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SAMI SJÖBLOM  
COMPETITIVE INTELLIGENCE – CONDUCTING AN ANALYSIS  
OF A BUSINESS ENVIRONMENT

Master of Science thesis

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## ABSTRACT

**SAMI SJÖBLOM:** Competitive Intelligence – Conducting an Analysis of a Business Environment

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This Master of Science thesis is an examination on how does the process of Competitive Intelligence work for as an approach to analyze a fresh, fast-growing and competitive market environment, and through that, for conducting a strategic knowledge product. The empirical part of the work is directed by the interests of the client, Nokia Technologies Oy. The empirical study studies the technology markets considering virtual reality. The research problem is to solve whether a CI based approach works for an analysis of a dynamic and uncertain competitive environment, or not. As a conclusion, the CI works well as a process, being a systematic way to conduct a competitive analysis in a purposeful and manageable manner.

Competitive Intelligence is a term which refers to gathering, analyzing and applying competitive information that is publically, ethically and legally available, into decision-making to gain significant competitive advantages. The CI process enables one to define the key questions regarding a specific issue and answering to them in a way that bases on a strictly defined scope and objective-setting, the identification of information sources, and the selection of relevant methodological choices in terms of analytical tools. The process calls for a commitment and communication from the analyst, and from the decision-makers. The knowledge product will be distributed to the stakeholders in a chosen format, and in the end of the process, the interpretation of the results, conclusions, and the application into practice will take place.

The results suggest that the use of KIT is an appropriate starting point to define a clear framework for the CI process. The process requires a constant monitoring of the emergent business environment, and an on-going information flow to keep the process timely and relevant. Value chain mapping is a slightly heavy technique to analyze the environment, yet it delivers a great platform to map the marketplace at a high level. Scenario analysis enables a flexible way to support strategic planning by enabling a firm to focus on the key factors that might shape the industry. The CI practice is at its best when it is an agile process that has short cycle times with frequent reviews and goal-setting in accordance with the strategic needs.

## TIIVISTELMÄ

**SAMI SJÖBLOM:** Competitive Intelligence – Analyysin toteuttaminen toimintaympäristöstä

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Diplomityö tutkii Competitive Intelligence -prosessin soveltumista lähestymistavaksi tuoreen, nopeasti kasvavan ja kilpailullisen markkinaympäristön analysoimiseksi, ja sen kautta luotavan strategisen tietotuotteen luomiseksi. Työn empiiristä aihealuetta ja sen laajuutta ohjaavat toimeksiantajan Nokia Technologies Oy:n intressit. Työn empiria rakentuu virtuaalitodellisuuteen liittyvien teknologiamarkkinoiden ympärille. Työn tutkimusongelmana on selvittää, toimiiko CI-perusteinen lähestymistapa analysoitaessa dynaamisista ja arvaamatonta kilpailukenttää. Johtopäätöksenä voidaan sanoa, että CI toimii prosessikehyksenä systemaattisena tapana toteuttaa kilpailuanalyysi määrätietoisesti ja hallitusti.

Competitive Intelligence on käsite, jolle keskeistä on julkisesti, eettisesti ja laillisesti saatavissa olevan kilpailutiedon etsiminen, analysoiminen ja soveltaminen päätöksentekoon merkittävän kilpailuedun saavuttamiseksi. CI-prosessi mahdollistaa strategisten avainkysymysten määrittämisen ja niihin vastaamisen lähestymistavalla, joka pohjautuu kilpailututkimuksen rajattuun laajuuteen ja tarkkaan tavoiteasetantaan, tietolähteiden tunnistamiseen, sekä oikeellisten metodologisten lähestymistapojen valintaan analysointityökalujen osalta. Prosessi edellyttää sitoutumista ja vuorovaikutusta niin analyttikon, kuin myös päätöksentekijöiden osalta. Tietotuote välitetään asiaankuuluville sidosryhmille valitussa formaatissa, ja prosessin lopussa korostuu etenkin lopputulosten tulkinta, johtopäätösten tekeminen ja tulosten soveltaminen käytäntöön.

Tuloksiin perustuen voidaan sanoa, että KIT on hyödyllinen lähtökohta selkeän viitekehysten luomiseksi CI-prosessia varten. CI-prosessi edellyttää kehittyvän toimintaympäristön jatkuvaa tarkastelua, sekä katkeamatonta, ajallista sekä keskeistä tietovirtaa. Value chain mapping on hieman raskas tekniikka toimintaympäristön analysointia varten, mutta toisaalta se mahdollistaa hyvän pohjan kilpailukentän korkeatasoiseen kartoittamiseen. Skenaario-analyysi taas mahdollistaa joustavan tavan tukea strategiatyötä, mahdollistaen keskittymisen niihin avaintekijöihin, jotka saattavat merkittävästi myötävaikuttaa teollisuuden kehityssuuntaan. CI-menettelytapa on parhaimmillaan, kun prosessi on ketterä ja yksittäiset CI-kierrokset pidetään lyhyinä, jonka lisäksi prosessin tuloksia tulee arvioida säännöllisesti sekä uusia tavoitteita tulee asettaa strategisten tarpeiden mukaisesti.

## PREFACE

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The thesis project was a pleasant journey into some of the most interesting fields of the pursued degree, and provided me with valuable insights into academic work and the application of the theory into practice.

Tampere, 10.11.2015

Sami Sjöblom

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*APPENDIX A: Value Chain Map*

## LIST OF KEY TERMS AND ABBREVIATIONS

- CI                    *Competitive Intelligence* is a process of acquiring competitive data and information from public sources in a legal and ethical manner and turning it into actionable intelligence through an analysis. It is practiced to make sense of the competitive environment and market conditions. (McGonagle & Vella 2012, p. 9)
- KIT                   *Key Intelligence Topics* are the intelligence topics that hold the greatest significance for the relevant decision-makers. Thus these topics will direct the objectives of the intelligence work and therefore, they act as filters through which the information gathering and analytical processes pass. (Blenkhorn & Fleisher 2005, pp. 18-19)
- VR                   *Virtual Reality*, also known as Immersive Multimedia, is a computer-enabled simulation of a physical presence of a user in either a virtual or real-life environment. The immerse of a virtually-imagined reality can be enhanced by reconstructing sensory experiences regarding senses, for example touching, hearing, seeing and smelling. (Bailey et al. 2011, p. 5; Immersive Education 2015)

# 1. INTRODUCTION

The first chapter introduces the background and motivation to conduct the thesis. Furthermore, the chapter states the research problem, research questions and objectives that direct the conduct of the work. Moreover, along with the scoping and limitations, the philosophical and methodological approaches will be defined. Finally, the structure of the thesis will be presented.

## 1.1 Research Background and Motivation

Due to advancing technology and globalization, the competitive landscape has faced significant changes in recent years. The modern business environment is extremely competitive and the focus has shifted to product and service innovations, as well as on customer satisfaction. Besides that companies have to discover new business models to sustain their position in the existing markets, they also have to strive to expand into new and emergent marketplaces. (Blenkhorn & Fleisher 2005, p. 17) Especially, the dynamic state of high-technology industries nowadays appears to be challenging to any actor from small-scale companies to multi-business organizations operating in an industry. The market conditions become unpredictable as disruptive technologies and breakthrough innovations shape the industrial characteristics.

There is a growing need for being aware of uncertain market conditions. Moreover, it is necessary to be capable of responding proactively to the up-coming changes that might shake the industry. Particularly, high-technology industry has, and still is, going through a rapid development as the innovations and incremental improvements develop the industry in a highly competitive manner. In order to maintain a sustainable competitive position in the fierce business environment, it is certainly important to have a versatile and in-depth understanding of the determinants driving the change. For any competitive responds, the current state of the industry, recent technologies, competitors, markets and the macroeconomic situation should be taken into account for any strategic planning. (Dishman & Calof 2008, pp. 767-768; Nasri 2012, p. 25)

This leads us to the context of the empirical part of the work that considers the virtual reality industry. The possibility that the immersive virtual technologies might revolutionize the way people enjoy multimedia and other audiovisual products, makes the topic both highly timely and interesting. Despite that virtual reality has been a topical subject for decades the recent technology has made the industry actually feasible. Moreover, the industry came again into spotlight in 2014 when Facebook acquired Oculus, a VR company. (Forbes [1] 2015; Techradar 2015; CEA 2015, p. 24) As the industry has not yet turned

into consumer's reality, the information has been basically hype and rumors. Hence, the motivation to study the business environment is based on, yet not limited to, some facts:

- Still in the beginning of 2015 VR as a market did not really exist. (UploadVR 2015) However, VR technology has experienced a dramatic evolution during the recent years and has attracted a number of new entrants from big players (e.g. Samsung, Microsoft) to fresh startups (Techradar 2015), accelerating the market creation and growth.
- Thus VR industry is an emerging marketplace, currently led by VR headsets for gaming, social and mobile purposes (Techradar 2015), but soon to expand into the fields of cinematic content, music and sport events, for instance. (Virtual Reality Reviewer 2014; Cinematography Database 2014; UploadVR 2015) Someday, VR experiences might integrate into daily life. (Immersive Education 2015; Forbes 2015 [1])
- It is still hard to predict how technologies will work together as there is no real VR video standards (TNW 2015) and thus the firms, products and technologies, strategic partnerships and other factors affecting the structure of the future industry are necessary to be understood.

Moreover, the entry of immersive technologies and content are likely to reshape the current roles and dependencies between actors in the field of media creation, distribution, sharing, and consumption. Hence, the phenomenon should be understood as a whole, especially if there are any signals of disruptive solutions entering the market. The market is non-standardized and still scaling. Due to this, most of the information of can only be derived from a variety of timely sources, for example by studying competitors and industrial elements related to the competition. The gathered information should be analyzed in a systematic and appropriate manner, that valuable knowledge could be created. All of this justifies the general framework and approach of the thesis, that is, competitive intelligence. The practice of competitive intelligence will keep the organization up-to-date of the dynamic and yet hardly predictable business environment.

It is estimated that the VR industry is facing an enormous growth during the next years. Thus understanding the competitive dynamics in the marketplace could be a great advantage for any party operating in the market. The work bases on the mutual interests of the thesis writer and the employer. The objective was an end result of the realization that the employer needed a better picture of the market, and especially within a scope that serves the companies highest interests. As the employer has announced an own VR device, it is certainly important to analyze the business environment in order to support strategic planning and business development activities.

## 1.2 Research Problem, Research Questions and Objectives

The objective is to conclude with an analysis of a business environment by using CI cycle as an approach. The process covers several phases that cover, for example, the goal-setting and scoping of the CI initiative, the process of information gathering, developing the intelligence through the use of analytical tools, communicating it further, and finally reviewing the results and using the created intelligence in the decision-making processes. The work has an intention to support strategic planning in the target organization that is currently entering a growing technological marketplace.

Therefore, there is a need for a clearer picture of the market of interest. The focus will be on competitive actors and other stakeholders, dependencies between them, as well as on the development activities and products within the emergent VR market. At the time, the market shares are not really distributed as many of the products are still under development.

The main research question is as follows:

- How does a CI based approach work for the conduct of an analysis in regard to an emergent technological marketplace?

The question represents the main question that encompasses all the topics and sub-questions. It states how does the approach, which bases directly on the suggested principles and steps to take in the process of competitive intelligence, fit for an analysis of a business environment. The conclusion should consider whether the approach was useful in general and did it enable desired results, or not.

The main research question is supported by the sub-questions that can be addressed as

- What is Competitive Intelligence?
- How is the process of CI defined across the literature?
- What do the phases of CI cycle consist of?
- How can the CI cycle be applied in order to develop an intelligence product of a business environment?
- Does the CI based study deliver new insights on VR markets?

The first sub-question represents a comprehensive study on competitive intelligence that clarifies the definition of CI, distinguishes between it from other types of intelligence and states the motivation to utilize competitive intelligence in this work.

The second sub-question examines the literature on competitive intelligence processes, and strives to identify the common characteristics of a CI process.

The third sub-question studies the phases and the structure of the CI cycle. The chapter consists of all the steps of the cycle as they will be utilized and examined during the empirical study.

The fourth sub-question stands for the empirical application of the theory. Therefore, through an empirical study, it examines how to apply the general theoretical groundwork and the CI cycle in a way that an intelligence product can be created.

The fifth sub-questions represents a fundamental and conclusive question on whether the CI based initiative created novel or unique information about the marketplace regarding VR technologies. The question is discussed in the results.

### **1.3 Scope and Limitations**

In theoretical part, the research is conducted by using academic sources to a great extent. The empirical study targets is to identify and analyze competitive actors and activities in the disruptive marketplace. The practical scoping of the empirical examination is done as part of it. The amount of information sources will be high, including journals, magazines, competitor profiles, annual reports, and databases, for instance. Due to the high volume of used information sources, most of the sources will be shown as a summarization in the results, and they will be discussed accordingly. The analysis will, however, be supplemented with some of the information sources to strengthen the ground for distinct statements. Further, as the VR industry is developing in a rapid pace, it is necessary to utilize mainly fresh information in the empirical analysis.

The final product is to provide new, accurate, reliable and credible array of actionable knowledge regarding the marketplace. The analysis will be as in-depth as it is possible to reach within the time horizon. Hence, the end-results in terms of the empirical study are depending on how much information can be gathered, and how much of it can be analyzed in a reasonable time during the thesis work. The fact that only few particular tools and approaches will be chosen for analyses will strongly restrict the scope and viewpoints.

### **1.4 Research Philosophy and Methodology**

According to Olkkonen (1994), the research methodologies deal especially with the background theories, the way the information is gathered and modified, and with the interpretation of the results. Thus the research methodologies are intended to convince the reader that results deliver new and fact-based information about the observed subject. The methodologies should be relevant and acceptable in order to consider the study as scientific. (Olkkonen 1994, pp. 20-21)

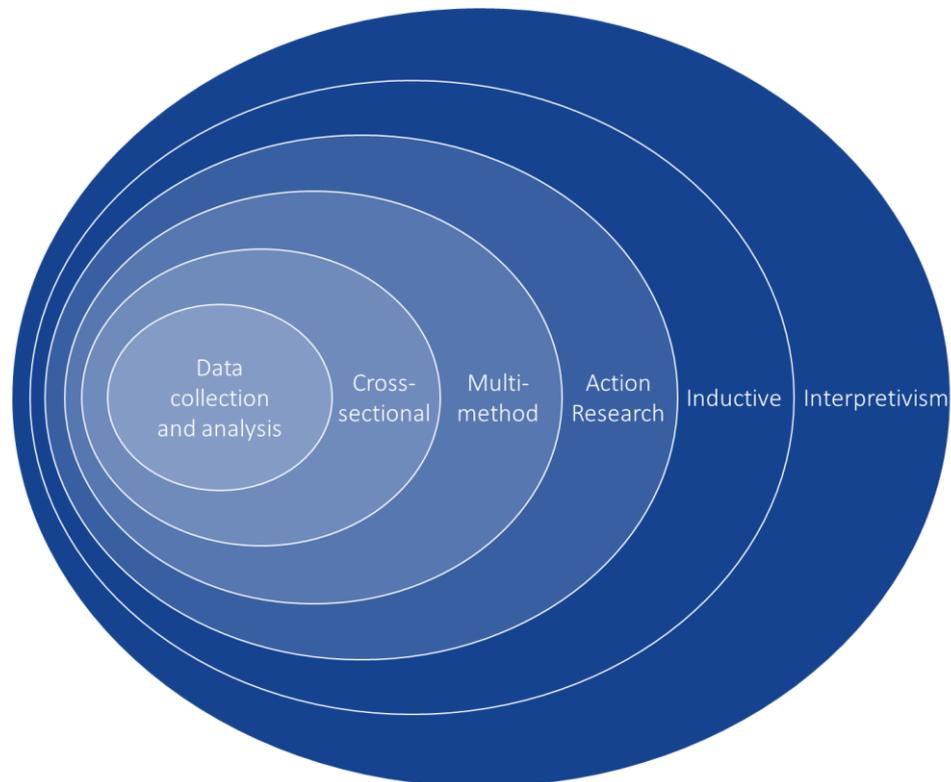
There are several aspects on how to conduct a research. A high-level approach are the research philosophies based on the ideologies and objectives behind the previous research

work along the history. According to Saunders et al. (2009), the philosophy reflects the way a researcher views the world – it is not only concerned with the development of knowledge, but it is also related to the nature of knowledge. All the assumptions regarding the research philosophy being adopted will also influence the choices of research strategy and approaches. There is a need for being aware of the philosophical approaches. They do not only affect the way the research is conducted but it also sharpens the understanding of the subject under the investigation. (Saunders et al. 2009, pp. 107-108)

The philosophies are commonly divided into positivism and hermeneutics, for example. Positivism is an approach that aims to conduct a firm fact-based scientific research, thus ignoring all the doubtful considerations and conclusions. Positivism states that the research should study only phenomena that are proved facts, and the research should be as value-free as possible. Realism is another view that is related to observable evidences. Realism emphasizes the objectivity of the study that bases on established and concrete facts. Practically, it means that the truth is what the senses can show us. (Olkkonen 1994, pp. 26-27; Saunders et al. 2009, pp. 114-115) Hermeneutics is a philosophical approach that emphasizes the interpretation, meaning and understanding of a phenomenon. (Olkkonen 1994, p. 27) The knowledge is thus created by interpreting the phenomena, perceiving the relationships between the subject and its context and by observing the subject in relation with similar phenomena. Hermeneutical approaches state that the knowledge is a process that continuously shapes the existing knowledge and interpretations. Therefore, hermeneutics is a major interpretivist orientation. Interpretivism refers to an approach that stresses interpretations and the ways the interpretations are being conducted in terms of formatting knowledge. Interpretivism is a common approach for qualitative researches. (Jyväskylän yliopisto 2015)

There are certain differences between positivism and hermeneutics. The differences are especially concerned with repeatability, validity, and the type of material being used. For instance, an essential characteristic of positivism is that the results should be repeatable and thus independent on the research. That is to say, if the research is conducted again by using the same material and methods, the results should be the same. On the contrary, hermeneutics do not intend to provide necessarily repeatable results. This is due to the nature of a hermeneutical orientation that strives for an understanding of the phenomenon and which utilizes mostly qualitative material. Another difference is the provability regarding the validity of the results. The reason is mostly the same as for the differences between the repeatability of the results. As hermeneutics do not intend to repeatable results, it is clear that the degree of truth and certainty is lower with the hermeneutics. Moreover, there are differences between the materials used for the research. Whereas positivism tends to use previous theoretical background work and a strong base of empirical material that can be analyzed with, for example, statistical methods, hermeneutics attempt to generate new knowledge mainly through empirical observations. This means that the material often consists of selected case studies that cannot be investigated through

statistical methods. Even though this kind of material is more challenging to handle, it might provide surprising insights, it enables a freer way to interpret the material and it can be complemented with additional case studies. (Olkkonen 1994, pp. 35-37) The Figure 1 illustrates the philosophical and methodological choices of the work.



**Figure 1.** The methodological choices of the work (adapted from Saunders et al. 2009)

In accordance with the previous examination on research philosophies, this work has a *hermeneutical approach*. This is due to the object of the thesis: To examine a given phenomenon which is not well-known and about which there is just scarcely any valid information available. Specifically, the aim is to produce valuable insights and knowledge through the interpretation of gathered material. Hence, the research is not intended to be repeated in similar conditions. Moreover, the material utilized is qualitative thus advocating the hermeneutical approach.

Further, the researcher has an *inductive approach*. Saunders et al. (2009) state that an induction emphasizes the collection of qualitative data, more flexible structure of the work, researcher as part of the research process and less concern about the generalization. Deductive approach would emphasize the collection of quantitative data, highly structured approach and scientific principles. (Saunders et al. 2009, p. 127)

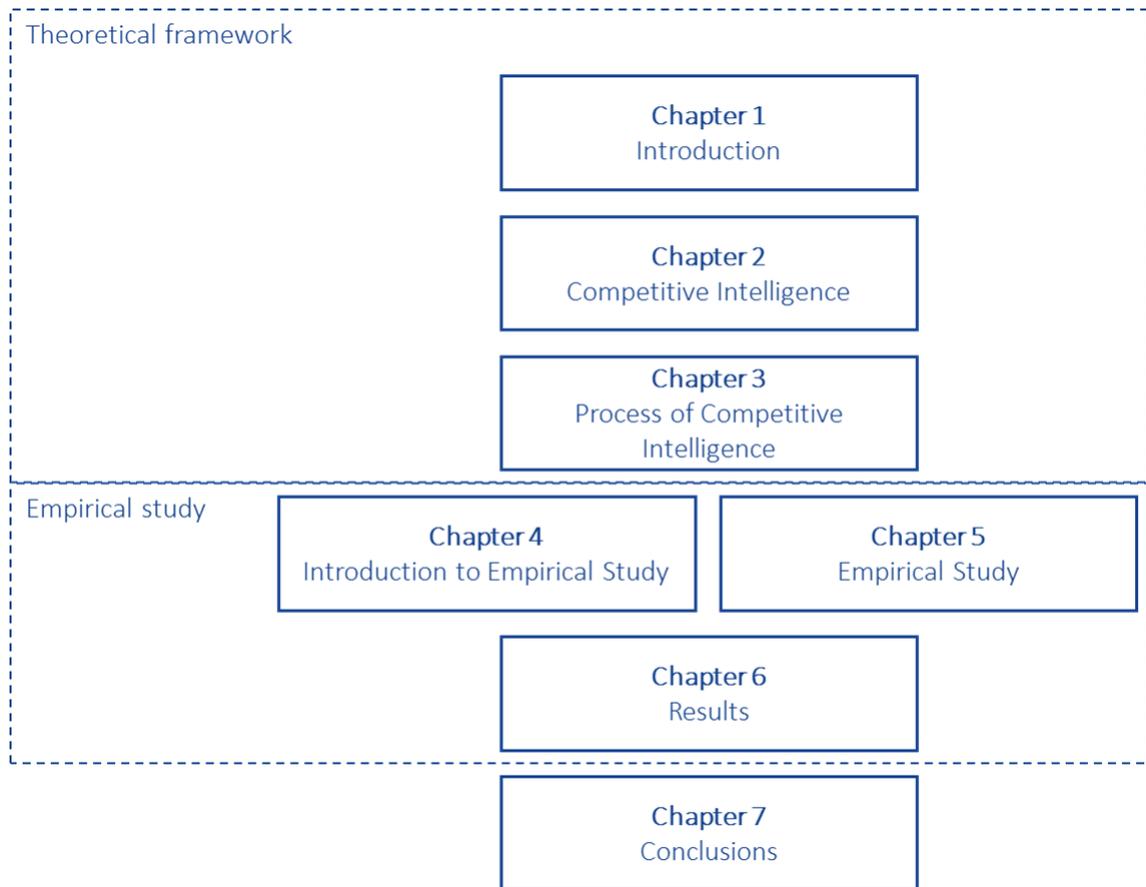
The research can be defined as an *action research* which, according to Saunders et al (2009), can be interpreted in various ways. First, the work is a research in action rather than a research about action: The empirical part of the thesis is conducted on practical

observations built on the theoretical framework. Further, the second point of view consider people to be involved in the research process. An action research normally involves stakeholders within an organization, including the researcher. Thus the researcher among the other involved persons are part of the research and change process taking place in the organization. The third viewpoint is clearly defining the subject of the thesis: An action research often includes a diagnosis consisting of fact finding and analysis, which is then taken into consideration to enable planning and a decision-making regarding actions. Then, the actions are performed and evaluated afterwards. (Saunders et al. 2009, p. 147)

The choice of a method is to use multiple methods, which is certainly common approach across business and management researches. A research may include quantitative and qualitative data, as well as primary and secondary data sources. (Saunders et al. 2009, p. 151) More specifically, the research uses a multi-method approach which may include different ways of data gathering, but usually restricted to either qualitative or quantitative data. In this case is the choice is to collect qualitative data. Thus we can state the research method to be *multi-method qualitative study*. Finally, the research is a *cross-sectional study* as it provides a snapshot of the current market situation. It provides insights of the subject at the given point of time. (Saunders et al. 2009, p. 155) Data collection is performed through an online desk research, and the research process is complemented by opinion of the people involved in the research process.

## 1.5 Research Structure

The structure of the work is divided into theoretical examination, empirical study and to the final conclusions. Hence, the first three of the chapters are dedicated for theoretical examination of the subject whereas the following three chapters are dedicated for the empirical study. The seventh chapter discusses of the findings that occurred during the work. The Figure 2 illustrates the structure of the thesis as described. The thesis is conducted in English as it is the official working language of the firm the thesis was made for. Moreover, English as the choice of a language provides a global comparability between previous researches and enables the chance for a broader audience to interpret the content.



**Figure 2.** *The structure of the research*

The first chapter introduces the background of the work, states the research problem, questions and the objective of the thesis, sets the scope and limitations for the work and describes the philosophy, methodology and the structure regarding the research.

The second chapter introduces the theoretical framework for competitive intelligence. The first sub-chapter consist of the definition of competitive intelligence and the benefits of using it. Moreover, it also clarifies the legal and ethical aspects that are seamlessly related to the competitive intelligence as a concept and also, distinguish between closely associated intelligence concepts are executed.

The third chapter takes a glance at the process of competitive intelligence. First, the chapter examines how the CI process is defined across the literature, and concludes with the characteristics and phases the CI process is commonly seen to cover. Then, the chapter examines CI cycle, as it is the framework for the empirical study. The cycle includes five separate steps which all of them are studied in theory.

The fourth chapter is dedicated for the introduction of the empirical study and thus it introduces the organization the thesis is made for, introduction to virtual reality and also, the motivation for the use of competitive intelligence is clarified.

The fifth chapter is the empirical study to which the theoretical framework of CI Cycle is applied. The cycle starts with the planning phase that includes clarifying the objectives through key intelligence topics, setting the scope accordingly, identifying initial information sources and selecting the analytical tools. The second phase explains the process of gathering the information whereas the third phase is for using the chosen analytical methods. Fourth part examines how the intelligence is distributed into use and finally, the last phase considers the feedback and learnings from the intelligence process.

The sixth chapter delivers the results found during the empirical analysis, and concludes with insights on how well did every phase work out in the process in accordance with the intended purpose of the empirical study.

The seventh chapter stands for the discussion, what were done in the work, what were the main findings, and what research topics can be suggested for the future.

## 2. COMPETITIVE INTELLIGENCE

The dynamic nature of a business environment from industry to another seem to create challenges for competing companies. In order to understand and response to the fast-paced and changing business conditions, organizations have to gather, analyze and utilize the information derived from competitive conditions. This will help companies to secure or improve their competitive position for the intentions in the future. (Calof & Wright 2008, p. 719; Dishman & Calof 2008, p. 767; Nasri 2012, p. 25) A vital part of the competitiveness derives from the utilization of timely and relevant information about the industry and environment. (Ding 2009, p. 327)

The next chapters will introduce the concept of competitive intelligence, the benefits of a CI practice, as well as the legal and ethical aspects regarding an intelligence process. Further, the final sub-chapter examines the differences between commonly recognized types of intelligence practices to distinguish competitive intelligence from the other concepts.

### 2.1 Definition

Competitive Intelligence (hereafter, CI) is a process allowing companies to analyze and to understand the information derived from market conditions, competitors and customers and to transfer it into usable, appropriate and precise strategic knowledge. This knowledge, or in this context *intelligence*, is used as a basis for strategic analysis, such as to recognize threats and opportunities, or to evaluate the target markets and the competitive landscape. (Lemos & Porto 1998, p. 331; Jaworski et al. 2002, p. 279; Benczúr 2006, p. 37; Wahab & Othman 2006, p. 547; Albescu et al. 2008, p. 1; Dishman & Calof 2008, pp. 767-768; Johns & Van Doren 2010, p. 551) The use of word *competitive* therefore refers to the form of a multifaceted contest between two or more parties in a commercial or business context. (Fleisher & Bensoussan 2015, p. 4)

Despite that the heritage of CI can be traced thousands of years back to the historical China regarding the intelligence on military applications and war books, the term Competitive Intelligence appeared in the 1930s for the first time. (Benczúr 2006, p. 37; Calof & Wright 2008, p. 718) Ever since, there have been writings on “Competitive Intelligence”, “Strategic Intelligence” and “Environmental Scanning” (Benczúr 2006, p. 37; Dishman & Calof 2008, p. 767), as well as on “Market Intelligence”, “Competitor Analysis”, “Business Intelligence” and “Competitive Technical Intelligence”. (Dishman & Calof 2008, p. 767). During the 1980s, “Competitive Intelligence” was emphasized due to the increasing focus on external information (Benczúr 2006, p. 37; Dishman & Calof 2008, p. 767) Again, this was partly due to the introduced business intelligence systems

and management information systems that came into use during that time. (Benczúr 2006, p. 37)

The definition of CI seems to be rather similar across the literature. According to Calof and Wright (2008), CI is a collection of information gathered from internal and external sources, from competitors, suppliers, customers, environment, technologies and potential businesses. This collection of information helps to proactively identify and respond to the moves of competitors, government and customers. (Calof & Wright 2008, p. 723) McGonagle and Vella (2002) define CI as the development and the use of data gathered from public sources regarding market, competitors and competition followed by an analytical process which transfers the collected data into intelligence. In this context the process of collecting public information refers to identifying, locating and accessing information in a legal and ethical manner. (McGonagle & Vella 2002, p. 3; Albescu et al. 2008, p. 1) According to Nasri (2012) CI is the activity of acquisition and usage of information regarding existing and new competitors, both suppliers and customers as well as the competing industries. The gathered information will improve the competitiveness of an organization by supporting the decision-making process. CI acts as an input that provides managers with the information they need to know about the recent and upcoming competition, taking the strengths of own organization, current marketplace, technological developments and competitor responses into account. (Nasri 2012, p. 25) Moreover, Bose (2008) and Ding (2009) interpret the CI as a process and a product. Firstly, it is a practice of collecting, analyzing and applying information about competitors, products, customers and other actors in a certain marketplace for short and long-term strategic planning needs. The output and the product of CI is actionable intelligence which will enhance the decision-making. (Bose 2008, pp. 511-512; Ding 2009, pp. 328-329)

Traditionally, the CI has been defined as a sequential process of planning, collecting and analyzing information which will form a process of monitoring the competitive business environment. The aim to deliver intelligence that is actionable and hence, applicable to the current business conditions. Ideally, the competitive intelligence improves the competitiveness of an organization. (Jaworski et al. 2002, pp. 279-280; Johns & Van Doren 2010, p. 551; Nasri 2012, p. 25) Still, it should be noted that the description of CI as a process of data gathering and analysis is not really an adequate description. CI is a rather a continuous process than a single initiative. Furthermore, it takes the whole process of intelligent generation in an organization into account, consisting of organizational, social and individual factors. (Jaworski et al. 2002, pp. 279-280) It is a necessity for an organization to have a dynamic process of collecting, evaluating, integrating and using information for its critical needs and competitive targets. (Nasri 2012, pp. 25-26)

CI has gained more attention due to the increasing amount of public information available from several sources, for examples from wikis, blogs, e-mails and other electronic communications. The variety of different sources create the basis for a meaningful CI. (Nasri

2012, p. 25) However, by referring to *public sources* in the context of CI it is fairly compulsory to understand that it means a much broader concept than just a published information. According to McGonagle and Vella (2012), public refers to all information that is legally and ethically available and thus it can be identified, located and accessed. In this sense it can be addressed that CI practices and sources may vary remarkably – it is not just the use of information meant to be shared and published – from electronic and online-based databases, human-related knowledge and physically published information as long as the practice is pursued in legal and ethical manner. According to this viewpoint, legal and ethical matters should be clarified and clear before any action. (McGonagle & Vella 2012, p. 9)

These days, the role of CI in global companies seem to be twofold, which can be seen from the different viewpoints of corporate and business unit levels. From the corporate point of view the focus is on answering the question that in which businesses should the firm operate in, whereas the business unit perspective is answering the question that how should multiple divisions be managed accordingly. (Ding 2009, p. 329) Some of the organizations have a functional CI unit with a full-time director, some the organizations prefer ad hoc CI activities with less resources. It is well known that especially the companies that are big in size do have initiated their own internal CI activities which constantly collect data and information in order to support strategic decision-making. (Jaworski et al. 2002, p. 283; Bose 2008, p. 510; Bartes 2013, p. 283).

## **2.2 Benefits of Competitive Intelligence**

The fundamental reason to utilize CI is that an organization needs data and information derived from the market in order to understand, not only the past and present, but also the future. CI has the aptitude to provide insights about future-oriented intentions of the competitive environment through legal means. (Bartes 2013, p. 283) Bose (2008) states that the CI is a crucial element for the strategic planning of the firm as it summarizes the data and information from a large and strategic scale and through that allows the company to predict the dynamics of its competitive environment. (Bose 2008, p. 510) Ideally CI enhances the competitive advantage of a firm as it would weaken the competitiveness of its rivals at the same time. (Dishman & Calof 2008, p. 767; Johns & Van Doren 2010, p. 551) Ding (2009) suggests that an important benefit of CI is the decreasing uncertainty of decision-making which will follow when the CI is being practiced. (Ding 2009, p. 327)

McGonagle and Vella (2012) state that the CI practices in an organization do bring value – even though it must be noted that the evidence of the valuable impact is not often direct (McGonagle & Vella 2012, p. 13). According to Calof and Wright (2008), the CI is performed in order to achieve certain results which can be increased profits, the creation of new products or services, costs savings, or about the strive to meet the financial objectives. (Calof & Wright 2008, p. 723) Nasri (2012) suggests that a major benefit is an

increased competitive advantage which is derived from discoveries of new or more efficient ways to compete within an industry and in that way, allowing the firm to outperform its competitors. This is due to better strategic decision-making and organizational performance by improved business planning. (Nasri 2012, pp. 30-31)

Nevertheless, some of the case studies from the past give a positive signs for using frequent CI practices. For example, it was already discovered in the early 1990s in the packaged foods industry that a significant effort put into CI practices will increase the product quality by 37 percent which was again, associated with a raise of 68 percent in terms of business performance. A bit more recently, the study in 2002 pursued by PricewaterhouseCoopers pointed out that the 84 percent surveyed virtually fast-growing companies saw the CI activities as a significant resource. (McGonagle & Vella 2012) Moreover, Calof & Wright (2008) and Bose (2008) state that there are commonly certain key intelligence topics, for instance company profiles, competitive benchmarking, early warning alerts, market and industry trends and so forth, in which the CI is commonly concentrated on. In addition, the intelligence collected from these topics resulted in the form of support for decision-making, for example in the fields of business strategy, business development, market entry decisions, product development, research and development, decisions on mergers and acquisitions, and so forth. (Bose 2008, p. 515; Calof & Wright 2008, p. 724) According to Nasri (2012), the strategic benefits of CI processes drive the competitive advantage through enhanced innovating, marketing differentiation, lower costs, customer satisfaction, market shares and revenue prospects. (Nasri 2012, p. 31)

### **2.3 Ethics and Legal Aspects**

The increasing global competition is likely to put companies under pressure for being constantly aware of the surrounding business environment and especially, for staying conscious about what the rivals are up to. (Jordan & Finkelstein 2005, p. 2) Not surprisingly, CI raises concerns about legality and ethics concerning businesses. (Murphy 2005, p. 45) For instance, companies in the U.S. invested already one billion US dollars on CI programs in 2005. Controversially, already in 1999 the Fortune 100 companies lost around 45 billion US dollars as thefts of proprietary information. (Jordan & Finkelstein 2005, p. 2)

CI prohibits any illegal actions considering competitive information gathering. As stated previously, CI is an act of analyzing external environment in a legal and ethical manner. (McGonagle & Vella 2002, p. 3; Wahab & Othman 2006, p. 548; Albescu et al. 2008, p. 1) Information acquisition in an illegal way does often refer to espionage, industrial and economic spying. (Lemos & Porto 1998, p. 331; Jordan & Finkelstein 2005, p. 2; Benczúr 2006, p. 37) Therefore, a CI practitioner should certainly be aware of to what extent of different methods can be applied legally when gathering competitive information. (Murphy 2005, p. 45)

## 2.4 Distinguish Between Different Types of Intelligence

There are several widely used business-related terms including the word *intelligence*, and often these terms happen to be closely related to each other. Despite the obvious associations and similarities between the terms, they should be distinguished from each other.

To start with, *Business Intelligence* is an organized process of gathering, analyzing and distributing information important for the business. Even though BI has been linked and even used together with CI in the past, nowadays BI is more commonly associated with data warehousing and data management. Therefore, BI is considered scanning internal environment of a firm for summary information that is important for decisional situations. (Albescu et al. 2008, p. 5; Ding 2009, p. 329; McGonagle & Vella 2012, pp. 17-18) Due to its name and general similarity, *Competitor Intelligence* has a stronger focus on competition than CI. Competitor Intelligence concentrates directly on competitors, their current activities and intentions for the future, capabilities and plans. (McGonagle & Vella 2012, p. 14) The scope of *Market Intelligence* is basically restricted to the current state and activities in the marketplace, such as firm's markets, competitors and customers. The information is commonly targeted for sales people, market research initiatives and other marketing functions in the organization. Therefore, Market Intelligence is often closely associated with Market Research. (Ding 2009, p. 329; McGonagle & Vella 2012, pp. 15-16)

Maybe the closest to CI according to its definition, *Strategic Intelligence* is an initiative that focuses on long term factors, approximately within the range of couple of years that affect the success of a firm. It supports strategic and tactical decision-making, which usually considers high-level intelligence in terms of competitive, economic and political factors. Usually used by senior manager and executives. (Ding 2009, p. 328; McGonagle & Vella 2012, pp. 13-14) Another terms is *Technical Intelligence* which allows an organization to recognize and exploit technological development and scientific breakthroughs by providing intelligence for R&D functions, for instance. Hence, it is also about responding to the threats occurring from technological changes. (McGonagle & Vella 2012, p. 16) Thus we can state that especially Competitor Intelligence, Market Intelligence and Strategic Intelligence are rather closely related to CI. However, these intelligence types have their own distinct characteristics. Table 1 clarifies the practical differences between these terms.

**Table 1. Characteristics of different types of intelligence**

Term	Characteristics
Business Intelligence	Internal sources, often analyzing historical data, commonly a reference to both, the software and process for managing a vast amount of data that is relevant for the process of decision-making. (Albescu et al. 2008, p. 1; McGonagle & Vella 2012, pp. 17-18)
Competitive Intelligence	External sources, historical and recent data, future predictions, analyzing opportunities and threats in the target environment and evaluating competitive landscape. (McGonagle & Vella 2002; Albescu et al. 2008, p. 1)
Competitor Intelligence	External sources, both historical data (from 6 months to one year) and predictions for the future (1-2 years to the future), assessing and understanding the potential, positioning, intentions and plans of competitors. (McGonagle & Vella 2012, p. 14)
Market Intelligence	External sources, usually retrospective data (ca. 3 to 6 months), focus on learning from the previous success or failure as well as on sales and payment related and financial aspects. (McGonagle & Vella 2012, pp. 15-16)
Strategic Intelligence	External sources, long-term planning (3-5 years), capital investment plans, political risk assessments, M&A/joint venture/corporate alliance, R&D planning, focus on suppliers, customers, substitute products and services, identification of potential competitors. (McGonagle & Vella 2012, pp. 13-14)
Technical Intelligence	External sources, relatively long time horizon of 1-5 years, a bit overlapping focus with competitive intelligence and market intelligence on market trends, activities and capabilities of competitors especially in terms of technology, with an interest in suppliers and customers. (McGonagle & Vella 2012, p. 16)

As the Table 1 shows, all of the terms are connected yet not directly considered a synonym with CI. According to Ding (2014), there are even more subcategories under CI, such as tactical intelligence (a short term initiative, often supporting sales operations, for instance) and operational intelligence (business process and activities monitoring). (Ding 2009, p. 329) In the context of this paper, the CI associates most closely with strategic intelligence and market intelligence.

### 3. PROCESS OF COMPETITIVE INTELLIGENCE

The first chapter studies the literature on CI process by defining the characteristics and the structure of the CI process by various authors. Finally, the first sub-chapter concludes with a summarization of a CI process that involves the most common characteristics of the process found from the literature. The second chapter studies CI cycle, a process model that will be used as a framework for the empirical study in the latter chapters. The model will be introduced in an in-depth manner, clarifying the theoretical base for the empirical part.

#### 3.1 Definition

According to Johns and Van Doren (2010), intelligence refers to the application of knowledge on one's environment in order to manipulate it. There has been a belief that CI is a necessity in order to manage the changes within an industry. Moreover, it is believed that there is a need for CI as a process as organizations are continuously changing their services and way of marketing communications. (Johns & Van Doren 2010, p. 552)

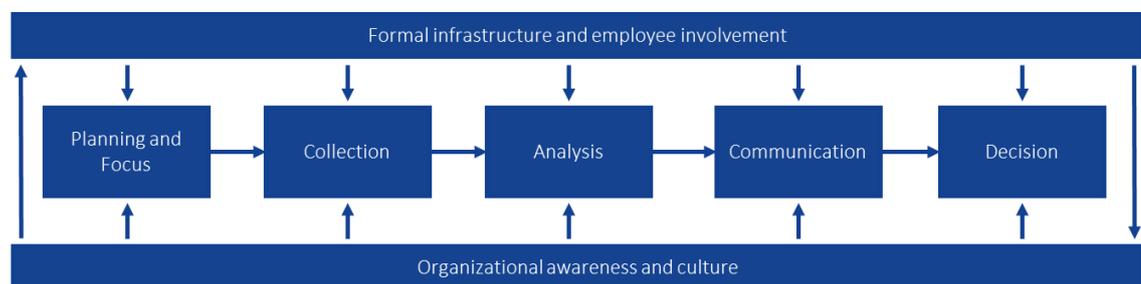
According to Pellissier and Nenzhelele (2013), CI is a process that includes stages linked to each other that lead to an input for decision-making processes by providing actionable intelligence. (Pellissier & Nenzhelele 2013, p. 2) Nasri (2012) states that CI is a continuous process in which the competitive information will be gathered and the information eventually interacts with the organization. Thus the intelligence boost the competitiveness of the organization through better decision-making. (Nasri 2012, p. 26) Although the interpretations may vary, there are common generic and similar phases that associate with most of the intelligence processes. These include:

- Collecting publically available data and information
- Analyzing data and information by using different analytical tools in order to convert it into actionable intelligence
- Disseminating the intelligence to the ones who are responsible for decision-making. (IMA [1] 1996, p. 4; Lemos & Porto 1998, p. 331; McGonagle & Vella 2012, p. 9; Nasri 2015, p. 28)

Bartes (2013) defines the CI practice in the business context as a process of four different stages: Competitive intelligence and management, collection, analysis and distribution of intelligence. (Bartes 2013, p. 283). Likewise, yet in a slightly different order, Albescu et al. (2008) suggest the CI has four steps consisting of collecting the information, converting the collected information into intelligence, communicating the intelligence and finally, using the intelligence. (Albescu et al. 2008, p. 3)

Again, these standpoints get supported by Dishman and Calof (2008), Ding (2009), Nasri (2012), as well as Chouder and Chalal (2014) who describe the intelligence process as a process of four stages. These phases consist of planning and focusing the intelligence process, collecting the information from varying sources, creating the intelligence by analyzing the information and communicating the results to those with the authority and responsibility to act in regard to the created intelligence. In addition, there should be proper policies, procedures and either formal or informal structures to ensure that every employee can contribute to the process, yet being able to benefit from it. Again, being conscious of the CI activities and the culture of competitiveness are essential to make the best of CI. (Dishman & Calof 2008, pp. 768-770; Ding 2009, p. 328; Nasri 2012, pp. 26-30; Chouder & Chalal 2014, p. 1) However, Bartes (2013) argues that the four-phased approach is more suitable for simple CI processes and for particular organizations. However, as the world has become more global, CI is facing more challenging tasks. The author also believes the weaknesses of the four-phased model is the disparity of data or information. (Bartes 2013, p. 283)

As the structure of an intelligence process seems to be rather congruent along the literature, the main phases can be constructed as a conclusion (Figure 3) in which the formal infrastructure, as well as organizational awareness and culture have been taken into account.

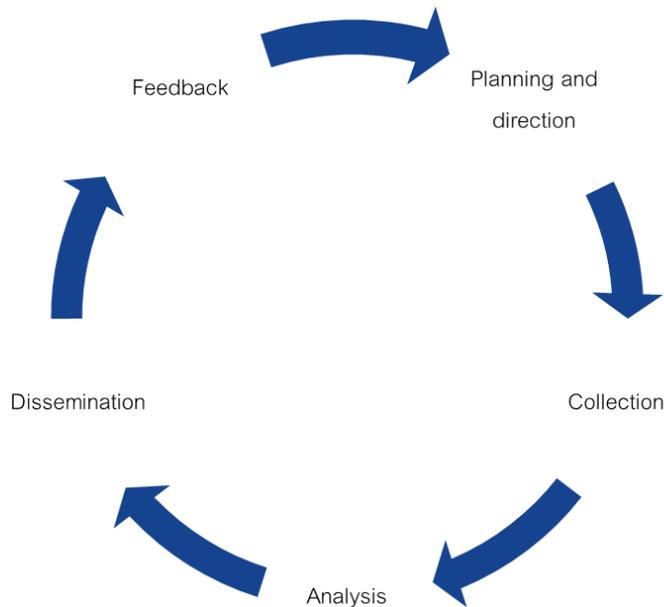


**Figure 3.** General phases of a CI process (adapted from Dishman & Calof 2008; Nasri 2012)

The figure summarizes the high-level steps to take when executing a CI process. After the observation of the literature it can be stated that the characteristics in the figure are undeniably common across the literature regarding CI practices. Most notable support for the theory come from Albescu et al. (2008), Dishman and Calof (2008), McGonagle and Vella (2012), Nasri (2012), and Barters (2013). The illustration also corresponds with CI cycle, to be observed in the following chapter.

### 3.2 CI Cycle

The CI process is often associated with the intelligence cycle (or intelligence circle), which refers to five different steps that form a continuum of an intelligence practice (Figure 4).



**Figure 4.** *Intelligence Cycle (adapted from Bose 2008, p. 513)*

This presentation is likely to be one of the most common ways to describe the CI process, including the steps of planning and direction, collection of information, analysis, dissemination of the intelligence and feedback. (Benczúr 2006, p. 41; Bose 2008, p. 513; Pellissier & Nenzhelele 2013, pp. 4-6; Fleisher & Bensoussan 2015, p. 11)

The cycle begins by planning the intelligence initiative and setting a direction for it. During the phase the information needs are established and the end user requirements are recognized. The second phase consists of the gathering of data and information. The phase is mainly about forming the key questions and identifying the most appropriate data sources for the process. The third step is for evaluating and analyzing the gathered data. The evaluation improves the information quality whereas the analysis will turn the information into actionable intelligence. In the fourth phase the intelligence is communicated to the people who need it. The final phase includes reviewing the intelligence initiative and the feedback will be used to direct the further CI activities. The feedback phase also enables the opportunity to review original intelligence requests and provides the CI practitioner with constructive feedback that creates conditions for continuous improvement. (Albescu et al. 2008, pp. 3-6; McGonagle & Vella 2012, pp. 10-11; Nasri 2012, pp. 27-28; Pellissier & Nenzhelele 2013, p. 5)

These steps construct the main steps for CI initiatives. Firstly observed by Dishman and Calof (2008), and later on by Nasri (2012) and Pellissier and Nenzhelele (2013), the cycle has been supplemented by the process infrastructure, organizational awareness and the organizational culture regarding CI practices. These aspects point out that intelligence processes require appropriate policies and procedures that employees could contribute effectively to them. In addition, the management support is needed to set the intelligence activities to the required level of priority. (Dishman & Calof 2008, p. 779; Nasri 2012, p.

29; Pellissier & Nenzhelele 2013, pp. 4-5) In the thesis, however, the CI process is primarily intended to be a single intelligence initiative and thus it is not necessarily a starting point for an organizational process. Therefore, with regards to the organizational awareness and culture, the process does not involve any employee besides the author and certain managers.

The CI cycle is the framework used in the empirical study. The choice of the process model is also due to the last phase which involves the feedback instead of the implementation of the intelligence into practice – the thesis take the further decision-making processes within the target organization into account.

### 3.2.1 Planning and Direction

As the competitive landscape has faced a remarkable growth and the complexity of the business environment has increased, the intelligence needs have to be properly defined. (Blenkhorn & Fleisher 2005, p. 18) Therefore, the first phase enables a general direction for the process ensuring that only relevant information is gathered and analyzed in accordance with the intelligence requirements. (Nasri 2012, p. 27)

The first phase of the process includes the clarifications on what will be done, and how. During the planning the most essential intelligence needs are being established and a specific direction will be taken in order to fulfill the needs. (IMA [1] 1996, p. 4; CIA 2015) João (2012) specifies that the planning and direction phase includes the identification of needs, the establishment of an initial plan for data collection and analysis, and at the same time, the end user is informed about the initial decisions. (João 2012, p. 3) Moreover, the planning phase is used as a base of resourcing regarding the CI initiative. (Dishman & Calof 2008, p. 768)

The planning necessitates the identification of end user requirements. The type of the business issue – for example a strategic, tactical or marketing related one – motivates the task, and affects the nature of the answers the end user is looking for. (McGonagle & Vella 2012, p. 10) Therefore, certain questions and decisions are being asked and made on, for example:

- What kind of issue is being considered, and what is already known
- Which are the major questions to be answered
- Who will use the intelligence
- In what circumstances, and when the intelligence is appropriate

The CI approach should be aligned roughly with a certain strategic plan. Also, the focus should primarily be on the issues which hold the highest value. (Albescu et al. 2008, p. 3; Bose 2008, p. 513; McGonagle & Vella 2012, p. 10; Nasri 2012, p. 27; CIA 2015)

In order to gain a clear picture of the intelligence priorities, the intelligence needs should be properly evaluated. The analysis of Key Intelligence Needs (KINs), or Critical Intelligence Needs (CINs), ensure that companies have a good understanding of the changing CI needs. It may help CI practitioners to identify the issues with the highest importance within an ever expanding marketplace. (Blenkhorn & Fleisher 2005, p. 18)

Key Intelligence Topics (KITs) represent the topics that hold the highest significance for the executives, senior managers and other decision-makers. Thus these topics will necessitate the importance of the CI initiative and provide the desired direction for the practice. (Bose 2008, p. 513) Therefore, the identification of KITs, and hence the formation of planning, direction and objectives, is done by management. (Blenkhorn & Fleisher 2005, p. 19)

Various CI academics have categorized KITs into three functional types, namely, strategic decisions and actions, early warning topics and the descriptions of key players. The topics defined by clients are categorized into these sectors to understand their needs better and to organize the CI activities of the organization. (Herring 1999, p. 6; Blenkhorn & Fleisher 2005, pp. 19-22; João 2012, p. 3; Nasri 2012, p. 27)

#### Strategic KITs

The category contributes to the development of strategic plans and strategies, often regarding the strategy formulation and implementation. This requires identifying and meeting the specific needs of decision-makers. The KITs might vary e.g. from specific questions to decision statements and these topics are particularly applicable when considering, for example, planning a strategic investment, alliances and acquisitions or an expansion into global markets. Practically, the methods include competitor and partner profiling, and risk and opportunity assessments, developing product specific strategies, for example. (Herring 1999, p. 6; Blenkhorn & Fleisher 2005, pp. 20-21; Nasri 2012, p. 27)

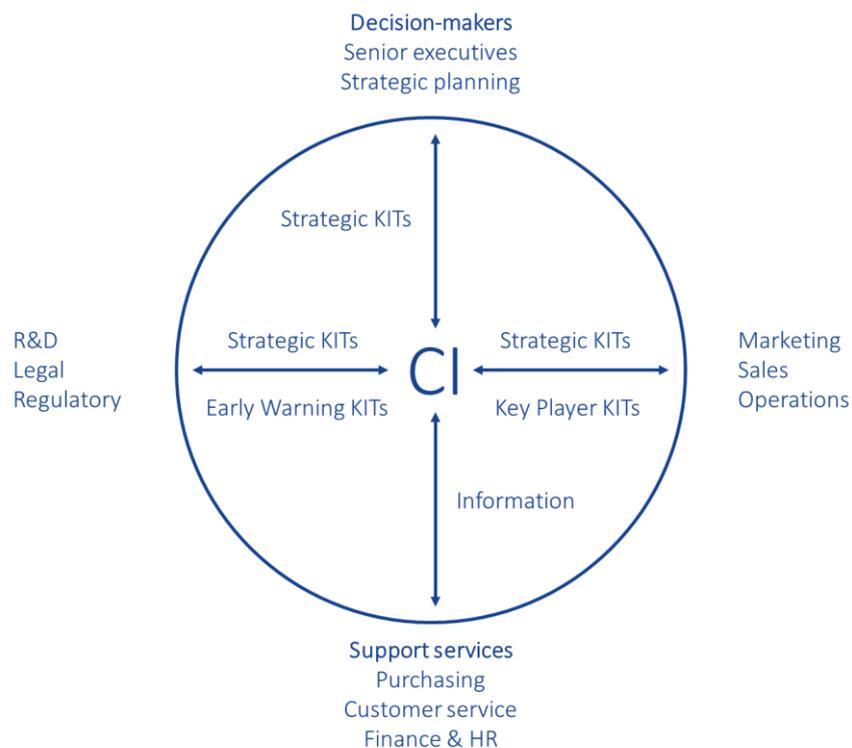
#### Early warning KITs

Early warning topics consist of the threats arising from the rivals' initiatives, technological surprises, and actions by the government, for instance. These topics represent the changes that the management does not want to get surprised of. In other words, early warning topics are a way to handle potential threats. The methods might include for example business, political and economic tracking, continuous follow-up on the major competitors, and being generally aware of the business climate. (Herring 1999, p. 6; Nasri 2012, p. 27)

## Key player KITs

Key player topics arise from the emergent rivalry, including the existing industry, the threat of entrants and substitute products. Key player KITs consist of descriptions of the key players in a certain marketplace, including e.g. competitors, suppliers, customers, regulators as well as potential partners. The category is intended for the better understanding of the players. The KITs can vary depending on the needs and sophistication of the management teams. The practical tools might include for example monitoring the sales, investments and partners of competitors, tracking the suppliers and subcontractors in the market, and providing competitive review and profiles on strategies, operations, R&D, branding and marketing of the key players. (Herring 1999, p. 6; Nasri 2012, pp. 27-28)

These KITs may be interrelated. For instance, the strategic decisions might require the input of the key player topics whereas the early warning topics might evolve into strategic KITs. (Blenkhorn & Fleisher 2005, p. 22) The classification described, however, is not the only of the type. CI functions have previously been divided into offensive, defensive and informational types of KITs. Another classification is to divide CI functions into an intelligence support for management, tactical field support, and a passive monitoring system. (Blenkhorn & Fleisher 2005, p. 20) The following figure (Figure 5) shows the interactions within the KIT process.



**Figure 5.** Key interactions of the KITs Process

As shown in the figure, the KIT identification involves two-way communication between relevant parties, especially between the end user and the CI specialist. The aim is to find a common understanding of the critical intelligence needs, and this can be done through a non-directive and open discussion between the CI practitioner, managers and higher executives. The better the articulation is, the better the outcomes of the CI process will turn out to be. Moreover, identifying the most appropriate needs might involve working with the people who will be exploiting CI. (Blenkhorn & Fleisher 2005, p. 19; Bose 2008, p. 513)

As an output, the planning and direction phase of the intelligence cycle provides an initial base of information and decisions related to the CI initiative. The latter phases will base on the determinants that are formed during the first phase.

### 3.2.2 Selection

The second step of the CI cycle consists of the identification of potential information sources and the information gathering. (Liebowitz 2006, p. 60; Albescu et al. 2008, p. 3; McGonagle & Vella 2012, p. 10) Albescu et al. (2008) and Nasri (2012), there are internal and external sources for competitive information which can also be split into primary and secondary sources. (Albescu et al. 2008, pp. 3-4; Nasri 2012, p. 28) Acquiring information from *primary sources* refers to the process in which the information is gathered straight from the source itself. Therefore, it often associates with interviews with individuals or acquiring the information from a certain dataset or a document. Primary sources in terms of individuals cover usually a variety of relevant stakeholders, for example professionals, colleagues, suppliers, government agencies and other stakeholders. The secondary sources instead are not acquired directly from the original source. Hence, secondary sources cover newspaper articles, industry studies and quotes made by other people. Secondary sources often consider general data and information acquisition from public sources. (Liebowitz 2006, p. 60; Albescu et al. 2008, pp. 3-4; Nasri 2012, p. 28)

The variety of information sources is enormous. Especially due to the Internet era, the amount of publically available data has been accelerating. (Benczúr 2006, p. 38; Albescu et al. 2008, p. 5) According to Benczúr (2006), it is estimated that ca. 90 percent of strategically relevant information is freely available and legally accessible on the Internet. Moreover, Internet consists of several different tools, for instance search engines, metasearch engines, databases, online directories, vertical portals, to name few. (Benczúr 2006, pp. 37-38)

Johns and Van Doren (2010) suggest that there are four main information sources for competitive purposes and by exploiting them, many of questions can be answered. These sources are

- People one knows: Colleagues, associations and membership organizations

- Public information: Websites, customers, press releases and interviews
- Direct sources: Market researches, collaborative projects and industry analysis
- Personal experiences: Hiring from rivals and work experience (Johns & Van Doren 2010, pp. 557-559)

Johns and Van Doren are supported by the Institute of Management Accountants as they propose that the key sources for competitive data are internal staff, published information, 3rd party interviews and commissioned research. (IMA [1] 1996, p. 5)

The choice of a source depends highly on the type of information. The factors affecting the choice are, for example, the ease of use, processability, cost and availability of information, as well as quantity and quality of information. (Nasri 2012, pp. 28-29) Also, the constraints regarding the CI process, for instance financial, time, informational and legal aspects, should be taken into account. (Albescu et al. 2008, p. 3; McGonagle & Vella 2012, p. 10)

The information is gathered from a great variety of sources and by using a number of available acquisition techniques. (Dishman & Calof 2008, p. 768; Nasri 2012, p. 28) Typically, the analysts have to rely both impersonal external sources (e.g. annual reports, market analysis reports), as well as personal sources inside and outside a firm. (Jaworski et al. 2002, p. 284) The CI process proceeds, by its definition, in a legal and ethical manner and finally, the collected information will be organized. (Bose 2008, p. 513) The gathered information will be synthesized and distilled into manageable sets, which however, does not mean the information is analyzed. The analytical aids, for instance scenario planning, SWOT analysis or balance scorecard and other techniques, may be used later on. (Liebowitz 2006, p. 60)

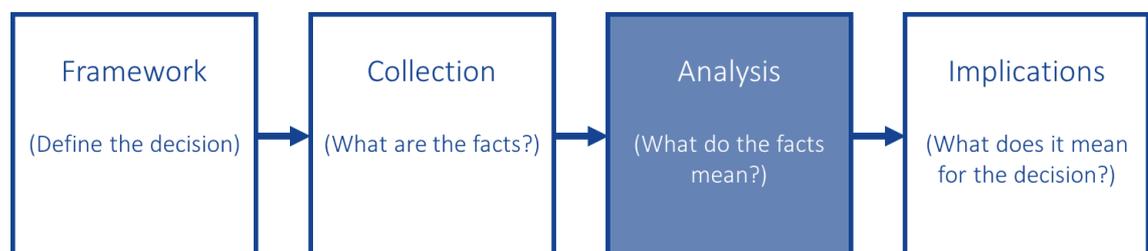
According to Jaworski et al. (2002), the efficacy of the information gathering can be determined through four variables: Efficiency, accuracy, comprehensiveness and timeliness (Jaworski et al. 2002, p. 285). The process is efficient when, for instance, the level of the use of time, money and human resources were relatively low. The accuracy, hereby, reflects the validity of information that has been gathered from search. The information should accurately answer the question that the person was looking for answer to. Again, comprehensiveness refers to the extent that the obtained information is useful for the particular purpose. Finally timeliness is a measure for to what extent does the information stay relevant when the decisions are being made. (Jaworski et al. 2002, pp. 285-286) Also, Nasri (2012) emphasizes accuracy, comprehensiveness and timeliness of information. However, these are only few of the whole set of characteristics that the author refers as quality of intelligence (or information). The other attributes are clarity (information is understandable or comprehensive enough for the target group), depth (information is sufficiently detailed), and relevance (the extent the knowledge is applicable to the requirements of a decision-maker). (Nasri 2012, pp. 28-29) Furthermore, Bose (2008) underlines

the accuracy, relevance and timeliness. Moreover, the author adds the usability and readiness to the group of important characteristics of competitive information. Usability refers to intelligence that facilitates immediate understanding of the content and is ready to be applied. Readiness means that the CI system must be responsive to those decision-makers who require intelligence. (Bose 2008, p. 512)

### 3.2.3 Analysis

In terms of the intelligence produced, the analysis of information is a highly decisive step of the intelligence process. By using educated procedures and the analyst's experience, the conventional information regarding the issues will be turned into intelligence. (Bartes 2013, pp. 285-286) Therefore, the collected information is not only ordinary information about the defined problem, but it provides a sophisticated answer to the problem.

Therefore, the third stage of the intelligence cycle is for the analysis of the collected data and by doing that, the data will be turned into actionable and useful intelligence. (Dishman 2008, p. 769; Nasri 2012, p. 28) According to Bose (2008), the translation from a raw data into actionable intelligence refers to the process of evaluating and analyzing the information in a way that the relationships, patterns and variances in it will be identified. (Bose 2008, p. 513) The analysis can also have different objectives, for instance the analysis can be conducted to identify the valuable information from masses of data or, to add value for the gathered information. (Albescu et al. 2008, p. 5; McGonagle & Vella 2012, p. 10; Nasri 2012, p. 28) Jaworski et al. (2002) instead, call the third phase of the CI generation process as sense-making through which insights about competitive activities can be obtained. (Jaworski et al. 2002, p. 286) Nasri (2012) states the third stage of the CI process is the most difficult one. If applied correctly, the analytical tools may change the disparate pieces of data and information into intelligence. (Nasri 2012, p. 28) The Figure 6 shows how the analysis positions into an intelligence initiative.



**Figure 6.** General approach to analysis (adapted from Fleisher & Bensoussan 2002)

Analysis answer the questions on what does the collected data mean, and why is it useful. Here, an individual interprets the data and information in order to provide important insights. Thus the analysis includes evaluating trends and patterns, deriving correlations and weighing opportunities available to firms. (Fleisher & Bensoussan 2002, p. 12)

All in all, the analysis is mainly about the examination of the stored data, information, and knowledge in accordance with their importance and applicability, which ideally will improve the decision-making or planning processes and thus enabling sustainable competitive advantage. Further, the most valuable analyses call for creativity and insight, as well as the capability to look beyond the apparent. Finally, the analysis provides a recommendation for the action considered. (Bose 2008, p. 513)

In order to cope with the increasing rivalry impacting most of the industries, a broad range of different tools, practices and techniques have been developed over the years. A number of analytical tools can be used to support the conduct of CI. (IMA [1] 1996, p. 9) Institute of Management Accountants (1996) propose to split analytical tools into five different approaches, explicitly, strategic, product-oriented, customer-oriented, financial and behavioral techniques. (IMA [1] 1996, p. 9) Fleisher and Bensoussan (2002) suggest a slightly broader categorization, by dividing the techniques into strategic, competitive and customer centered, environmental, evolutionary and financial analyses. (Fleisher & Bensoussan 2002) Many of the authors, for example Albescu et al. (2002), Bose (2008), Pellissier and Nenzhelele (2013), as well as Chouder and Chalal (2014) emphasize the development of CI through strategic analyses to create meaningful intelligence. (Albescu et al. 2002, p. 6; Bose 2008, p. 519; Pellissier & Nenzhelele 2013, p. 4; Chouder & Chalal 2014, pp. 2-4)

It is important for an individual conducting a business analysis to find the most appropriate techniques to support the analysis of an issue. Therefore, it is essential to recognize a range of different analytical tools that could help the practitioner to develop meaningful intelligence. By knowing a versatile set of options, an individual may recognize a technique that has the best fit for the analysis, and the one that contributes to the analysis in a way that the intelligence needs can be fulfilled. To do this, a research on analytical tools is conducted as follows. Firstly, the table (Table 2) shows the literature that were used as the basis for the examination on analytical tools.

**Table 2.** *The authors of the observed literature on analytical techniques supporting the conduct of CI*

#	Author(s)
[1]	Albescu et al. (2008, p. 6)
[2]	Bensoussan & Fleisher (2013)
[3]	Bose (2008, p. 519)
[4]	Chouder & Chalal (2014, pp. 2-4)
[5]	CIMA (2007)
[6]	Fleisher & Bensoussan (2002)
[7]	Fleisher & Bensoussan (2015)
[8]	Gaspareniene et al. (2013)
[9]	IMA (1996)
[10]	Lemos & Porto (1998)
[11]	Murphy (2005)
[12]	Nasri (2012)
[13]	Pellissier & Nenzhelele (2013, p. 4)

The studied literature cover thirteen sources, which all of the suggested different amounts of varying techniques to be used. Some of the authors appear more than once, but their publications also suggest different analytical methods to be used. These authors, especially Fleisher and Bensoussan, do have a remarkable track of literature on the conduct of CI and thus they are a great sources to evaluate different options to perform an analysis.

The Table 3 illustrates the actual findings on different analytical techniques, showing the occurrences of the methods across the examined publications. The table follows the numerical coding of authors, as shown in the table above.

**Table 3.** Occurrences of different CI related analyses across the reviewed literature

Name	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	#
Porter's Five Forces (Industry Analysis)														11
SWOT Analysis														10
Macroenvironmental (STEEP/PESTEL)														8
Value Chain Analysis														8
Competitive Benchmark														6
Financial Ratio and Statement Analysis														6
BCG Growth Matrix/Share Portfolio Matrix														6
Scenario Analysis														5
GE Business Screen Matrix														4
Competitor Profiling														4
Shadowing														3
Customer-/Market Segmentation Analysis														3
Product Life Cycle Analysis														3
Customer Value Analysis														2
Functional Capability and Resource														2
Competitor Analysis														2
Issue Analysis														2
Sustainable Growth Rate Analysis														2
Reverse Engineering/Teardown Analysis														2
Strategic Group Analysis														2
Win/Loss Analysis														2
War Gaming														2
Future Analysis														2
Key Success Factors														2
Blindspot Analysis														2
Management Profiling														2
Experience/Learning Curve Analysis														2
Growth Vector Analysis														2
Patent Analysis														2
Technology Life Cycle Analysis														2
Psychological Profiling														1
Stakeholder Analysis														1
Strategic Funds Programming														1
Competitive Cost Analysis														1
Driving Forces Analysis														1
Industry Classification Analysis														1
Core Competencies/Capabilities Analysis														1
Early Warning Scans														1
Porter's Four Corner's Analysis														1
Event Timeline Analysis														1
Industry Scenario Description														1
Gap Analysis														1
Competitive Positioning Analysis														1
SATELLITE														1
	7	12	8	11	7	24	6	17	13	4	6	6	4	

According to the table above, SWOT analysis, Porter's five forces and Value chain analysis seem to be rather common across the literature. PEST analysis, scenario analysis and financial ratio analysis, for instance, are also often referred to. Out of all the 44 observed methods, 31 tools are mentioned only twice or less whereas 14 of the methods are mentioned only once. Through this observation it can be assumed that there is a broad range of tools than found in this study, but the most popular techniques dominate, at least, the

observed literature. Probably, many of the analytical tools are used for more specific use cases and thus were not included in the literature. Further, due to the popularity, the well-known techniques and frameworks provide the decision-makers with a common language and the ease of use.

### **3.2.4 Dissemination**

Dishman and Calof (2008) state the findings of the CI process should be disseminated to those who are authorized to act on the results, and emphasize the importance of the proper distribution of intelligence to the decision-makers. (Dishman & Calof 2008, p. 769) The dissemination part of the intelligence process includes reporting and informing the relevant parties. The CI is communicated to stakeholders in an understandable and interpretable format that might take the form of a report or a dashboard. Besides, the intelligence can be distributed through a meeting. (Bose 2008, p. 514) Also, Nasri (2012) mentions that intelligence products should be distributed in a presentable form and to those who requested it. (Nasri 2012, p. 28)

There is often a certain client for each CI initiative. The client can also determine more stakeholders who should receive the intelligence report in its final form. The distribution of the document is executed in accordance with the firm's rules, for instance taking the rules of protection and information security into account. This often means that the document is labeled and the level of classification is indicated. If CI activities are a routine, a fixed list of receivers can be created. (Bartes 2013, p. 285)

### **3.2.5 Feedback**

Feedback is the concluding phase of the intelligence cycle. Practically, the relevant stakeholders have already studied the final report prior to giving feedback and they might present additional questions regarding the findings. Therefore, the feedback phase includes evaluating the impact of the intelligence from the decision makers' perspective. Further, these questions might launch a new CI initiative in order to conduct a research on the questions that came up during the review. (Bose 2008, p. 514; Bartes 2013, p. 286)

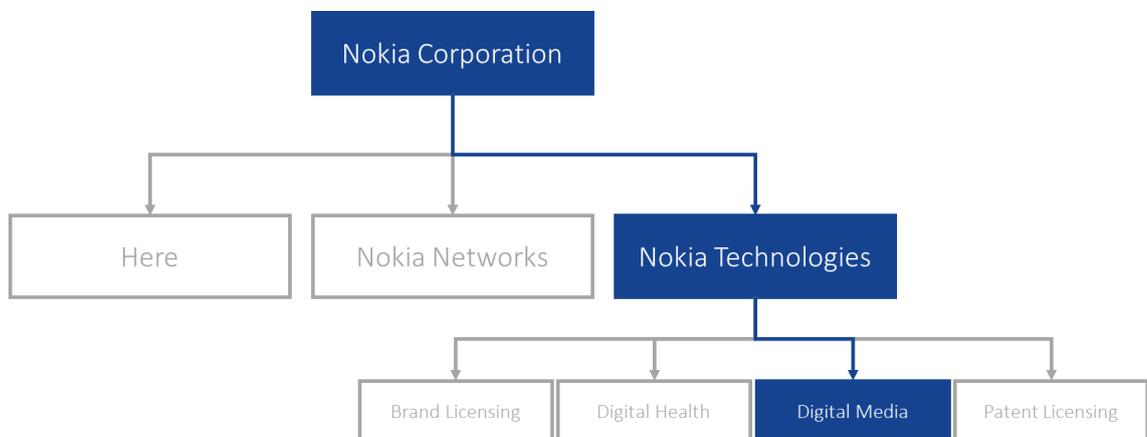
The feedback phase includes a proper evaluation of the intelligence initiative and the assessment of the effectiveness in terms of decision-making. Hence, the decision-maker should be responsible for providing the feedback. The phase is important in order to develop and improve the future CI plans, and to evaluate and reassess the organizational strategy. (Nasri 2012, p. 28)

## 4. INTRODUCTION TO EMPIRICAL STUDY

The chapter 3.1 introduces the target organization, and will be followed by an introduction on virtual reality. Finally, the chapter 3.3 is to clarify the motivation to examine and use the CI process. The objective of these chapters is to define the context in terms of target organization and marketplace, and to necessitate the importance of chosen approach.

### 4.1 Target Organization

Nokia is one of the leaders in the field of network technologies, location-based services and advanced technologies. Nowadays, Nokia's business is divided into three main areas that are ran by its subsidiaries Nokia Networks (network infrastructure business), HERE (navigation and location intelligence business) and Nokia Technologies (technology licensing and intellectual property rights services). The structure is presented in the Figure 7. Currently, Nokia has a significant global presence with over 61 thousand employees around the globe and the firm has a notable effort on research and development of 2.5 billion euros (2014) across the corporation. Nokia's net sales were at 12.7 billion euros in 2014. (Nokia [1-3] 2015)



*Figure 7. Nokia Corporation, Nokia Technologies and its businesses – the thesis serves the interests of Digital Media*

Nokia Technologies focuses on the development of Nokia's innovation portfolio through technology licensing and patent licensing program. Also, Nokia Technologies helps customers to benefit from the value of Nokia brand through brand licensing, starting with Nokia N1 tablet. All the activities are being supported by Nokia Labs R&D team with a strong presence in connectivity, multimedia, imaging, sensing and material technologies, audio, cloud and web technologies. Nokia Technologies' revenue was 578 million euros in 2014 and the first quarter of 2015 showed a year-on-year growth of 103 percent. (Nokia

[1-3] 2015) The firm recently announced a new VR camera OZO targeting to professional content creators. Thus the thesis serves the interests regarding Nokia Technologies' Digital Media unit.

## 4.2 Virtual Reality

When it comes to virtual experiences and environments, the concept of 'being there' is certainly important. (Bailey et al. 2011, p. 1) This is what an immersion is about: Delivering an authentic feeling of an event to the end user, as if the person was actually present in the event being recorded. (CEA 2015, p. 20)

Virtual Reality (VR), also known as Immersive Multimedia, is often defined as a computer-enabled simulation of a physical presence of a user in either a virtual or real-life environment. The immerse of a virtually-imagined reality can be enhanced by reconstructing sensory experiences regarding senses such as touching, hearing, seeing and smelling, for instance. (Bailey et al. 2011, p. 5; Immersive Education 2015) Furthermore, VR is closely related to immersive virtual environment (IVE). IVE is an environment perceptually surrounding the user, either adding more features to the reality, known as augmented reality (AR), or totally creating a new virtual environment. People can connect with the virtual environment by utilizing different channels, for example visual (e.g. a head-mounted display), haptic (e.g. interactive gloves to contact the environment), auditory (e.g. earphones for localizing the sounds in VEs) or even olfactory (e.g. devices omitting smells when perceiving certain objects within a VE). (Bailenson et al. 2008, pp. 103-104)

Starting from the gaming industry, virtual reality is also expanding into real-life as recent VR cameras are able to capture immersive content of real-life events. Thus the short term future will provide people with immersive 360 experiences regarding sport events, music festivals or even family events, for instance. (CEA 2015, p. 20) Yet, the idea of the virtual reality is not new. The idea of an immersive computer comes from the 1960. The first prototypes were rough, primitive and costly, usually built for military and governmental purposes. (CEA 2015, p. 20; Forbes [1] 2015)

As of the early 2015, the markets for the VR did not, to some extent, really exist. (UploadVR 2015). Nevertheless, it has been recently announced that there is increasing marketplace for VR products, at the moment due to the convergence between VR and mobile technologies. (Virtual Reality Reviewer 2014; MIT Technology Review 2014). The thought on VR as a viable market started to shape basically in 2014. There are a number of examples of VR technologies throughout the last few decades, however, most of the VR projects failed due to lack of technical development, or faced at least a commercial failure. In 2014, the public audience paid attention to Facebook's acquisition of the crowd-funded VR firm Oculus. Soon some major technology providers, for example

Google, Sony and Samsung announced their own VR efforts, some of them being shown in the Figure 8. (Cinematography Database 2014; Design to Improve Life 2015)



**Figure 8.** *Examples of recent head-mounted displays (HMDs), starting from Google Cardboard (Google), Oculus Rift (Oculus), Project Morpheus (Sony) and Gear VR (Samsung)*

The attention has been recently mostly on head-mounted displays (HMDs), which already cover a considerable amount of offering either in terms of already published, or up-coming products. HMDs are mainly targeted for consumers, as in the figure above. Samsung was among the first ones to announce a technically advanced HMD with its Gear VR, and players such as Facebook with its Oculus subsidiary and Sony's Project Morpheus, are coming right behind, being expected to be launched in early 2016. (Virtual Reality Reviewer 2014; Design to Improve Life 2015). The starting point of the thesis work, however, is the VR camera industry and the operations that follow the content capture (Figure 9).



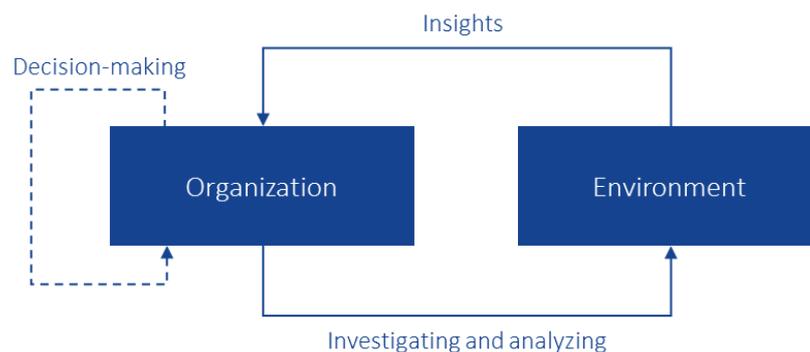
**Figure 9.** *Cameras for capturing 360-degree video content*

Related to the scope, the market of VR broadcasting is predicted to increase significantly during the upcoming two to five years. Along this period the amount of connected devices with sensors in them will increase everywhere, and the connectivity is seen to accelerate the market. The first movie in 360 degrees has already been shot and concerts in a live

VR broadcast have been recorded. (MIT Technology Review 2014; CEA 2015, p. 20; Forbes [1] 2015)

### 4.3 Motivation to Use Competitive Intelligence

The aim of the work is to execute an analysis of a dynamic business environment that is growing in a fast pace and in which the competition seem to be uncertain. According to Johns and Van Doren (2010), CI is a significant source of information for business planning and related activities as it provides information about the competitors and business environment now and in the future. (Johns & Van Doren 2010, p. 553) The need for a proactive intelligence initiative is reasonable as staying up-to-date on the market conditions require a robust information gathering by using various information sources, and an adequate analysis to develop meaningful insights. Another reason was the decision to analyze the marketplace by using only external information sources. Due to its possible sensitivity, the use of internal information was out of consideration. The developed intelligence would be used as an input for decision-making in the strategy work, as presented in the Figure 10.



**Figure 10.** *The purpose of the empirical part of the work*

A strong focus on competitive environment before the stabilization of the market might allow novel and strategically relevant insights, and makes the target company more aware of environmental threats. The research might also uncover factors, or raise questions that will facilitate further CI activities in the firm.

## 5. APPLICATION OF THE INTELLIGENCE CYCLE

In this chapter, the previously introduced intelligence cycle (see chapter 3.2) will be applied in practice. The cycle is conducted phase-by-phase, and every step is explained in detail. The purpose of the empirical study is to provide a view on how well do CI practices serve the interests of the target organization, and the objectives that will be set during the process.

### 5.1 Planning the Process

The first phase of the CI cycle consists of limitations and scoping, the definition of the KITs, as well as the pre-selection of the analytical tools. Thus the chapter also includes a theoretical observation on the chosen analytical techniques.

#### 5.1.1 Limitations and Scoping

It is necessary to start by doing certain limitations on how the business analysis is conducted in the CI process. The scope is limited to a high-level observation of the market as illustrated in the Figure 11.



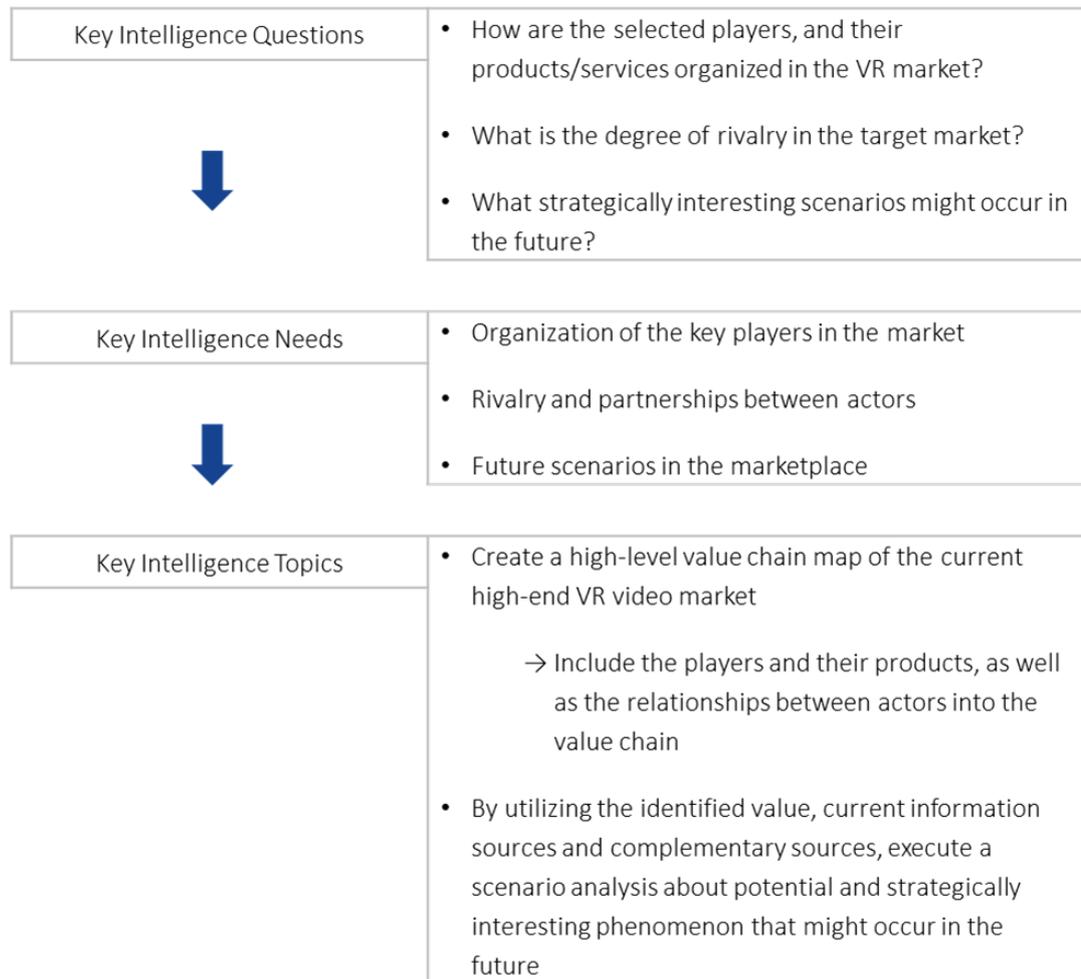
*Figure 11. A high-level limitation from the value chain's perspective*

The scope includes the phases from the production of immersive multimedia content (by using a certain camera device such as a spherical VR camera or a rig consisting of multiple cameras) to the delivery of the captured content (by processing the digital content, storing and distributing it further) and finally, to the consumption of the content by the end user (by using for example a head-mounted display). The high-level observation is divided into more detailed aspects as well, for instance the delivery of the content includes the findings on image processing software, storing solutions, and distribution channels.

#### 5.1.2 Defining Key Intelligence Topics

João (2012) proposes that the Key Intelligence Needs (KINs) should be identified in the first place, and this is done with the help of Key Intelligence Questions. Through the

recognized needs, the KITs can be formed. (João 2012, p. 3) The KITs are presented in the Figure 12.



**Figure 12.** *The identification of KITs*

As the figure shows, the first step is to form the most important questions which examine the issues within the predefined scope and limitations of the study. After this, the most important intelligence needs for the intelligence process are determined. Finally, the final KITs are created in the form of an action plan to fulfill the intelligence needs.

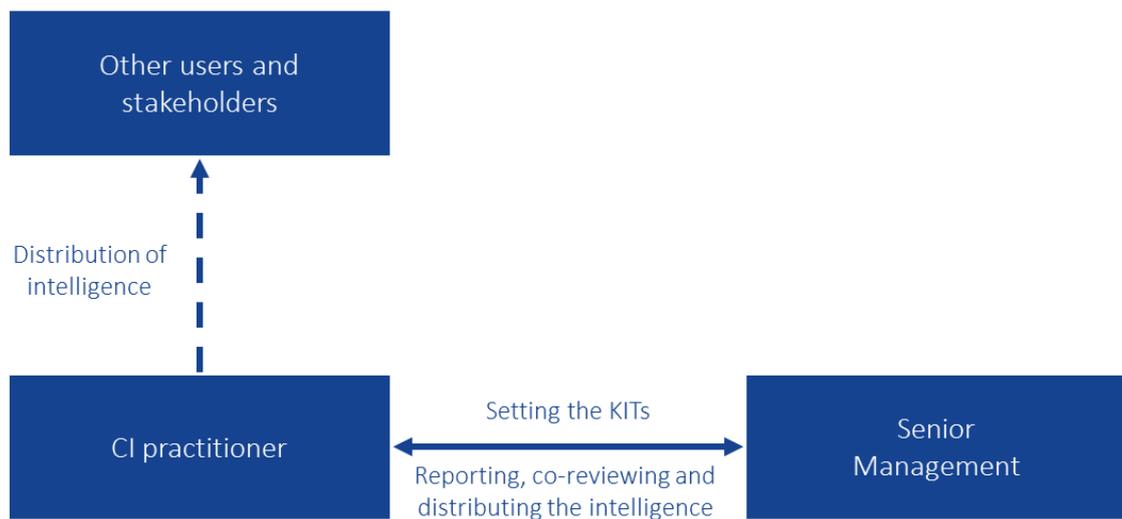
According to previously described three categories of KITs (see chapter 3.2.1), the focus will be on the *Key Player KITs*. The choice is done in accordance with the main interest in the general understanding of the marketplace, yet recognizing the most notable players within the scope. The study does not necessarily distinguish the current and future players in the market only as potential rivals, but strives to consider them also possible suppliers, customers, or partners.

In order to answer intelligence requirements, some analytical tools have been pre-selected. The intention is to use *value chain mapping* as a first analytical tool that will help to clarify the value-adding processes within the observed marketplace. The use of the tool

intends to reveal the market structure among the chosen players and through that knowledge high-level insights can be made. The notations will be adapted from the literature, and the goal is to create one high-level map of the industry value chain that includes the chosen players in the market.

The second tool will be a *scenario analysis*. The aim of the creation and analysis of scenarios is to discover potential and interesting future situations in the market. The analysis is performed by utilizing the findings of the value chain mapping, and complementing the knowledge with additional information derived from supplementary sources. These scenarios will be analyzed in terms of probability of the scenario, potential impact of them and thus evaluating the importance of these scenarios. The methods are introduced in the chapters 5.1.3 and 5.1.4.

The communication during the process occurs between the author of the work as a CI practitioner, and the senior management of the target company. The communication during the conduct of CI is illustrated in the Figure 13.



**Figure 13.** *Communications and interactions during the CI initiative*

The communication includes a mutual goal-setting and KIT identification with the senior management, as well as the frequent reporting during the process, to be eventually concluded with a final report. The end results might be delivered to a broader audience, especially to those who could have any use for the knowledge.

In order to meet the objectives – determined through KITs – the following methods have been chosen for the analysis phase. The following sub-chapters introduce the theoretical frameworks of the methods to be applied into practice later on.

### 5.1.3 Theory on Value Chain Mapping

In order to survive in a dynamic and fierce business environment firms must deliver products that attract customers. In order to do so, the whole value-adding manufacturing process should be taken into consideration as an organization might find, for instance, novel approaches for management, needs for new technologies or changes in the production process. The phases within a process of producing goods or services add more value for the end users, and the competitive advantage occurs from the difference between the value delivered to customer and the costs arising from the value being created. (IMA [2] 1996, p. 2; Crain & Abraham 2008, p. 29; Kirli & Gümüş 2011, p. 307)

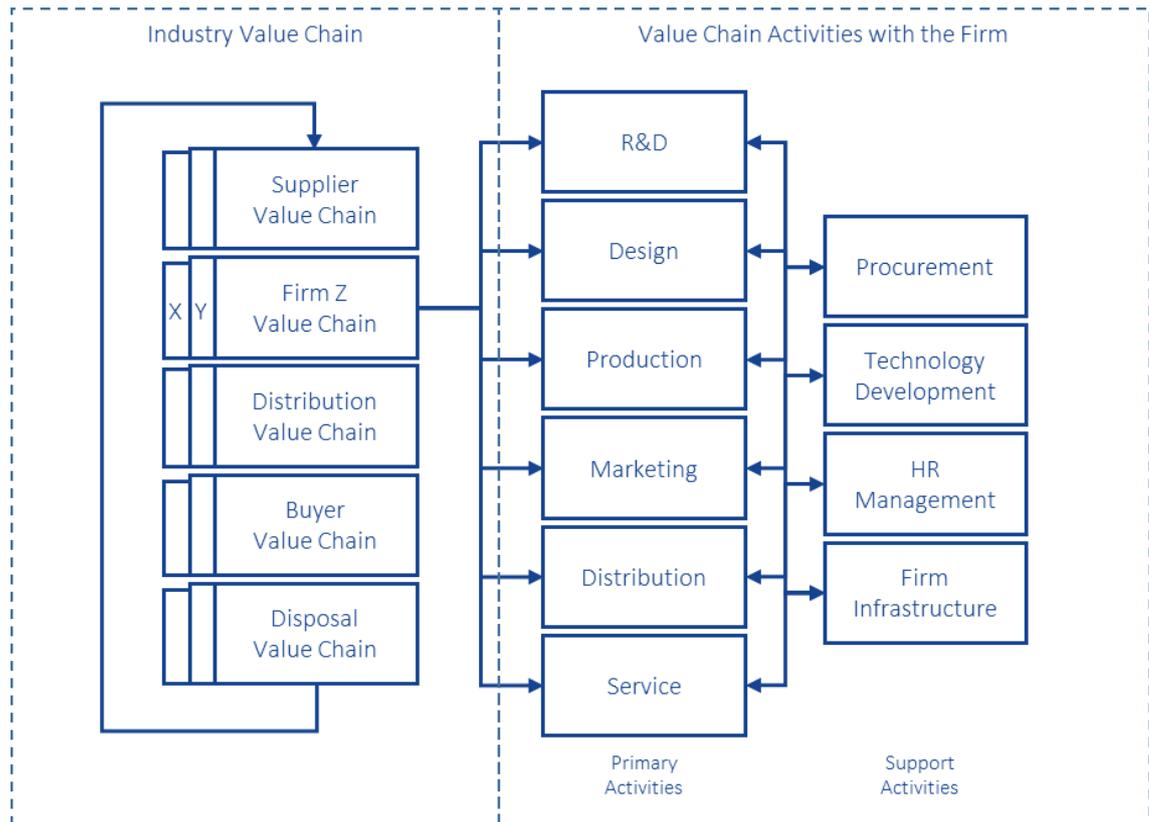
Based on these assumptions, the value chain was first introduced by Michael Porter in 1985. The purpose of the model was to show how the value accumulates during the sequence of different activities that will eventually lead to an end product or service, as seen in the Figure 14. The value chain analysis is assigned to help organizations to identify the internal chain of activities, processes and resources through which a firm designs, manufactures, markets, supplies and supports its product. The model also suggests the analysis of cost and differentiation through the value chain. (IMA [2] 1996, pp. 1-2; Ghemawat 2002, p. 61; Crain & Abraham 2008, p. 29; Kirli & Gümüş 2011, p. 309; CPP 2013, p. 1) The value creation influences the customer satisfaction and reflects the sources of the competitive advantage of the company. (CPP 2013, p. 1)



**Figure 14.** Linear value chain (IMA [2] 1996; M4P 2008; Springer-Heinze 2008)

The figure above illustrates a simplified value chain in which the value adding processes are put in an order in which they will be executed, starting often from the left. These steps can be called as core processes. (IMA [2] 1996, p. 12; M4P 2008, p. 30)

Porter's value chain model can be rearranged by taking characteristics of an industry into account as the phases of the model in its traditional form cannot be solely applied in every case, for example, in service industries. (CPP 2013, p. 2) Moreover, the concept of a value chain can be used for outlining a whole industrial value chain as well. (IMA [2] 1996, p. 2; Crain & Abraham 2008, p. 29) In an *industry value chain*, each phase represents an industry and thus a broader marketplace. (Crain & Abraham 2008, p. 29) Both the firm-specific value chain and industry value chain, as well as the linkage between them, are clarified in the Figure 15.



**Figure 15.** The industry value chain and the firm-specific value chain (adapted from IMA [2] 1996, p. 3)

The value chain analysis is mainly utilized for analyzing, coordinating and optimizing of the linkages between operations within value chain. The analysis focuses especially on the interdependencies between these associations by breaking the value chain into strategically appropriate segments. (Kirli & Gümüş 2011, p. 311)

*Value chain mapping* is a main tool for an initial analysis of the structure of a value chain, through which the fundamental elements in the value chain can be identified. A value chain map can be demonstrated either as a simple flow diagram, or in a more detailed form. A sophisticated version of a value chain map may emphasize, for example, the varying sizes of organizations and distinguishing between the significances of factors within the value chain. (Herr & Muzira 2009, pp. 64-65; UNIDO 2011, p. 15)

The objectives for the value chain mapping are to

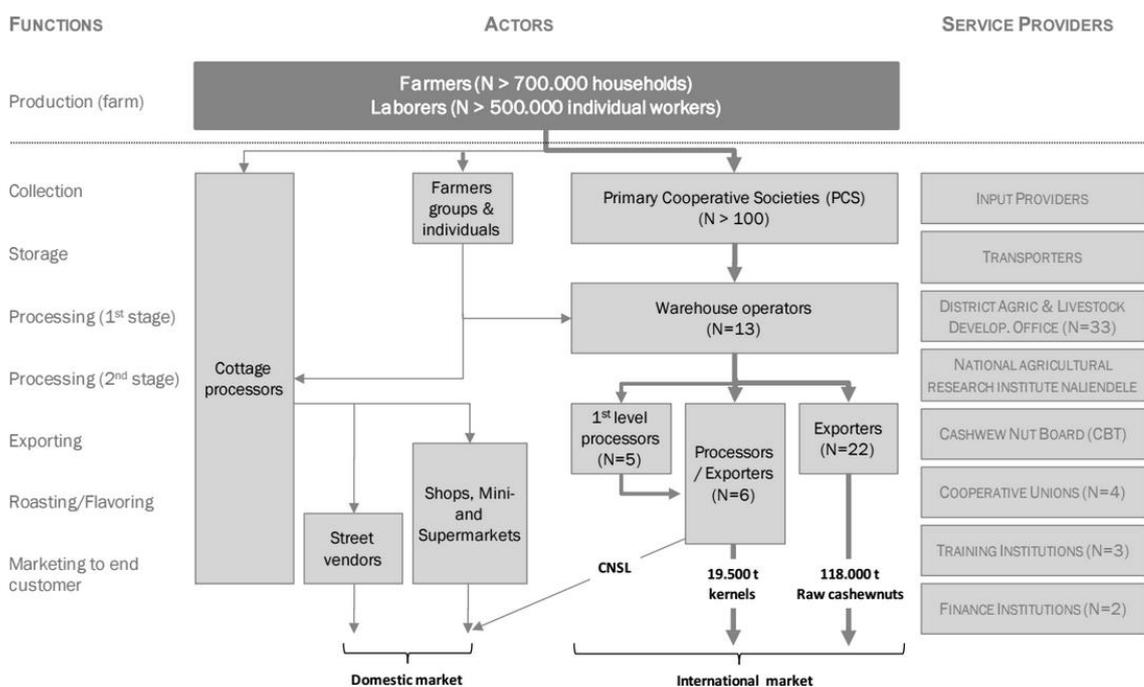
- Identify and categorize the essential actors in the market
- Visualize the network in order to demonstrate the interdependencies between the actors and processes throughout the value chain
- Set-up a background research for further analyzes by providing the practitioner with a general view and understanding of the value chain

Moreover, the value chain mapping may help to identify distribution channels, potential partners, the competitive situation of a sector, as well as the different options that are available for the firms within the industry. Some useful parameters to be taken into the analysis are actors, products, functions and flows, end-markets, business interactions and service provisions, for instance. (M4P 2008, p. 29; Springer-Heinze 2008, p. 55; Herr & Muzira 2009, p. 65; UNIDO 2011, pp. 15-16)

According to UNIDO (2011), the process of creating a value chain map consists of seven steps, which are

1. Information gathering through a desk research
2. Defining the functions that occur in the value chain
3. Identifying the types of actors and allocating them under the functions – some actors might cover more than just one function
4. Putting in arrows that illustrate the flow of goods or services going through the value chain
5. Identifying the generic groups of support services
6. Complementary data can also be added if available
7. Drawing the final map, writing an explanation of the conditions that appear in the value chain, and perhaps providing a list of parameters that are used

A value chain map describes all the actors, their roles and functions within the value chain, information of the number of the players, quantity of the products, and possibly distinguishes between domestic and international marketing channels. (UNIDO 2011, p. 17) An example of a value chain map is presented in the Figure 16.



**Figure 16.** An example of a value chain map within food industry (UNIDO 2011, p. 17)

Some papers emphasize that the process starts with the identification of the end product, the main phases in the value chain, as well the end customers. (Springer-Heinze 2008, p. 57; Herr & Muzira 2009, pp. 66-83) Then, the process continues with the identification of actors and supporting organizations (Springer-Heinze 2008, p. 57; Herr & Muzira 2009, pp. 66-83), and in addition, by recognizing the connections, flows and interactions between them (M4P 2008, pp. 33-34; Herr & Muzira 2009, pp. 66-83; UNIDO 2011, p. 17). Then, the value chain map will be completed with complementary data if available and considered relevant. (M4P 2008, p. 34; Herr & Muzira 2009, pp. 66-83; UNIDO 2011, p. 17)

#### **5.1.4 Theory on Scenario Analysis**

According to Fink et al. (2004), firms should not only have one visionary view that probably corresponds with their expectations. Instead, they should strive to create multiple views in order to create a big picture of possible opportunities. (Fink et al. 2004, p. 173)

A scenario is a contextual term referring to alternative projections and simulations that have a number of different use cases. (Fink et al. 2004, p. 174) According to Kosow and Gassner (2008), a scenario can be defined as a description of a situation that might take place in the future (known as conceptual future), including those paths that will eventually lead to the particular possible future situation. A scenario describes the dynamics and the development from which the future situation arises. (Kosow & Gassner 2008, p. 11) A scenario refers to a description of the potential nature of the future, and it is based on assumptions that seem to be critical for example in terms of an industry, economy, market, or technology. (Bensoussan & Fleisher 2013, p. 167) Therefore, scenarios are images of potential future situations shaped by numerous on-going developments in the business environment. Thus scenarios combine future-open thinking together with systems thinking. (Fink et al. 2004, p. 174)

A scenario analysis is an art of developing multiple different scenarios in an organized manner that might be helpful for building a mutual understanding and a baseline for strategic thinking, improving the flexibility in processes regarding long-term planning, as well as for providing a strategic early warning. (Bensoussan & Fleisher 2013, p. 167) The scenario creation is a way to assess the strategies of a company in order to cope with the uncertainties in a marketplace. (Fink et al. 2004, p. 173)

A scenario analysis can be valuable for firms that are seeking for future competitiveness or improved profitability through rethinking, reengineering or retooling. Especially when the level of uncertainty is high, a scenario analysis might be a highly supportive tool for decision-making and preparation for the future. (Bensoussan & Fleisher 2013, p. 167) The firms that hold the conditions as presented in the Table 4, are likely to benefit from scenario planning and analysis. (Bensoussan & Fleisher 2013, pp. 167-168)

**Table 4.** *Some of the reasons to use a scenario analysis technique (adapted from Bensoussan & Fleisher 2013)*

High uncertainty that is relative to predictability and adjustability to the future
Costly mistakes have occurred in the past
The firm finds hard to perceive or generate opportunities
The low quality of strategic thinking of the management
The industry has, or is going through a significant change
Need for a common language and framework for planning
Differences between executives' opinions and/or several options hold a merit
The competitors have utilized scenarios successfully

Scenario analysis is a combination of quantitative and qualitative analytical approaches that generates multiple realistic scenarios of the future business environment. It also includes narrowing down the scenarios into a manageable extent, adds an analysis to the process to determine variable relationships related to each other, brings up and isolates trends and patterns so that blind spots could be avoided in the process of strategic planning and finally, provides a framework for strategic decision-making processes. (Bensoussan & Fleisher 2013, pp. 168-169) There are four typical approaches to conduct a scenario analysis, shown in the Table 5.

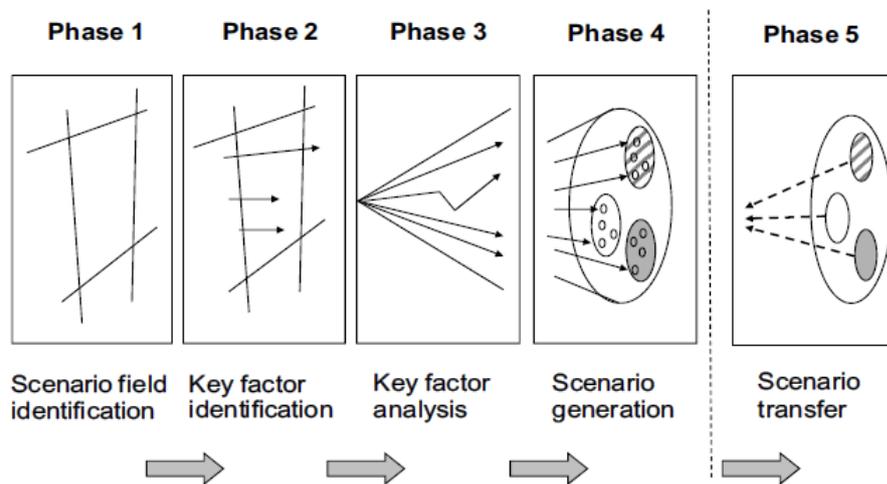
**Table 5.** *The general approaches for a scenario development (adapted from Bensoussan & Fleisher 2002, 2013)*

Quantitative method	Computer-Generated Econometric Model
Qualitative methods	Intuitive Method
	Delphi Method
	Cross-Impact Analysis

The quantitative method, Computer-Generated Econometric Model attempts to integrate a great amount of interrelationships between trends. The first qualitative method in the list, Intuitive Method, highlights those qualitative factors that are thought to shape the future. This is done by changing some of the observed trends in order to discover different future outcomes. Delphi Method refers to a panel of experts who are questioned separately and the questions often stress their particular field of expertise. Finally, the results are brought together and shared with involved parties. Cross-Impact Analysis also uses the opinions of experts, but adds their estimates of probabilities and timeframes about the future situations into analysis as well. (Bensoussan & Fleisher 2013, pp. 169-170)

The output of a scenario will be an imaginable configuration of the industry, and a set of different scenarios would involve a broad view to diverse, yet potential futures. (Bensoussan & Fleisher 2013, pp. 168-169) Lemos and Porto (1998) state that scenarios are used as a combination of procedures by exploiting intuitive, cognitive and mechanistic approaches that will help to foresee the future. (Lemos & Porto 1998, p. 332) Scenarios may help to determine the essential sources of competitive advantages and critical success factors. Furthermore, each scenario can be used to predict competitive actions. Scenario analysis itself strives for internal consistency and hence, it drives the analysts to combine causal paths and interrelated sequences that may shape the scenarios taking place in the future. (Bensoussan & Fleisher 2013, p. 172)

Scenario analysis starts by highlighting the decision to be made, as well as by challenging the current mental models that shape perceptions. Further, the process includes information gathering from various sources. The geographic scope of the analysis varies from global to local, and from international to national levels. (Bensoussan & Fleisher 2013, p. 173). The process follows a systematic and distinct phases. (Bood & Postma 1998; Fink et al. 2004; Kosow & Gassner 2008; Bensoussan & Fleisher 2013). Even though the principles are mainly the same across the examined literature, the process can be described, for instance, in either four (e.g. Fink et al. 2004), five (e.g. Kosow & Gassner 2008) or even in six (e.g. Bood & Postma 1998) phases. A five-phased model is illustrated in the Figure 17.



**Figure 17.** Five steps of scenario development (adapted from Kosow & Gassner 2008)

These five consecutive phases are, according to Kosow and Gassner (2008), and from the identification of key factors and onwards, supported by Bensoussan and Fleisher (2013) and Fink et al. (2004) as well,

- The identification of the scenario field: Defining purpose and reasoning why scenarios are being developed, and what is the specific issue to be solved, along with what are the limits and restrictions for scenarios. (Kosow & Gassner 2008, p. 26)

- The identification of key factors: Every scenario holds a variety of influential factors, often appearing in vast amounts. These are the factors that make up a description of the scenario. The factors should be clustered in a proper manner and the clusters should have a descriptive name. Too many factors will make the analysis too complex, and therefore only the key factors should be selected. These are the factors that can be considered characteristic for the development of the scenario field, or have a great influence on it. (Fink et al. 2004, pp. 174-175; Kosow & Gassner 2008, pp. 26-27)
- Analysis of key factors and alternative future projections: This is the major part of the scenario analysis, which begins by determining the time horizon within which the scenarios will take place. After this the projections for the future can be developed. During the phase the key factors are subjected into analysis to find which factors might fit each case. Besides developing the most likely scenarios, also alternative possible scenarios should be taken into account in order to complete the whole view. (Fink et al. 2004, p. 175; Kosow & Gassner 2008, p. 27)
- Scenario generation: In this phase, consistent bundles of elements will be selected, evaluated and developed into scenarios. Each of the possible scenarios should represent possible future states and a view of possibilities. The consistency of these futuristic pictures should be assessed and combined together. The combinations will generate projection bundles, and the notably common projections within these bundles are called as scenario elements. (Fink et al. 2004, p. 175; Kosow & Gassner 2008, pp. 27-28)
- Scenario transfer: The final phase stands for further application and processing of scenarios. The finished scenarios can be analyzed in detail, and the questions may concern the specific characteristics and variables as well as the consequences of the scenarios. Moreover, the scenarios can be used as inputs for further analyses, e.g. in strategy assessment and development, impact analyses and so forth. (Fink et al. 2004, p. 175; Kosow & Gassner 2008, p. 30)

Bensoussan and Fleisher (2013) suggest the following, more detailed approach for scenario development. The process starts with the scoping of the analysis, and continues to the identification of the major stakeholders, trends and uncertainties, and to the phase of construction of initial scenario themes. Then, consistency and credibility are checked, the learning scenarios are developed, and information needs are being identified. Finally, quantitative models will be modelled and applied into decision-making. (Bensoussan & Fleisher 2013, p. 173)

The resemblances between approaches suggested by Kosow and Gassner (2008), Fink et al. (2004), and Bensoussan and Fleisher (2013) seem to be apparent despite the varying sophistication on the scenario descriptions. However, Kosow and Gassner (2008), as well

as Bensoussan and Fleisher (2013) state that there is no particular correct way to execute a scenario analysis. (Kosow and Gassner 2008, p. 9; Bensoussan & Fleisher 2013, p. 174) Kosow and Gassner (2008) argue that the comprehensive and detailed toolkits for implementing a scenario analysis are universally absent. (Kosow and Gassner 2008, p. 9) Thus it can be interpreted that the conduct of scenarios is highly contextual and dependent on the practitioner.

## **5.2 Information Sources and Gathering**

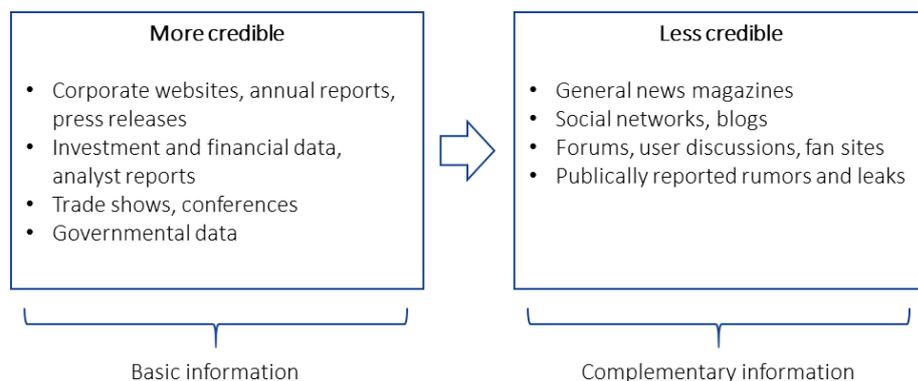
It is an intention to use only free sources and publically available information. The main information source will be the Internet since a vast amount of information can be gathered through an online search. In order to enable a high quality of intelligence, the quality attributes have to be taken into account. Some of the major attributes involve relevance, comprehensiveness, accuracy, consistency and timeliness. Moreover, the credibility of the information sources is an issue to be coped with. The trustworthiness of each of the source has to be ensured. Supposedly, some of the credible sources are include, for example corporate websites and company profiles, scientific journals, well-known economic and technological journals, and acknowledged databases, such as governmental patent libraries. However, using only the seemingly credible sources might not be adequate to fill the gap of information needed to conduct the analysis. Therefore, the use of social networks, blogs, forums and subject specific websites are being used as well as strategically significant information might be derived from unexpected sources as well. Obviously, the information acquired from less credible sources has to be evaluated carefully before the use of it.

The planned information sources are presented in the Table 6. Notable is, that the discussions between professionals are practiced through review meetings to gain more versatile insights, and to ensure the direction of the intelligence process to be towards the desired objectives the CI process was launched for.

**Table 6.** *Initial sources for information gathering*

Source Type
Intellectual capital, professionals, colleagues
Corporate websites, annual reports, press releases
Investment and financial data, analyst reports
Trade shows, conferences
Governmental and open data, patent databases
Social networks, blogs
News, articles
Technological, economic news
VR focused websites
Forums, user discussions, fan sites

The table shows the sources consist mostly of secondary information sources. Whereas primary information sources are seen to include professional interviews and questionnaires, the secondary sources include mostly online websites and archives, for example corporate websites, journals, news, social media and blogs and databases. This focus is justified as strategically important information is the one the firm does not already have, or know. A broad variety of sources have to be considered in order to acquire fresh information to a significant extent. Important is to understand that even the most credible sources cannot be relied on for long, due to the extreme dynamics in the market. However, a rough split between the levels of credibility of the sources can be done as demonstrated in the Figure 18.

**Figure 18.** *The categorization of information sources by their credibility*

As illustrated, the first place to investigate the information are the websites of companies and relevant stakeholders. This approach enables an access to the basic information, for example to their business, products, key people, organizational structure and possibly

even business models, with a relative ease. Also the financial statements, annual reports and timely news can be acquired from these sources. Then, the search will continue to journals and magazines, as well as to analyst reports and market insights to complement the big picture. Also, information might be gathered from more specific sources, such as from patent databases. The base of basic information will be complemented by additional sources, such as social networking services.

### **5.3 Analyzing the Information**

During the chapter the gathered information will be analyzed to gain insights and to develop intelligence regarding the marketplace. As introduced earlier, the chosen tools are value chain mapping and scenario analysis. Hence, the analysis follows a top-down approach: The analysis begins with a high level analysis from the value chain perspective, and continues to the scenario analysis that will focus on details that might influence the future state of the market. Thus the value chain map is used as an input for the scenario analysis as it delivers a general view of the market in terms of the most significant players.

The value chain mapping technique is conducted in the chapter 5.4. The analysis will result in a map of current players and certain dependencies in the marketplace. The analysis therefore illustrates the competitive situation and can be used as an input for scenario analysis. The findings on the actors in every phase of the value chain are represented in various tables.

The scenario analysis is executed in the chapter 5.5. The analysis concludes with some likely or otherwise interesting future scenarios. The knowledge gained from the value chain mapping process, to be supplemented with additional information, will be used for the scenario creation and analysis. The major benefit of the analysis is the extra information derivable from the analysis, and the insights the findings bring along. The scenario analysis concludes with the help of Porter's five forces in order to analyze the industrial impacts of each scenario.

### **5.4 Value Chain Mapping**

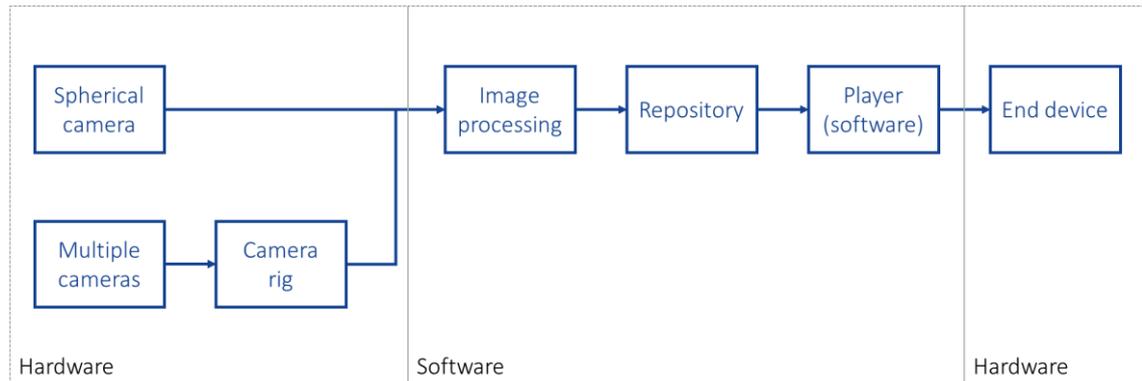
Value chain mapping is used as part of the analysis in order to gain a big view of the competitive landscape by involving the relevant actors and the interdependencies between them in the value chain. Thus the technique necessitates the identification of the players within the industry, choosing the most interesting ones, and finally to putting them into the map by using the available information.

The following questions serve the objectives of the CI initiative, and are to be answered through the value chain mapping analysis:

- What are the most notable actors in the value chain?

- Which of these players should be taken into closer consideration?
- What does the value chain look like in every case of the chosen organizations, and do these value chains have linkages between each other?
- Do any competitive advantages occur when comparing the observed firms, for instance in terms of business model, profiting, or value creation?

The industry value chain can be recognized at a top level as follows (Figure 19). This high-level separation acts as the scope for the value chain, and the CI initiative as a whole.



**Figure 19.** A top level observation of a value chain

The figure above illustrates how the value accumulates within the scope. First, the content is captured with some sort of a VR camera device and then, the content is processed either with a software integrated in the device, or with a separate image processing software. Further, the content is stored in a repository, for example as to cloud storage, and finally the content is consumed with the use of a player software or an end device.

The information gathering begins with the first phase of the value chain. The following Table 7 contains *VR camera providers* that already have, or are about to bring their product to the market. Noteworthy, the list includes only the products that seem to be viable. Even though there are a number of recently initiated VR start-ups, depending on their current state of the product development process and their financial background (e.g. Kickstarter firms), some of them did not seem to be relevant to be included in the list at the time.

**Table 7.** *The findings on the 360 camera providers*

<b>Company</b>	<b>Product</b>	<b>Segment</b>
360Fly, Inc.	360Fly	Consumer
VSN Mobil*	V.360	Consumer
Bubl Tech	Bublcam	Consumer
Giroptic	360Cam	Consumer
Kodak	PixPro SP360	Consumer
Ricoh Company	Ricoh Theta	Consumer
Sphericam	Sphericam	Consumer
GoPRO, Inc.	GoPro Spherical	Consumer/Prosumer
IC Real Tech	Allie Cameras	Consumer/Prosumer
Google	JUMP	Prosumer
Immersive Media	Hex, Quattro and Dodeca2360	Professional
Jaunt, Inc.	NEO	Professional
Lytro	Immerge	Professional
NCTech Ltd.	iStar Pulsar	Professional
NextVR, Inc.	Red Dragon rig	Professional
Point Grey Research	LadyBugs (2, 3 and 5)	Professional
Samsung	Project Beyond	Professional

\* Acquired by 360Fly Inc. in 2015

As seen from the table, the players are categorized into three different main segments: consumers, prosumers and professionals. The split is done in accordance with their offering, by using certain parameters, for example price levels, as well as the desired target segments and end uses. A research through companies' websites reveals that the consumer devices cost approximately from \$300 to \$1500. The prosumer devices come at a higher price tag – for instance, the price of GoPro's spherical rig is expected raise beyond \$3000 which is, besides the unannounced price of the rig itself, due to the needed six pieces of HERO4 cameras, ca. \$500 each (VentureBeat [1] 2015) According to Mashable, GoPro Odyssey, a JUMP implementation, will cost \$15,000. (Mashable [2] 2015) Professional segment seems to be a distinct market. This not only due to the high price level, but also due to differentiating focus on, for instance cinematic production, sports events and TV shows.

For the value chain map, six players will be selected. First ones to take into consideration are Immersive Media, Jaunt, NextVR and Samsung as they all are operating in the professional segment – just like the target company. Thus they can reasonably be considered as potential rivals. Further, Google and GoPro will be taken into account as well, partly due to their collaborative actions, but also due to potential they might have in their own fields. GoPro, for instance, might have interests towards consumer devices whereas

Google might want to use its great resources to build up something that serves its main business, or possibly enables new ones to form.

The following list identifies the *software products* – already limited to the acts selected previously – used to process, store and deliver the content.

**Table 8.** *The software utilized to process, store and deliver the content*

	Associated acts	Processing and stitching	File Management/Storage	Delivery and playing
Internal	Google	Assembler (JUMP)	YouTube360	YouTube360
	GoPro	Kolor Stitching	Kolor Host	Kolor Player
	Immersive Media	imLive Encoder	imLive Server	imPlayback
	Jaunt	Own technology		Jaunt desktop player
	NextVR	Own technology	NextVR Portal	NextVR Portal
	Samsung	Own technology	MilkVR	
3rd party	Support: Oculus, Microsoft (Xbox)			Max VR
	Support: Oculus, Microsoft (Xbox)			Whirligig
		VideoStitch		
				VR Player
				LiveViewRift

Besides having a hardware, the list shows the extent to which the actors have software solutions to process and distribute the captured content to the users and customers. For instance, Google's JUMP platform accommodates a software that enables to process raw video content (Assembler). The content is intended to be submitted to an online repository (YouTube360) which takes care of the storing, and acts as a playing platform. GoPro instead, acquired a VR software company (Kolor) for the purpose. There are also some 3<sup>rd</sup> party software products available, mentioned in the table. However, the list points out that these firms have their own technology to process and deliver the content captured. These software products are usually included when purchasing a VR camera, and therefore there is no need to use third party software products.

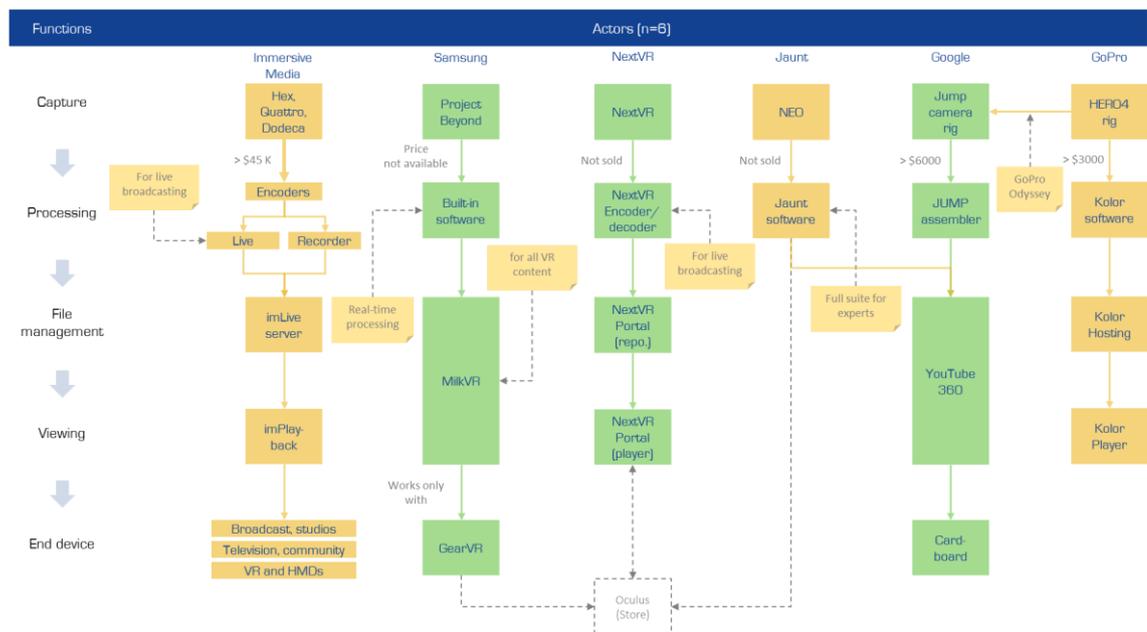
The market of *head-mounted displays* (HMDs) is represented in the Table 9.

**Table 9.** *The findings on HMD providers*

HMD products			
Altergaze	FreeflyVR	Microsoft's HoloLens	StarVR
ANTVR Kit	Google Cardboard	Moggles	TrinityVR
Apple	Homido	NoonVR	Viewbox
Archos	HTC Vive	Oculus Rift CV1	Visus VR
Avegant Glyph	Immerse VR headset	Oculus Rift DK1&2	Vrizzmo
Canon	ImmersiON-Vrelia	Pinc	VRTX Dive
Carl Zeiss VR One	Leap Motion	Razer's OSVR	VRVANA Totem
Durovis Dive	Lights & Shadows Neo	Samsung Gear VR	XGVR
Favolcano	Magic Leap	SCE's Project Morpheus	
FOVE	Merge	Sixense	

The findings in the table represent both the currently available, and up-coming headsets in the market. The discoveries, however, do not limit only to traditional VR goggles – there was also findings on technologies regarding augmented reality and mixed-reality. These efforts might integrate into the industry either by providing complimentary or competing products and services. For example, Microsoft and Magic Leap are both companies that develop augmented reality technologies. The table shows that there are currently more companies providing HMDs than companies developing VR cameras. To be noted, the table excludes many of HMDs as there is a remarkable number of low-priced HMDs in the market. For instance, Amazon.com finds numerous affordable HMDs that are practically similar to Google Cardboard.

The next step is to build up the value chain map. The map is shown in the Figure 20 and the big version of it can be found as Appendix A.



**Figure 20.** The value chain map of the observed actors

First, the chosen actors are barely interrelated and all of these companies have their own business logic. Moreover, there is less rivalry among the actors than assumed, for varying reasons.

A thing to notice is that only a few of the VR cameras are commercially available. From these products, Google and GoPro are providing the most affordable products whereas Immersive Media is selling its professional cameras for higher prices. Samsung's Project Beyond is still under development. Thus there is no information available about the target clients, price levels or even intended specific use cases. NextVR and Jaunt are not targeting to generate sales through device sales at all. Jaunt is initially offering its camera for filmmakers (Wired 2015) and thus their NEO camera is only available for partners. NextVR instead, strives to turn its technology into money by live streaming VR content

from live shows and sport events, for instance. In general, Immersive Media, Samsung, NextVR, and most likely also Jaunt, will all have some sort of efforts on live stream capabilities.

“If the camera can stream content, the stitching and depth are presumably processed in real time.” (Road to VR [1] 2014)

All of the studied companies have either developed, or acquired their abilities to encode and process the content. The software solutions are either built in the camera device or run by a separate device, thus enabling the convenience and the ability for real-time image processing. Moreover, these companies are collaborating with broadcasters, studios and film makers. Foremost, Jaunt does stand out with its strong focus on cinematic VR experiences. Whereas Immersive Media and NextVR are providing live stream technology for live events, Jaunt is distinctively emerging into the cinematic industry. For example, in September of 2015, Jaunt announced that Walt Disney is leading an investment in the firms which totals up to \$65 million (Jaunt 2015 [2]).

“Jaunt has no plans to sell the Neo to consumers. Instead, it built it primarily to help its own production efforts.” (Variety 2015)

“The company [NextVR] isn’t selling the camera system – they’re using it to produce recorded and live content.” (Road to VR [2] 2014)

Only Samsung and Google have currently an end-to-end ecosystem in the sense that both of them have some sort of a solution of their own in every phase of the value chain. However, excluding Samsung, the players in the value chain map do not indicate any significant interest in the HMD markets: Google's Cardboard is rather an affordable and easy way for trying out VR experiences than a remarkable source to gain profits. However, created to work with Android devices and YouTube360 in the first place (yet not only with them anymore), Cardboard does drive the consumer adoption of Google's products and services in a way.

Noteworthy, these companies have a solid cloud platform for uploading, storing and sharing VR content. The difference is, however, that Samsung’s Milk VR is designed only for the firm’s Gear VR headset whereas Google’s YouTube360 works basically with all kinds of HMDs. Further, YouTube360 is compatible with computer browser, as well as with mobile devices ran with the most popular operating systems (Android and iOS). Both of these platforms accept all kinds of VR videos as long as they are formatted in a preferred manner. Immersive Media is an exception as it has its own cloud platform to enable the various ways to deliver the content. Thus it is not a public repository as Samsung’s and Google’s corresponding ones.

Business models do vary. Both Immersive Media and NextVR have an end-to-end solution, including cameras and encoders, platforms for distribution, as well as playbacks.

The difference is, though, that Immersive Media offers the products directly, whereas NextVR only uses its technology to profit by live streaming live events. Jaunt's business concept is to focus on cinematic content and to offer the capabilities (cameras and studios venues) for professional customers. Samsung instead, has its Milk VR platform. The content is free, but it requires company's smartphone and headset. The service concentrates especially on the user generated content and community VR film-making. (Road to VR [3] 2015) Google, however, enables an open platform as the JUMP platform is intended to be opened for most of the digital camera providers. The first partnership was launched with GoPro, and the implementation accommodates sixteen GoPro HERO4 cameras. GoPro has also developed its own spherical camera rig and software to stitch the content with.

To conclude with, all the observed actors have more or less different business models and revenue logics. From Nokia Technologies' perspective, the attention should be on Immersive Media, NextVR and Jaunt. These firms have similar intentions as Nokia, yet none of them has as comprehensive approach. Attention on Samsung, Google and GoPro is essential in order to understand the development of the industry, as well as the trends and characteristics in the consumer segment better. As Samsung is still prototyping its camera device, the major business is still around the company's HMD (Gear VR), powered by company's smart phones and the online repository for the immersive content (Milk VR). Google might take over the VR adverts in a way or another – for example, the firm has invested in Jaunt and has announced the firm to be the preferred content creator. (Jaunt 2015 [1]) GoPro is clearly just beginning in the VR market, but the eyes should be kept on the actions of the firm along the other players in the consumer segment.

## **5.5 Scenario Analysis**

It is necessary to interpret and analyze the direction the industry is heading to. When the current state of the industry is understood, a proactive step can be taken, and the further analysis may focus on the potential and interesting events that could take place in the future. The scenario creation directs the attention to the factors that will, if realizing, create a significant change compared to the market as of today. Especially the technology industry, including the markets of VR technologies, are often shaped by powerful industrial dynamics due to rapid product development and other constant changes in the competitive environment. Thus the scenario creation have the potential to provide decision-makers with valuable knowledge regarding opportunities and threats in the observed marketplace.

The reasons to execute a scenario analysis can be derived from the theory (see Chapter 5.1.4, Table 4), including two major aspects. The first aspect is the 'high uncertainty', referring to the fact the current marketplace is still emerging and most of the products are still under development. At the time, industry seems to be uncertain and unpredictable. The second aspect is the 'constant industrial change'. Related to high uncertainty, the development of the market keep the industry dynamic for an undefined period of time

before getting stabilized. Therefore, the objectives for the analysis, in accordance with the objectives of the CI initiative, can be stated as follows:

- The creation of relevant events that might take place in the short-term future
- The identification of the main reasons and the path of development that could lead to the generated scenarios
- The analysis of the impact on the VR industry if these scenarios take place

The scope of the scenarios is as follows (Table 10):

*Table 10. The scope of the scenario analysis*

Timeframe	One to two years (1-2 years)
Scope	Products: VR applications and devices Market: VR market Customers: Everybody Technology: Immersive/VR technologies Geography: Global

The timeframe shown in the table is relatively short due to the fast-paced industrial change. Presumably, significant changes in the marketplace will already take place in a year or two. Further, the scoping is done for products, market, customers, technology and geography in order to have a predefined frames and limitations prior to the scenario creation.

The key factors can be stated as follows:

- The market is rapidly evolving and thus highly uncertain
- The amount of commercially available products is small at the time
- VR market is foremost led by the application domains regarding gaming, social experiences and mobility
- The industry has, and will attract a number of new competitive actors

These statements include the very basic and most obvious assumptions that direct the scenario creation.

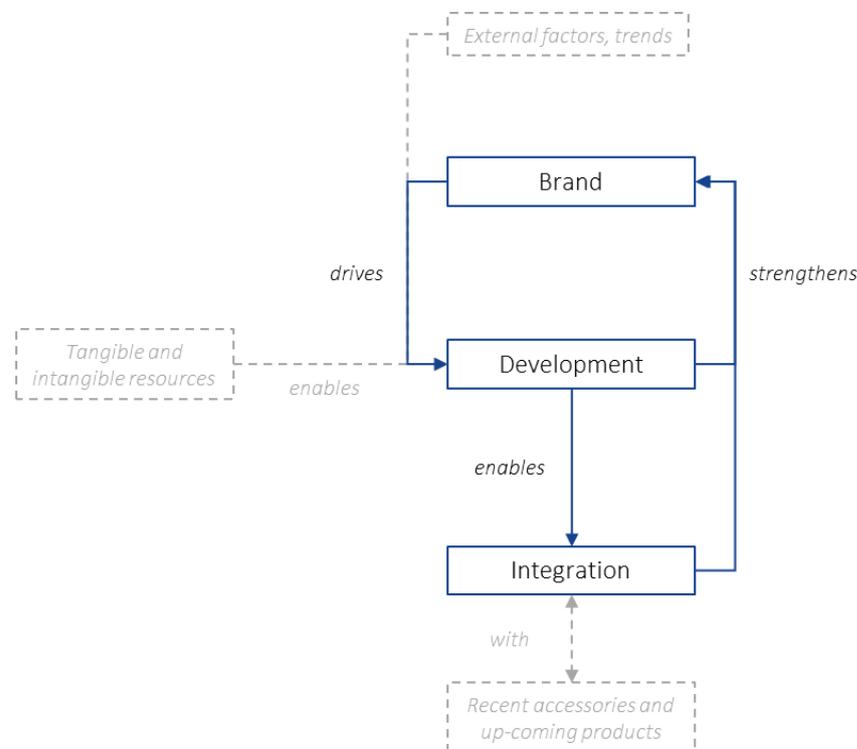
### **5.5.1 Scenario: GoPro announces its own VR camera**

In this scenario, GoPro announces and focuses on its own VR camera. The assumption is easy to make as the company's offering is known for camera solutions capable of capturing content in extreme conditions. With the use of the company's complementary accessories, the cameras are attachable in a variety of situations, enabling the users to capture content in various situations. GoPro is a sovereign leader of the action camera market,

and currently reaching a strong position in the market of digital cameras as a whole. (Market Realist 2015)

Despite the current efforts in the field of VR, strategically the most sense-making option for the firm would be to develop an actual VR camera instead of a camera rig. A VR camera would be way more attractive option for consumers as they do not have to buy cameras and rigs separately – moreover, this option would allow lower cost of the product in the long-term.

The main motivation for GoPro to start the development of its own VR camera would probably come from the curiosity towards the potential of the VR market, and to what extent the significant brand power of the company could help to catch market share in the field. A market entry could be reasoned in various way, and it could follow the logic as illustrated in the Figure 21, for instance.



**Figure 21.** GoPro's own product would be logical step to take

The figure above shows that the intangible resources, for instance the sound knowledge of camera technologies, as well as the knowledge regarding VR technologies derived from the acquisition of Kolor, would enable the development of new competitive VR products with a relative ease. Thus the new product could be integrated into existing product family and complementary products.

GoPro's VR efforts might also have something to do with their recently announced drone project. (Forbes [2] 2015)

GoPro is not the only one around to develop drones – for instance, Google has been working on its Project Wing (Engadget 2014), and there are some drones in the market already from DJI, 3D Robotics, and Parrot – there is clearly something happening in that field. The new product from GoPro could be, for example, be integrated to this drone as well.

*“They [Parrot, a drone company] are building it with a simple integration to virtual reality headsets like the Oculus Rift, opening up an amazing new way to experience flight.” (The Verge 2014)*

Finally, GoPro might want to take its slice of the up-coming drone industry, and even better, the firm could integrate VR technologies into the drones in the first place.

### **5.5.2 Scenario: GoPro dominates the consumer market**

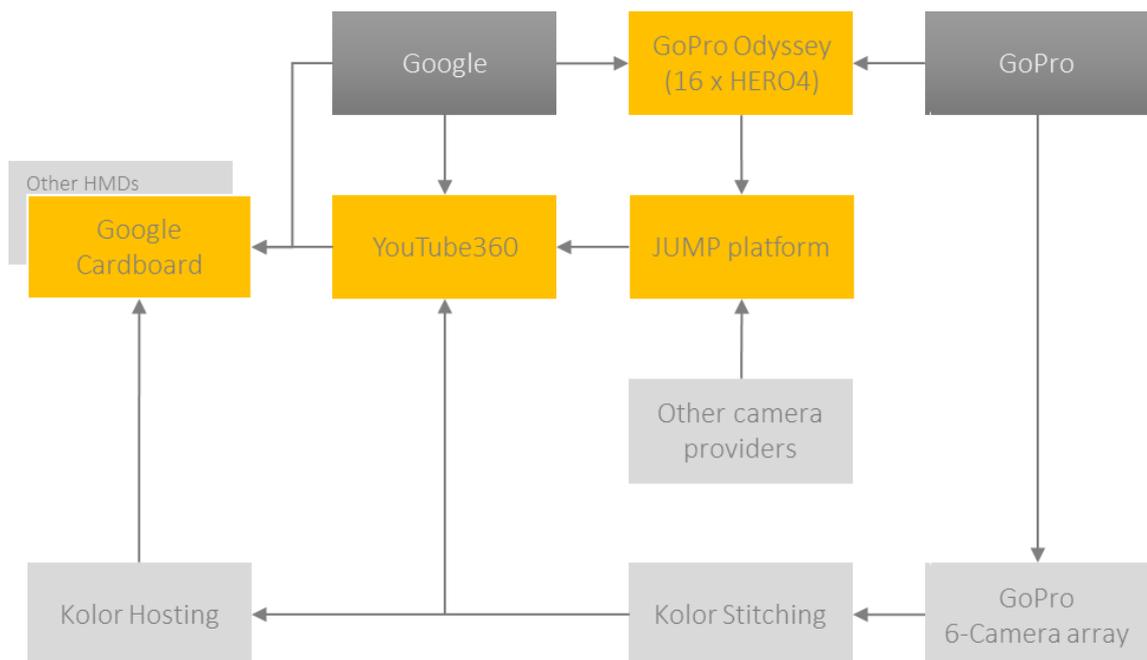
In this scenario, GoPro will take over the consumer segment regarding VR cameras. It seems rather logical for GoPro to expand into VR market. Besides that VR market are expected to grow strongly in general, GoPro already has a remarkable base of users. The customers of GoPro use the company’s solutions to capture immersive footage, for example to record extreme sports, and thus the brand would support the expansion into more immersive camera technologies. Despite the digital cameras are giving increasingly more space for smartphones (a fall from 122 million units sold in 2010 to 42 million units sold in 2014), the action cameras are on the rise. The shipments of action cameras are estimated to increase from estimated 4.2 million units in 2015 to the estimation of 5.15 million units in 2016. As GoPro is already leading the trend – as of August 2015 the market share of action cameras being around 48 percent – GoPro is likely to take an advantage of the rising VR trend as well. (Market Realist 2015)

Yet the path of development to the assumed scenario is unclear. Currently, GoPro collaborates with Google’s, but has its own VR camera rig as well (Figure 22). The collaboration with Google refers to a certain adoption of Google’s VR platform, namely, JUMP. The GoPro-specific adoption, called as GoPro Odyssey, accommodates 16 GoPro HERO4 cameras in an array. Google JUMP itself, however, will be an open platform in the long-term with an intension to work with other camera models as well.



**Figure 22.** GoPro's publically announced VR efforts

GoPro's own solution is a spherical rig accommodating 6 GoPro HERO4 cameras. The captured content will be processed, and alternatively also shared through the software provided by Kolor, a VR company that GoPro recently acquired. (GoPro 2015) The price of the rig will be estimated to over \$3000 dollars. (VentureBeat [1] 2015) The Figure 23 illustrates GoPro's current efforts in the VR market, as well as the interrelations between Google.



**Figure 23.** Interrelations between GoPro and Google

The probability that GoPro will gain significant market share only with its current affairs is possible, yet not likely. GoPro and other companies targeting to the consumer segment will create a highly competitive environment where the convenience, quality and affordability of the product will probably be some of the key factors determining the competitiveness of a firm. If the taken place, the scenario might have a strong impact on industry.

The prerequisite is, however, to win the initial competition that is already starting to shape.

### 5.5.3 Scenario: Market shares in the consumer segment will be strongly distributed

This scenario represents a situation in which GoPro faces strong competitive actions, and the market share in the consumer segment becomes highly distributed – roughly comparable to the beginning of the market of smartphones. The scenario makes sense as there is already plenty of forerunning products in the marketplace, most notably Ricoh Theta, Kodak Pixpro SP360 and VSN Mobil's V.360. The current competitive landscape is shown in the Table 11. The list consists of the potential competitors from GoPro's perspective, meaning that only the companies developing consumer VR cameras are taken into account. Further, too recent start-up companies, or otherwise irrelevant (e.g. infeasible projects in terms of the product or financial situation, or for other reasons) projects are not considered relevant competitors at the time.

*Table 11. Competitive landscape between of consumer VR camera providers (as of November 14<sup>th</sup> 2015)*

Product	Company	Segment	Availability
360cam	Giroptic	Consumer	Available for pre-order
360fly	360fly, Inc.	Consumer	Yes
Bublcam	Bubl Technology	Consumer	Yes
Pixpro SP360	Kodak	Consumer	Yes
Ricoh Theta	Ricoh Company	Consumer	Yes
Sphericam2	Sphericam	Consumer	Available for pre-order
V.360	VSN Mobil	Consumer	Yes

As can be seen, some of the devices are still upcoming. The competition is ever increasing, and the importance of differentiation will be valuable. The first mover advantage is also essential: A firm called Bubl announced on its website that product shipment are not guaranteed in 2015 due to the unexpected high demand (14<sup>th</sup> November 2015).

As mentioned before, the major benefit of GoPro is its distinct use cases in extreme conditions. Yet, it is necessary to identify the actual threats (Figure 24). 360fly is among the

most notable rivals – even Mashable stated that 360fly “could do for VR what GoPro did for action cameras”. (Mashable [1] 2015)

*“GoPro's done a good job -- they own the [action camera] space. No one owns the 360-degree video space.” – 360Fly's CEO (Mashable [1] 2015)*

It is certain that the company has significant efforts to get a grip of still non-existing action VR camera markets. However, 360Fly lacks of a certain technical ability, which is the fact the camera's field of view is not fully spherical (360x240 degrees). The same situation is with another potential competitor, 360cam. Despite the compact size, the device does not provide a fully spherical content (360x300). An ability to record a full sphere is the factor that differentiates an immersive VR environment from a panoramic video. Though, both of these cameras are reasonably priced (\$399 for 360fly, and \$499 for 360cam). 360fly is already available, whereas 360cam is in the pre-order phase. (Slant 2015)



**Figure 24.** GoPro has some potential competitors, starting from left: 360cam, Sphericam, 360fly and Bublcam

The most potential competitors are Bublcam and Sphericam2. Both of these provide a full sphere (360x360), seem to be technically promising, and have a relatively extensive media coverage.

*“Bubl puts a great deal of focus on the Bublcam's potential use for extreme sports like skydiving – an area currently dominated by GoPro cameras.” (Gigaom 2013)*

However, the price level is higher compared to previously mentioned rivals. Bublcam has an initial price of \$800 whereas Sphericam2 is ca. \$1700. Besides being notably cheaper, Bublcam is already pre-orderable whereas Sphericam2 is still under development.

*“The Sphericam could fulfil a very similar function to the GoPro, but for VR.” (Factor-Tech 2015)*

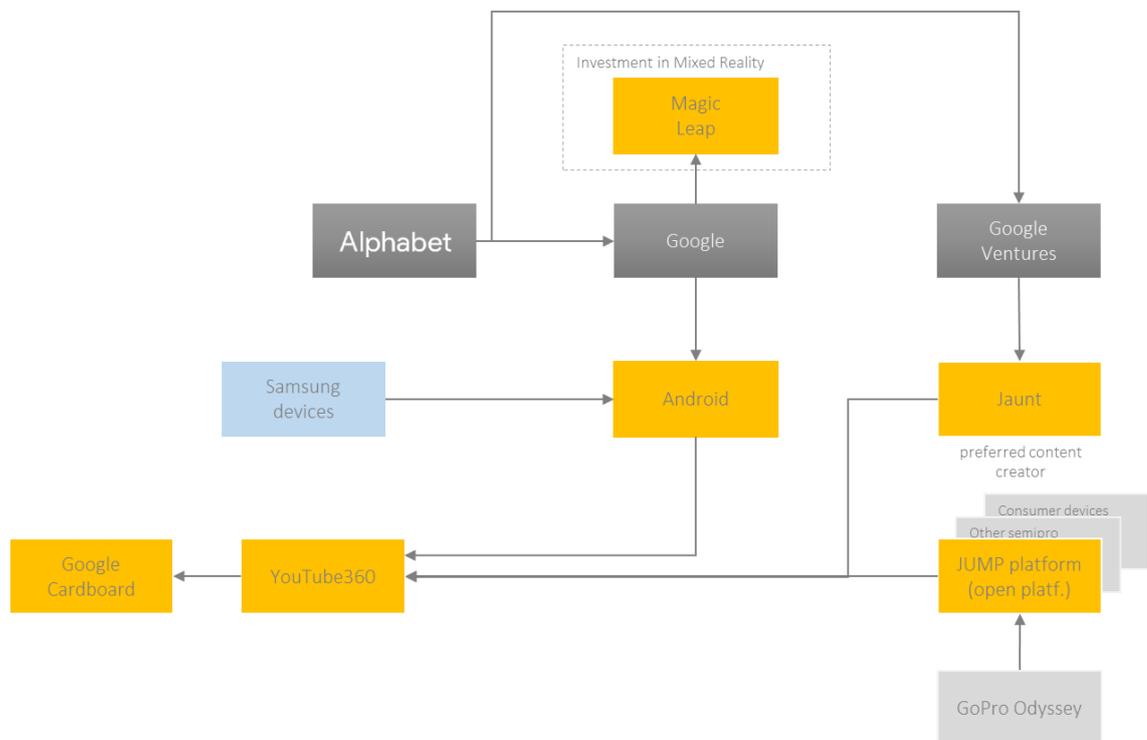
Noteworthy is, that if the VR technology will expand into daily use, the rivals might not only be threats in the field of VR – but they might also challenge the whole market of action cameras. The likeliness of the scenario is high, and the impact would be influential.

A significant advantage for GoPro or any other player would be the reduction of the competition by strategic acquisitions before the rivalry even starts to shape. Despite the elimination of competition the other benefits of acquisitions would stay minimal. The offerings are highly varying in terms of technical details, physical appearance, functions, software, and additional services that come with the product purchase.

#### 5.5.4 Scenario: Google profits throughout the industry

In this scenario Google successfully expands its resources and capabilities into VR industry as a whole. To start with, the JUMP rig with GoPro's HERO4 cameras is the first camera specific implementation enabling initial content creation directly for Google's ecosystem. In the long-term, JUMP will open for other camera models as well, possibly raising more interest among the customers. The profits generated through JUMP as its current form, though, stay a bit unclear.

YouTube might play a great part in the game, as the platform has a huge opportunity to become the major VR video repository. This is imaginable as the service is basically the de facto standard in video sharing on Internet. The service also enables the content from most of the consumer VR cameras as well, as long as certain technical requirements are being followed. Google's advert based revenue model will benefit from the accelerating creation of immersive videos, and the firm is likely to generate new ways of profiting through VR technology (e.g. VR advertising). The full view to Google's current VR efforts is represented in the Figure 25.



**Figure 25.** Google is already involved in the VR industry at various levels

Not forgetting, Google has announced its VR goggles in the form of Google Cardboard. Due to the cheap price, the headset is an easy enabler for consumers to try out VR content. The VR content can either be accessed on YouTube, or by purchasing them on Google Play. Both from Google's and consumer's perspective, the biggest benefits will be acquired if a user has a Google Android driven smartphone.

Finally, it is clear that Google has already comprehensive activities throughout the VR industry as seen in the figure. Google has already investments in the field of augmented reality and cinematic VR as well, widening the comprehensiveness of Google's approach towards the markets of immersive technologies. Thus the probability of the scenario and the impact of it, are significant. Yet it is to be discovered if the company will turn the less profitable areas (e.g. JUMP) into notable revenue streams.

### **5.5.5 Scenario: Facebook is the forerunner of social applications**

In the case, Facebook's subsidiary Oculus enables the social VR experiences to become a major application domain among the use cases VR technologies are applied into. Preliminarily, the thought use cases for VR are diverse, including telepresence, film-making, healthcare, military simulations, education, fashion, sports, automotive and engineering, for instance. However, an important factor to think about is to what extent VR goes social.

*"I don't think it necessarily has to be games. Social interaction is a massive draw to VR."*  
– Sam Birley (Re/code 2014)

It is probably a matter of time when VR technology breaks through in terms of social applications. Though the question is, which kind of application would be leading the social VR experience, and who would develop such an application.

*"What VR really needs is an application that's outside of gaming, but kind of a killer app for normal, everyday people."* – Keith Kaisershot (Re/code 2015)

The most notable sign of this is Facebook's acquisition of Oculus. By investing over \$2 billion in a VR company, the major social platform enables itself to implement VR driven solutions for the use of 1.44 billion Facebook users (as of the first quarter of 2015). (Forbes [1] 2015)

*"Oculus could evolve into Facebook's next generation social networking platform in addition to providing interactive immersive play for Facebook's subscribers."* (Tech by the Bay 2015)

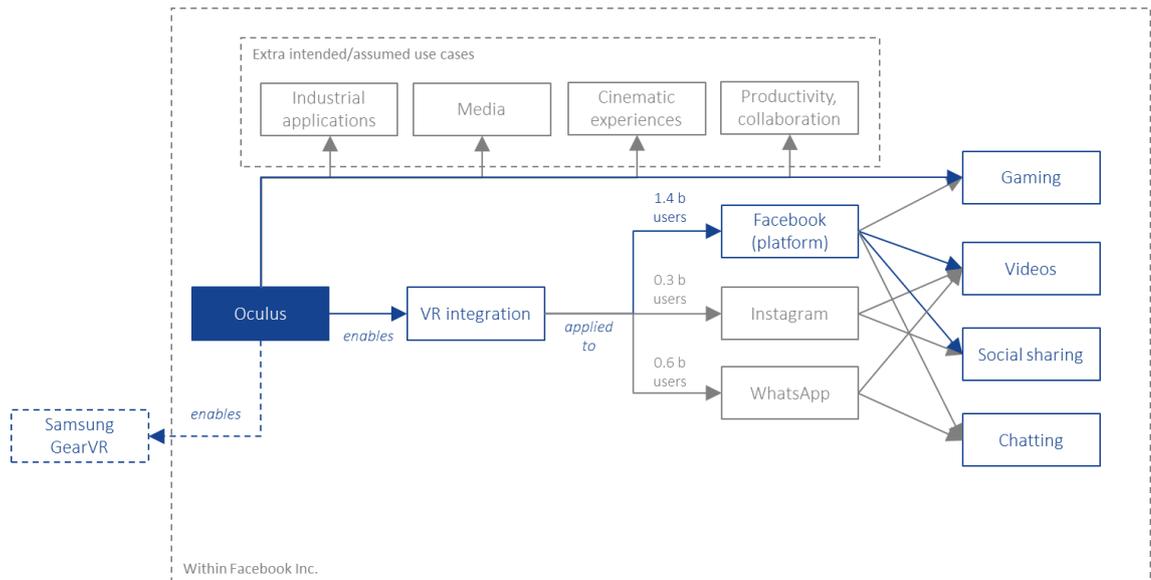
Initially developed for gaming purposes, Facebook has announced its intentions to implement Oculus technology as part of its social platform. In the long-term, Facebook executives see the VR technology to develop into actual computing platform, for instance enabling a native VR user interface.

*“Oculus has the potential to be the most social platform ever. Immersive, virtual and augmented reality will be part of people’s daily lives.” – Mark Zuckerberg (VentureBeat [2] 2014)*

By interpreting the words of Facebook’s CEO, the integration between Facebook and VR technologies seem to be inevitable. As of late September 2015, Facebook leaders believe VR to become “a dominant communications and entertainment technology”. (Financial Times 2015) As the firm has developed its social platform from casual content sharing (e.g. text, images) to videos and then again, to auto-play videos, it is not surprising that the company implemented 360 degree videos to the News Feed in the late September (2015). In addition, the service supports mobile browsing as well. Thus Facebook, as a video platform, positions itself basically in the same line with YouTube360. At the time, though, the adaption of VR video sharing is likely to be slow due to the availability of consumer cameras, and the price levels of the available ones. Facebook’s VR feature is also restricted Android driven systems, besides regular computer browsing.

*“Imagine getting up in the morning, logging into your Facebook account and virtually meeting all your friends who are online, walking inside your farm in Farmville...” (Tech by the Bay 2015)*

When considering the future of social VR, one has to remember that Facebook includes much more than news sharing. It is a platform consisting of social sites, chats, groups, events and games. Moreover, the media platform has numerous integrations to another services, applications and websites. Plus, the acquired subsidiaries of Facebook, including WhatsApp, Instagram and of course, all the efforts by Oculus, might hold promising opportunities to implement VR experiences to broader audiences (Figure 26).



**Figure 26.** An illustration of the many possibilities of Facebook and Oculus

The probability of Facebook and Oculus is high, mostly due to the significant base of users that are easily exploited into VR. The impact of the events is also remarkable.

### 5.5.6 Scenario: Mobility and affordability are the leading factors in the industry

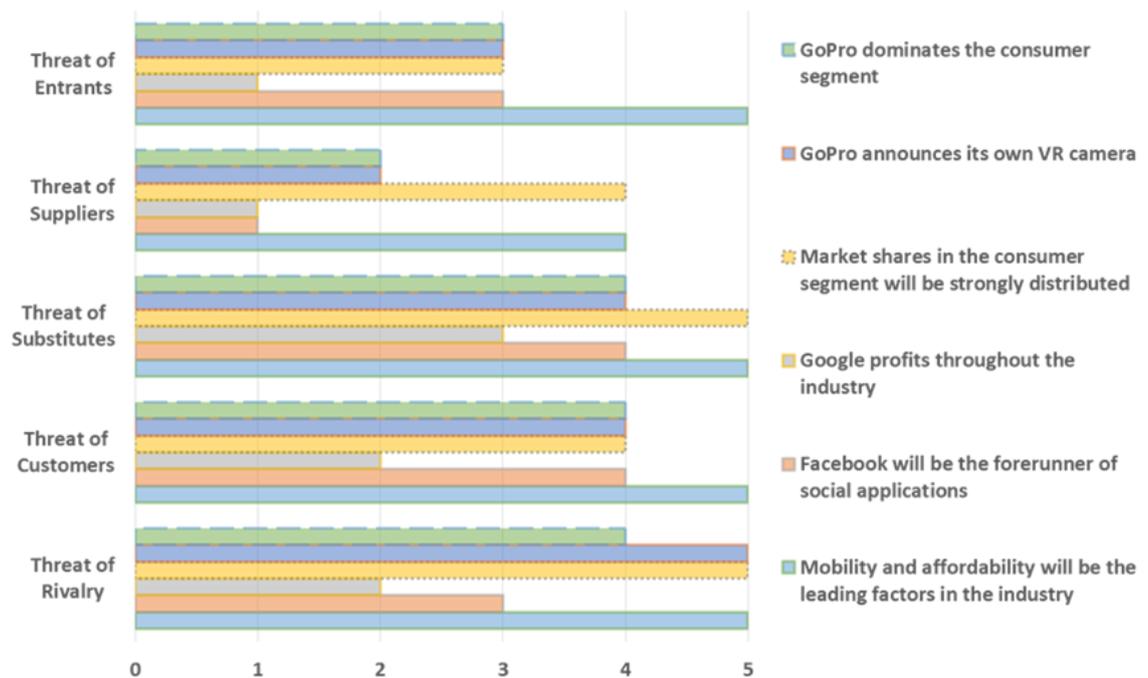
Digi-Capital lists seven factors driving the VR. These are mobility, vision, immersion, usability, flexibility, wearability and affordability. (Digi-Capital 2015) In this case mobility and affordability will play a significant part in the consumer adoption. The probability of mobile solutions to become the major VR domain, is high. The incumbent market of smart phones accommodate over 4 billion smart phones and tablets, and therefore the mobile VR segments seems to be highly promising. As many people own a smart phone, one of the drivers might be the ease of use. The users have to only buy a compatible headset, and many of them are already quite affordable. This can especially be seen from products such as Google Cardboard, Samsung Gear VR, and a number of smaller mobile HMD manufacturers that offer product that are distinctively lower priced than, for example, Oculus Rift. The probability for the scenario is certainly high, and it will have a huge impact on the industry, at least in the short-term future.

### 5.5.7 Analyzing the Scenarios

The scenario analysis concludes with the help of Porter's five forces. In accordance with the Table 3, the tool is the most commonly proposed techniques for the conduct of CI. Here, the framework helps to categorize the significance of each scenario from five different aspects that determine the intensity of the rivalry and the general attractiveness of a scenario. In theory, the tool will help the practitioner to understand the profitability and

strategic development in the industry in which a firm is operating. The use of the framework will help to determine to what extent the industry seem to be favorable for the company by analyzing five important aspects that influence the industry. These viewpoints are the threat of rivalry, threat of customers, threat of substitutes, threat of suppliers, and the threat of rivalry. (Porter 2008, p. 80)

In this analysis the framework is used to estimate the influence of each scenario on the current industry. Thus the framework is not practiced as an in-depth analysis but for the categorization and estimation of influential factors. The visualization of the conclusions is presented in the Figure 27.



**Figure 27.** Five forces analysis of the scenarios

The figure shows that the scenario on mobility and affordability as the leading factors in the industry, would have the most significant effect in the market. Also, a strong distribution of market share in the consumer segment would naturally raise the intensity of the competition and thus increasing the levels of threats.

*GoPro's domination in the consumer market* would lower the interest of new entrants. However, as the market is fresh, new products with innovative features will occur every now and then. An ultimate positioning would most likely enable GoPro to have the bargaining power over suppliers. Most of the products in the segment have substitutive features, and the cost of changes seem to be low. Therefore, in the short term future, the customers have a strong bargaining power. In the scenario, the rivalry is the fiercest between other less significant actors.

*GoPro's announcement on its own device* might slightly reduce the interest of new entrants. Yet, the announcement would not probably affect the bargaining power of the suppliers. Similarly as in the previous scenario, there are substitutive products in the market, yet there are more to come. Also, the bargaining power of the customers is strong and the rivalry would be high in general.

*A strongly divided market share* can be a sign of opportunities in the market where the competitive advantages are derived from the distinct features of every provider. Also, it signs about a highly competitive market situation. Furthermore, as the market is competitive and growing, the suppliers have a high bargaining power. The strategic relationships between suppliers will get emphasized in order to sustain a competitive capabilities. Due to the distributed shares in the market, the amount of substitutes is high. A broad offering of products enables the low costs of change, and therefore reinforces the bargaining power of customers. Hence, the rivalry is strong in the scenario.

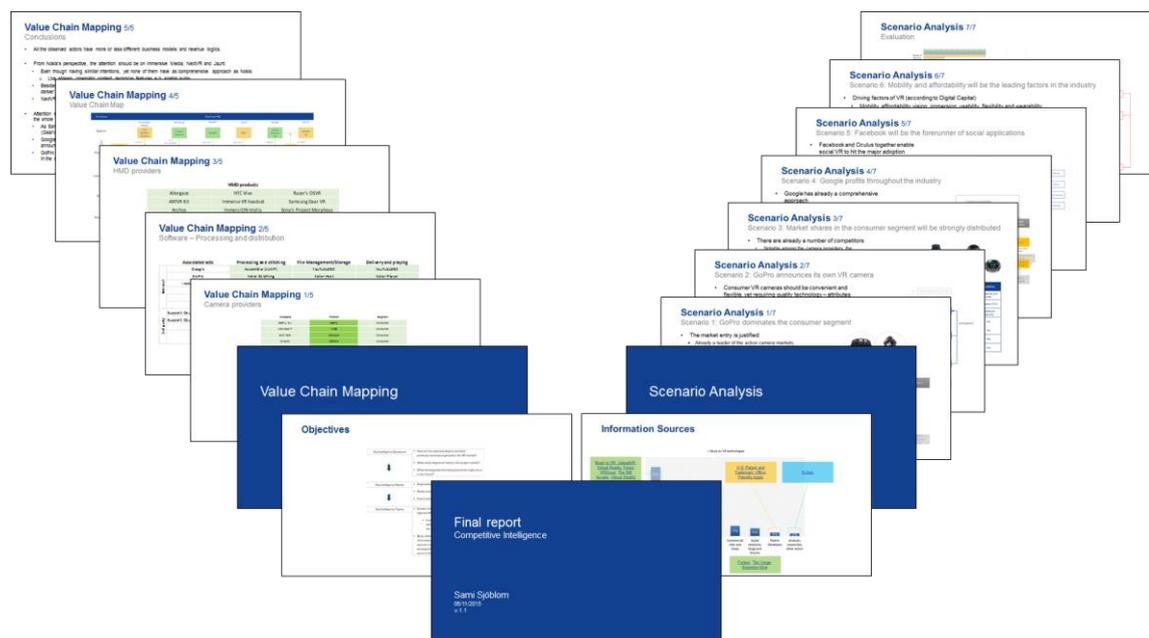
In accordance with the scenario in which *Google gains advantages in the industry in a comprehensive manner*, there are not many companies who are capable to approach the industry in a similar way. Besides having its own technological efforts, the company has invested in various firms regarding augmented reality and VR industry. Therefore, the company might make the best of these opportunities. Through the resources the company accommodates, Google would not be dependent on suppliers. However, the company would benefit from accelerated user activity in the field of VR, and especially in terms of content creation which would drive the firm's efforts in the field of online advertising. The approach in general is non-substitutable for most of the companies, yet in terms of a certain offering, some of the products or services are (JUMP rig vs. other devices, Milk VR vs. YouTube, Cardboard vs. other HMDs). However though, it is not probably Google's intention to dominate in every single field. The customers would not affect Google's approach significantly, even though the user adaption and sustainment of it is certainly important for the company. In the big view, the rivalry is low. However, a notable competitor might be Facebook, as it is not only famously operating in the VR industry, but also acquiring the market share in the online advertising in a growing pace.

Even though *Facebook might take an advantage of establishing and leading the social domain of VR applications*, the barriers to entry remain low. The greatest resource of Facebook is its enormous user base. Yet, there are numerous great promises regarding the social experiences driven by VR technology. Facebook cannot cover all of them, and is not most likely even willing to. However, the company should expect to have rivalry (performed by Twitter, Google, LinkedIn, for instance) against its main services, for example in terms of social sharing, social interactions and advertising. Also, there are innovative developers and start-ups that are striving to come up with new services regarding social VR. The role of suppliers is not significant, yet similarly as with Google, the user adaption is essential.

*Mobility and affordability* are factors that play a great role in the industry. Not only is it justified from the consumer's perspective, but it also accelerates the development of services as they commonly require only a minimal initial capital (e.g. mobile application development). Due to the skyrocketing trend, even many of the start-up companies that develop hardware have got crowd-funded with a relative ease, and some of these companies about to deliver some of the most promising consumer devices. Therefore, the barriers to entry are seemingly low, however, not necessarily for long. High rivalry will raise the bargaining power of the suppliers. Also, there is a variety of products and services which makes the threat of substitutes, as well as the bargaining power of the customers certainly high.

## 5.6 Disseminating the Intelligence

The primary product of the generated intelligence was to create a comprehensive and visual PowerPoint slide set, supported by appropriate notations of used or complementary information sources. The file was distributed to the relevant parties which meant in this case the delivery to the senior managers who have the first glance at the intelligence report. The screenshots of the report are presented in the Figure 28.



**Figure 28.** The screen captures of the report

The PowerPoint slides were chosen to act as a reporting platform due to the compatibility and integrity with Microsoft Office programs across the company and the familiarity of it, thus enabling the ease of handling of the report. Moreover, the PowerPoint slides enable one to illustrate the intelligence in a clear and visual way that is easily interpretable among the stakeholders. Further, the slides can be attached along with the other internal reports with ease and also, they can be integrated with internal files and office programs (e.g. MS

Excel, MS Word), as well as hyperlinked to the local folders and external websites (Internet). Therefore, the approach enables a broader distribution and use of the intelligence file within the organization.

The final was a compressed set of major insights with a focus on the results and conclusions of the analyses. The set held both the quantitative and qualitative data with a strong use of graphical representation of the information.

## **5.7 Providing Feedback**

The review discussion on the CI initiative took place on November 9<sup>th</sup> 2015. The discussion were on the outcomes of the process, to what extent the results were satisfactory, did they meet the objectives, and what conclusions and questions could be derived from them for the future reference.

It became clear that the CI process, which started in the beginning of the summer, provided the decision-makers with an array of relevant knowledge of the marketplace. It turned out that the outcomes were be used to support the decision-making among the management. In addition, the subject and the scope of the intelligence initiative was found highly relevant, and the process was properly aligned with the new strategic direction of the firm. This finding was due to the fact that the initiative was launched a bit ahead of its time, and there was no clear sign whether it would support the new strategy, or not. However, as the process happened to be relevant, it was confirmed that the knowledge is, and will be used as part of further analyses. Therefore, the intelligence initiative was found useful. Partly based on the results of the work, more similar competitive and market intelligence processes will be on going within the firm to develop the strategy.

Due to the review discussion and feedback on the process and its results, some of the materials were improved a bit, and sharpened into a more detailed level with complementary information. For instance, the findings presented in the value chain mapping were taken again into a new investigation and as a result, some of the insights are now presented in a more detailed manner. Also, some additional sources were acquired and added to the report to maintain the credibility of statements.

## 6. FINDINGS AND CONCLUSIONS

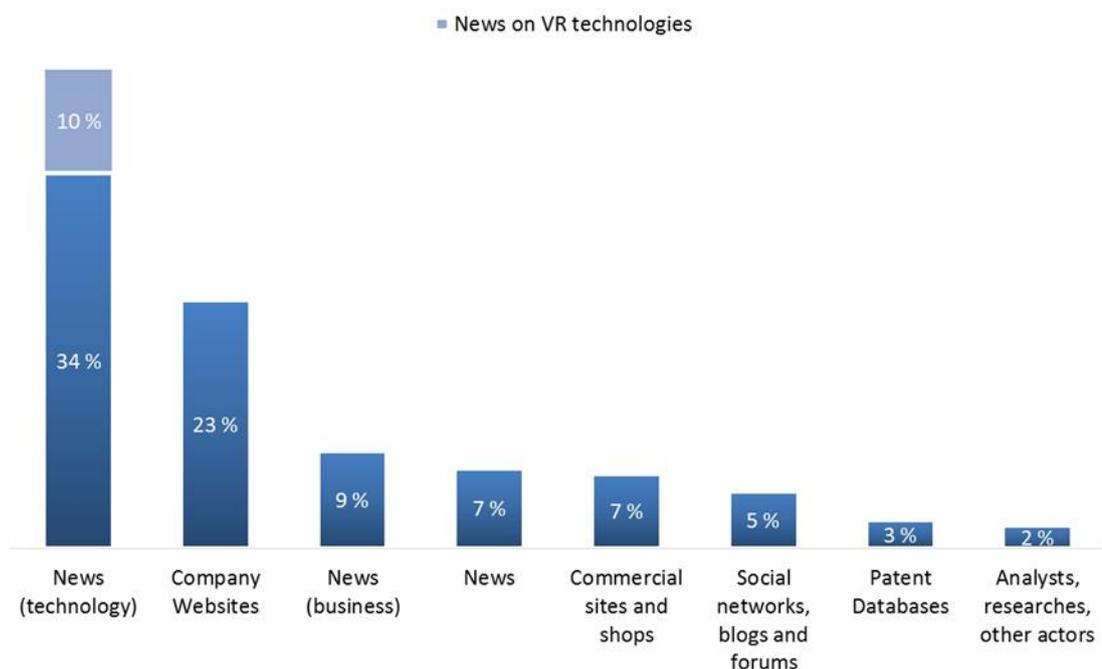
In this chapter, the key insights of the empirical study presented, encompassing the findings that occurred during the intelligence process. As the process involved several phases and activities, the chapter is divided into sub-chapters to emphasize the conclusions in regard to diverse aspects.

### 6.1 Planning

A carefully set goal and scope are a requisite for an intelligence study. When generating a framework for the intelligence process, KIT is a useful tool to be considered. In the study, it helped the practitioner to form the major questions for the process, and pointed out the key factors that one should focus on. Hence, it helps the practitioner to generate a clear plan by identifying the primary sources, and by selecting appropriate analytical tools to support the knowledge creation. Due to this, the conduct of the process stayed strictly within the set scope.

### 6.2 Information Sources

The used information sources were written down as often as possible. The documented information sources sum up to 189 instances, and the distribution of the sources are represented in the Figure 29.



*Figure 29. The distribution of information sources*

A major part of the utilized information, approximately 44 percent, was derived from websites that focused on technological development and technology markets. Part of these websites focused distinctively on VR technologies (e.g. UploadVR, Road to VR, Virtual Reality Times) which covered surprisingly only 10 percent of the used sources in general. A significant part of the information was found directly from company websites (referring to the firms that were examined), covering 23 percent of the information sources. The rest of the news sources were either about business news, or just general news magazines. Online shops and other commercial websites helped to acquire information related to products and price levels, whereas patent databases helped to uncover details on up-coming technology from competitive parties. Social networks, blogs and other user-generated content included a lot of supplementary information, thoughts from individuals on VR technologies and markets, as well as shortcuts to valuable information sources. Misleadingly, the role of analysts, researches and other actors in the industry might seem to be minimal when interpreting the figure. The small amount of these sources is a fact, yet the importance of these sources was significant. The sources – especially analyst reports and consulting companies – delivered timely, accurate and detailed information of the market. The small portion is also due to the small amount of research and consulting companies with a slightest focus on growing VR markets. However, these findings suggest that the major sources for information gathering in terms of emergent technology markets are, less surprisingly, news on technology markets, and company websites.

### **6.3 Analysis**

CI is a continuous and interactive process that should constantly adapt new and timely information regarding the business environment. A continuous and fresh information flow becomes particularly emphasized when the CI practice considers a recently established and a dynamic marketplace. Due to this the Value Chain Mapping analysis is not the most suitable approach, at least in the context of the work. An industrial value chain requires continuous monitoring to make the best use of the technique. Thus the tool is slightly static, time-consuming and clumsy approach for an agile intelligence process. On the other hand, a value chain map delivers one with an illustrative high-level picture of the market that includes the factors considered strategically important. Therefore, it can possibly be used as summarization of market knowledge to a certain extent.

Scenario analysis instead, provides the intelligence practitioner with a more flexible platform to track changes in the market. As scenarios mainly observe changes in the market in the long-term, sudden changes in the market will not necessarily affect scenarios. In addition, one can take old and recent information into account when creating scenarios. A robust base of diverse information will help one to form a complete path of development that leads to a scenario, and possibly helps to understand different strategies of players in the market.

## 6.4 Dissemination and Feedback

The way in which the intelligence is disseminated to decision-makers bases highly on preferences and procedures that a company accommodates. In the empirical study, the most convenient way to do this was to use a visual, yet an informative PowerPoint slide set to present the process and its results in a summarized form. Whilst distributing the intelligence report, the convenience of every stakeholder should be taken into account, which is another reason why the chosen format was used for reporting. Further, the technical integrity between the document and other file formats should be taken into account to ensure the versatile usage and distribution of the file.

The feedback phase was important in order to understand the significance of the results, as well as the areas of improvement. A review discussion provided the author with knowledge on how and to what extent the developed market knowledge was used among the senior management. If a new intelligence initiative would take place, an in-depth evaluation of the results should be executed that new questions and knowledge gaps could be formed for further investigation.

## 6.5 Evaluating the Study

The CI process considered a market study and an analysis of a marketplace about which it seemed to be hard to find any dedicated and detailed research work, at least for free of cost. Despite that there are analyst reports on the industry and its development and trends, CI based and strategically scoped studies on VR market do not most likely exist to a notable extent.

Furthermore, due to the use of techniques, the results shown are unique. Both the techniques, value chain mapping and scenario analysis delivered outcomes that combined information derived from a huge number of sources, and that were knit together with the practitioner's own way of thinking. Therefore, the results, at least in terms of a value chain map and scenario, are not substitutable.

The target organization received information and knowledge of the market in the form that fit the firm's strategy the best. The process delivered knowledge from the very beginning to the end, resulting in an enormous amount of new knowledge and information sources.

## 7. DISCUSSION

The aim of the thesis from theoretical perspective was to deliver both a conceptual understanding of CI, and an understanding of CI as a process. The theoretical groundwork covered the definitions of CI, the major characteristics of it as well as the related restrictions that apply to a CI practice, that were found across the literature. Also, distinguish between different types of intelligence efforts were done to highlight CI as its own area of an intelligence function. The theory also covered a study on CI process, focusing especially on CI cycle as a main framework on which the empirical study was built. Then the empirical study was conducted in accordance with the interests of the target organization.

The main research questions was “How does a CI based approach work for the conduct of an analysis in regard to an emergent technological marketplace?” According to the findings, a CI based approach provides the practitioner with a flexible base to conduct a competitive market analysis that is precisely defined and scoped, yet conducted in an ethical and legal way. Especially, the use of KITs is helpful in order to direct the process towards the desired objectives and to set up a clear scope for the analysis. However, the insights also reveal that a CI process should be an agile and a short-term initiative especially when studying a rapidly growing market environment. It is reasonable to say that the intelligence cycle should start and end within few weeks, after which the results should be reviewed and new goals be set. Then, the CI practice stays fresh in regard to the changing environment and strategic information needs. As the empirical study covered just one round of the cycle, the process took a long time and partly lost its flexibility to accommodate environmental changes. Further, the findings suggest that methodological choices can help to improve the flexibility of the process. For instance, constructing a value chain map provides the decision-makers with a robust base of information that is, however, only a view of the current state. Thus it does not deliver proactive advantages, especially if comparing to scenario analysis.

The findings proposing that a competitive analysis regarding a growing marketplace should be fast-paced process, adapt constantly new information, and should communicate with the decision-makers in a frequent manner, necessitates two topics for the future reference. Further research could consider what would be the robust combination of analytical tools that could accommodate the changes in the dynamic market, yet enabling to develop key insights and suggestions of the marketplace on a regular basis. Another topic could consider that to what extent strategically valuable information can be derived from social networks regarding an emergent technology markets, and similarly, to study how to make the best use of information sources in general that consist of a lot of interesting, yet unreliable information that could be used as an input for a strategic analysis.

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# APPENDIX A: VALUE CHAIN MAP

