Focus, Focus, Focus
   - Affect bottom line
   - Start small, think big
   - Identify Business Champion
2. Leadership
   - Support, and use, the system
   - Change Management
   - Bi initiative must be a pull from Business
3. Corporate Culture
   - Experimental culture
   - Lean philosophy

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- Process for decision

7.2 Suggested areas for future research

There are many interesting aspects that could be studied further. After this thesis we have three questions, or areas, that we would look into further if we had the opportunity:

1. Study the relation between processes maturity and the use of analytics.

2. Decision making; quantify the costs and benefits of being data-driven.

3. What happens next, how are Google, Amazon, Netflix and Capital One doing in 1 year, 3 years or 10 years? What will happen when the extraordinary profits decreases, will customer centricity still prevail or will these companies need to focus on short term wins?

This thesis has been written with SCRUM methodology, commonly used in software development projects. This has been an interesting experiment; it forced us to think of the end result from the very beginning. We believe that it has increased our effectiveness and it's been easier and more motivating to write since you can focus on areas that interest you at the moment. One negative aspect that we see is that it's been difficult to share our work at FINN since the chapters aren't 100% complete until the very end of the thesis. Our experience is that the advantages of SCRUM (agility and efficiency) have easily out-weighed the disadvantages (difficult to share incomplete material). By communicating the process more clearly to the stakeholders this disadvantage could have been avoided completely.

7.3 Validation of the thesis

We, the authors, have had several checkpoints during the work process of the thesis with our tutors at the university and at Accenture to ensure a high validity. They have helped us to ensure that the used theories and the empirical studies have been a good foundation to draw conclusions and to make sure the findings to be both relevant and valid.

The external perspective of validity is to what degree the conclusions of the thesis can be generalized. As mention above in the discussion of theoretical contribution, two main parts are general and can be of interest for other companies that want to become more data-driven. These are the ACA framework and the common denominators among leading players. As for the roadmap in chapter 6, it is specific designed for FINN but can of course serve as an inspiration for other companies as well. Academically, researchers within the fields of BI and analytics could find definitions and related findings in best practice as well as the ACA framework to be useful.

Concerning the reliability of the thesis, there was, as mentioned before in chapter 5 some problems with miscommunication when performing the ACA framework at FINN. However, we believe that the ACA framework gives reliable results or at least, it creates a good ground for further discussions. The chosen approach for the thesis, to use a SCRUM methodology, do we believe has increased the overall reliability of the thesis and its findings.

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Appendix I: Presentation of Interviewees

Andy Moeck and Diana Krupa, ADISN

Andy Moeck is the founder and CEO of ADISN and Diana Krupa is the Vice President Sales. ADISN is a company working with relationship-based targeting, the next generation of digital ads that uses relationship data from the social web to increase segmentation targeting.[170] In December 2008, New York Times wrote that ADISN's technology could cause a shift in the advertising world.[171] The company raised more than 1.5 million dollars in venture capital in 2008 and was also one of the winners in the category *Online advertising and service providers* at AlwaysOn.[172,173] Prior founding ADISN Mr Moeck was one of the co-founders of Teleo, a peer-to-peer telephony network that was acquired by Microsoft in 2005.

Avinash Kaushik, Google

Avinash Kaushik is the author of the recently published book *Web Analytics: An Hour A Day* and the highly ranked blog on analytics *Occam's Razor* (www.kaushik.net/avinash). Mr. Kaushik is currently working for Google as Analytics Evangelist. He is also the co-founder and Chief Education Officer for Market Motive, a company working with education in internet marketing. He is on the Board of Advisers for University of California Irvine and on the board at several companies working with analytics and insights.[174,175]

Christian Walenta, IBM Enterprise Business Information Center of Excellence

Christian Walenta has more than 20 years of professional experience in information management, business development, project management and data warehousing at IBM. The company had a turnover of 98.8 billion dollars in 2007 and more than 386 000 employees.[176] Mr Walenta is currently in a Senior Advisor role to the Enterprise Business Information organization and has been a recognized leader in

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[170] http://www.adisn.com/aa.html, retrieved 16/03/2009
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Information Management at IBM. Prior to this role, Mr Walenta lead IBM's Enterprise Information Management Office, responsible for providing strategy and programs for information management and Data Governance at IBM. In 2006 Mr Walenta got an Outstanding Innovation Award from IBM for his achievements in Information Management.[177]

Don Healy, IBM

Mr. Healy is the program manager of the Enterprise Business Information Center of Excellence project office. This project office is a matrix team of subject matter experts with backgrounds in data architecture and modeling, information management best practices, and business intelligence solutions. The focus of this new project team is to provide consulting perform services that will improve the maturity of IBM data management. He brings 28 years of IBM experience in large systems, software business planning, pricing, and IT strategy to this role.[178]

Jeanne G. Harris, Accenture

Jeanne G. Harris is the co-author, with Thomas H. Davenport, of the book *Competing on Analytics: The New Science of Winning*. Ms. Harris is also Executive Research Fellow and Director of Research at the Accenture Institute for High Performance Business where she leads research in the areas of information, technology and strategy. She has more than 30 years of experience and has led Accenture's business intelligence, analytics, performance management, knowledge management, and data warehousing consulting practices. Her work has been published in numerous business publications, including Harvard Business Review and Sloan Management Review. Her research has been quoted extensively by the international business press, including the Wall Street Journal, the Financial Times, Forbes Magazine, CFO Magazine, CIO Magazine and Computerworld.[179]

Michael Chui, McKinsey & Co

Michael Chui is a Senior Expert and Senior Manager at McKinsey. He is responsible for directing research on the impact of technology on business at the McKinsey Technology Initiative. McKinsey is one of the world's leading firms in management consulting services. Prior to joining McKinsey, Mr. Chui was the Chief Information Officer of the City of Bloomington, Indiana.

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Per-Kristian Halvorsen, Intuit

Dr. Per-Kristian Halvorsen is the CIO, Chief Innovation Officer, and Senior Vice President of Intuit. The company has 8 200 employees and had a turnover of 3.07 billion dollar last year (2008).[180] Prior to joining Intuit, Dr. Halvorsen was Vice President and center director at HP Labs where he led the effort to establish HP Labs India and China. He has been a professor at the University of Texas at Austin and the University of Oslo and a consulting professor at Stanford University. He has served on the board of directors of Symantec and on the United States' National Academy of Sciences Committee on *Internet Navigation and the Domain Name System*.[181]

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Appendix II: ACA Questions

Ability to Govern & Align BI

	Nivå 1	**Nivå 2**	**Nivå 3**
Leadership	Managers request basic data to perform their work.	At least one manager with a strong position in the organization has realized the benefits of BI.	Senior management show passion for the BI initiative, and start to demand decisions based on facts from their subordinates.
	Reports are based on spreadsheets and used ad-hoc.	Managers begin to request more advanced reports.	A senior executive has taken leadership of, and responsibility for, the BI program.
Strategic Alignment	Projects can be shut down after a few months with the explanation *"it doesn't fit the strategy"*.	Every business function has stated goals and defined measures of success.	Metrics are based on value drivers, supported by business strategy.
	BI projects focuses on areas where the risk and potential impact is low.	BI initiative support the company's metrics, but an end-to-end connection between these are missing.	The metrics are align and unify at strategic, functional, and operational levels of the business.
Business & IT Partnership	Business order reports and analysis but are seldom active in the development process.	Business understands how to use IT to meet business objectives.	The business units are prepared to lead the initiative and assume ownership of the delivered technology.
	There are often misunderstandings between business and IT.	Business and IT can communicate using the same language and mindset.	IT understands what kind of information that is needed to manage business processes.
BI Portfolio Management	The value of BI is certain to exceed the cost.	The organization analyzes processes in a structured manner to identify opportunities where BI can improve performance.	The BI projects are linked together and need to be managed as a program, not as a project.

Ability to Govern & Align BI

	Nivå 4	**Nivå 5**
Leadership	Senior management has competence in BI.	The CEO communicates the importance of a data-driven work methodology.
	Several leaders has experience and knowledge in change management and change implementation.	The CEO continually invests in BI initiatives.
Strategic Alignment	Corporate strategy and BI strategy are aligned.	The organization continuously develops new metrics that span across the organization.
	BI projects has large impact on bottom line and continuous to deliver good ROI.	Regression analysis is used to determine the affect of intangible assets on bottom line.
Business & IT Partnership	Management understands how IT architecture brings together processes, information and the organization, to make better decisions.	Business understands how it affects timelines and implementation of BI.
	IT supports business processes, not business units.	The IT organization effectively supports changing business requirements.
BI Portfolio Management	The organizations have an *"opportunity map"* over possible BI projects and choose which to implement based on risk and ROI.	BI is managed as a portfolio of investments, optimized based on potential revenue, risk and available resources.

Ability to Leverage BI

	Nivå 1	**Nivå 2**	**Nivå 3**
Culture	Employees partly accept to change how work is performed.	Employees are open to change in how work is performed.	Employees are prepared for significant change in how work is performed.
	The culture takes pride in making decisions based on intuition.	Initial data-driven projects have shown some success.	Senior management support a fact-based culture.
Process Maturity	Some processes exists in the company.	There is a process owner, who is formally in charge of improving the process's performance.	The process owner identifies and documents the process and communicates it to all the performers.
	No process owner is in charge and a lack of holistic view regarding processes exists.	Customer focus is important, but it is not clear how this affects the daily work.	The organization has a strong customer focus.
Continuous Improvement	Organizational learning and knowledge sharing are encouraged and rewarded.	Employees look for signs that the processes need change and they propose improvements to the process.	We have a system to spread knowledge within the organization and incentives are in place to use the system.
	Best practice has been identified for some processes within the organization.	The organization has identified best practice for most of the processes.	All processes are designed after best practice.
Decision Process	Decision making in the organization does not have a process.	There is a defined formal process for decision making.	The decision making process is transparent; Facts, experiments and assumptions that are the base for the decision is available for everyone.
	Decisions are based part on intuition and part on data.	There are processes and systems to support operational decisions.	Key decisions are followed up and evaluated.

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Ability to Leverage BI

	Nivå 4	**Nivå 5**
Culture	Large parts of the organization have a fact-based culture.	Employees regard change as natural.
	Experiments are a natural part of how work is conducted.	Employees continuously challenge their knowledge about customers through experiments.
Process Maturity	Employees can describe the process's overall flow; how their work affects customers, other employees in the process, and the process's performance; and the required and actual performance levels.	The process has been designed to fit with customer and supplier processes in order to optimize interenterprise performance.
	The process has actionable end-to-end metrics.	Senior management regularly follow up on the process KPI's and goals, and uses these in their strategic planning.
Continuous Improvement	Employees are skilled in problem solving and process improvement techniques.	In all parts of the organization there are several experiments with a focus to optimize processes running.
	The processes are based on the industry's best practice.	Objective players have identified some of the organizations processes as best practice.
Decision Process	The organization uses advanced algorithms to make predictive prognosis.	Strategic insight is gained from BI and experiments.
	Automation of operational decisions has begun.	Operational decisions are mostly automated. (For an example which customer that should be contacted by a salesperson.)

Ability to Deliver BI

	Nivå 1	**Nivå 2**	**Nivå 3**
BI Architecture	Silos dominate the BI environment.	Architecture is platform specific.	The organization has a plan to introduce BI in the whole organization, including IT processes and governance.
Information Management	Only static, structured data exists.	Some integration of data sources has been accomplished.	Information is standardized, and consists of both structured and unstructured data.
	Multiple versions of the truth exist (Ex. The definition of a customers varies in different systems)	A data steward is owner of meta-data and is responsible to update it when the organization changes.	One version of the truth is defined.
Tools & Applications	Mostly excel and historical data are used for analysis.	Dashboards are used to present metrics.	The organization has a proliferation of tools, applications and data marts.

Ability to Deliver BI

	Nivå 4	**Nivå 5**
BI Architecture	Seamless integration of structured and unstructured data is performed.	The organization has complete enterprise-wide BI infrastructure.
Information Management	Standards, policies, and processes are defined and enforced across the entire organization	All relevant internal and external data is integrated and available in the whole organization.
	The data quality, and the confidence in the data, is high.	All information comes from one trusted source.
Tools & Applications	BI is largely integrated in existing applications.	BI is delivers the right data, to the right person, at the right time and for the right reason.