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# **The Role of Artificial Intelligence in Market Analysis**

A Case Study in the Maritime Industry

Information Systems

Master's thesis

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This thesis explores how artificial intelligence (AI) can support market analysis in the maritime industry, driven by increasing environmental pressures and regulatory demands for sustainable fuel solutions. This requires maritime companies to make faster, more accurate, and forward-looking decisions. Understanding how AI can enhance both operational decision-making and long-term strategic planning through improved market insights is therefore highly relevant.

This research focuses on how firms can utilize AI to transform market data into knowledge and business value. The study addresses this through three research questions structured around organizational context, data transformation into knowledge, and business outcomes. Prior research indicates that maritime companies still rely heavily on intuition rather than structured, data-driven decision-making. To address this issue, the study applies a theoretical framework based on Davenport et al. (2001), emphasizing the organizational capabilities required to convert market data into actionable results. Additionally, the study examines the safe and transparent use of AI, highlighting the role of human–AI collaboration in market analysis practices.

The research was conducted as a qualitative case study, based on semi-structured interviews with internal experts from a maritime case company specializing in fuel solutions, and external professionals in AI, data, and market intelligence. Analysis of the findings using the Gioia method provides a key contribution of this study, the dual-structured model for AI-enhanced market analysis. It was formulated from two distinct but complementary approaches to market analysis that emerged as a consistent pattern across the interviews. The model consists of two interconnected layers, continuous monitoring (operational layer) and deep analysis (strategical layer). Continuous monitoring supports operational agility and sales by recognizing relevant signals from industry news, customer activities, and competitor actions through AI-enabled web-scraping and alerts. In turn, deep analysis enhances strategical planning, including Research & Development (R&D) by utilizing databases, customer surveys, and tacit knowledge combined with advanced AI tools, such as Retrieval-Augmented Generation (RAG).

Furthermore, this thesis presents a practical framework that supports the adoption of this model, underlining the importance of organizational processes for the implementation strategy. These contributions are particularly relevant for maritime companies seeking to build their AI capabilities in order to generate business value through structured and AI-enhanced market intelligence.

**Key words:** Market analysis, market research, artificial intelligence, AI governance, data management, knowledge management, data to results, maritime industry, fuel solutions, climate neutrality

**Oppiaine:** Tietojärjestelmätiede

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Tämä pro gradu -tutkielma tarkastelee, miten tekoäly (AI) voi tukea markkina-analyysia meriteollisuudessa, jota ohjaavat yhä enenevässä määrin kasvavat ympäristö- ja sääntelyvaatimukset. Nämä luovat paineita kestävien polttoaineratkaisujen kehittämiseen, mikä edellyttää meriteollisuuden yrityksiltä nopeampia, tarkempia ja ennakoivampia päätöksiä. Onkin erittäin ajankohtaista ymmärtää, miten tekoäly voi parantaa sekä operatiivista päätöksentekoa että pitkän aikavälin strategista suunnittelua syventämällä markkinaymmärrystä.

Tutkielma keskittyy siihen, miten yritykset voivat hyödyntää tekoälyä muuttaessaan markkinadataa tiedoksi ja liiketoiminta-arvoksi. Tämä tutkielma jäsenyy kolmen tutkimuskysymyksen ympärille, jotka liittyvät organisatoriseen kontekstiin, datan muuntamiseen tiedoksi ja liiketoiminnallisiin tuloksiin. Aiemman tutkimuksen mukaan meriteollisuuden yritykset tukeutuvat edelleen vahvasti intuitioon systemaattisen datapohjaisen päätöksenteon sijaan. Tämän osoittaa puutteen, johon tutkielma vastaa hyödyntämällä Davenportin ym. (2001) kehittämää teoreettista viitekehystä, korostaen niitä organisatorisia valmiuksia, joita markkinadatan muuntaminen päätöksenteon tueksi ja liiketoiminta-arvoksi edellyttää. Tämän lisäksi tässä tutkielmassa tarkastellaan tekoölyn turvallista ja läpinäkyvää hyödyntämistä sekä ihmisen ja tekoölyn välistä yhteistyötä osana markkina-analyysin käytäntöjä.

Tutkimus toteutettiin laadullisena tapaustutkimuksena, ja sen aineisto kerättiin puolistrukturoiduilla haastatteluilla. Haastatteluvina oli sekä polttoaineratkaisuja kehittävän meriteollisuusyrityksen sisäisiä asiantuntijoita, että ulkopuolisia tekoölyn, datan ja markkinatiedon ammattilaisia. Aineisto analysoitiin Gioian menetelmällä, ja sen pohjalta muodostettiin tutkielman keskeinen kontribuutio, kaksitasoinen malli tekoölyn tukemalle markkina-analyysille. Malli rakentuu kahdesta toisiaan täydentävästä lähestymistavasta, jotka toistuivat johdonmukaisesti haastatteluissa. Nämä tasot ovat jatkuva monitorointi (operatiivinen taso) ja syväanalyysi (strateginen taso). Jatkuva seuranta tukee operatiivista ketteryyttä ja myyntiä tunnistamalla relevantteja signaaleja esimerkiksi toimialan uutisista, sekä asiakkaiden ja kilpailijoiden toimista tekoälypohjaisen web-scrapingin ja hälytysratkaisujen avulla. Syväanalyysi puolestaan tukee strategista suunnittelua ja esimerkiksi tuotekehitystä (R&D) hyödyntämällä tietokantoja, asiakaskyselyjä ja hiljaista tietoa yhdistettynä edistyneisiin tekoälytyökaluihin, kuten hakutehostettuun generointiin (Retrieval-Augmented Generation – RAG).

Lisäksi tutkielmassa esitetään käytännön viitekehys, joka tukee mallin implementointia ja korostaa organisatoristen prosessien merkitystä sen toteuttamisstrategiassa. Tutkimuksen havainnot ovat erityisen hyödyllisiä meriteollisuuden yrityksille, jotka tavoittelevat tekoälyvalmiuksiensa kehittämistä ja liiketoiminta-arvon luomista rakenteellisen ja tekoälypohjaisen markkinatiedon avulla.

**Avainsanat:** Markkina-analyysi, markkinatutkimus, tekoäly, tekoölyn hallinta, data, tiedonhallinta, meriteollisuus, polttoaineratkaisut, hiilineutraalisuus

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# 1 Introduction

## 1.1 Background of Study

Climate change is an existential threat that requires creating and implementing new strategies to overcome the challenges that affect us all. European Union has created the European Green Deal with a goal of making EU climate neutral by 2050 through making industries and transport sustainable. This is however a challenge, since transportation causes major part of the greenhouse gas emissions while the demand for it is constantly growing as the globalization is increasing. One of the important factors for achieving carbon neutrality by 2050 is the Fit for 55 package, which includes utilizing sustainable fuels in the maritime industry. (Chiaramonti & Testa, 2024; European Commission, 2023, 2024)

Fighting climate change and achieving the goal of emission neutral transportation by 2050 in the maritime sector requires shipping companies to find emission free ways to continue their businesses across the oceans. This results in an increased competition for creating new innovative solutions looking for a breakthrough in emission neutral transportation in the maritime industry. Because of the long distance that ships travel, electricity is not optimal for maritime transportation. Instead, the use of new fuels such as renewable methanol and ammonia in shipping is increasing. (Tanskanen, 2023)

This requires companies that develop fuel solutions for maritime sector to know the market they operate in, including their customers, competitors, stakeholders, and ecosystems, as in other words conduct a market analysis. Obtaining deep knowledge in these areas leads to a competitive edge, which is critical for having a successful business in a regulated and competitive environment. This is possible through systematic and continuous gathering of the best data available about the market and analysing it in the most useful way for the organization to make informed and on-time decisions. Therefore, this thesis explores best practices for a structured market analysis process, including why, how, and when artificial intelligence (AI) should be integrated as a part of this process. Furthermore, this study investigates organizational requirements for deploying AI, including its possibilities and limitations in the market data to knowledge process. The value creation for the business is also addressed, including how the value can be unlocked and demonstrated. This case study covers a maritime case company producing fuel solutions that are also complemented by services, enhancing a successful customer relationship.



Finding new business opportunities is a lifeline for maritime companies. However, many maritime firms are still executing decisions mainly based on instincts, rather than data (Munim et al., 2020). This underscores a spot where maritime firms can enhance their processes and opens up opportunities for more structured, data-driven and technologically supported market analysis. This is especially relevant as during the recent years AI has received a lot of attention, with increasing amount of organizations implementing it as a part of their business processes. (Mikalef & Gupta, 2021) In accordance, this thesis draws a conclusion in which the firms who can successfully utilize AI before and better than others establish a competitive advantage in the markets.

The above-mentioned motivation highlights the importance and relevance of this case study regarding how market analysis could be enhanced with artificial intelligence. Many firms are not utilizing data or analytical methods as good as they could, which is especially true in the context of industrial companies. One problem is that data is constantly increasing, which makes it harder to recognize useful information from the large unstructured masses of data that is constantly flowing into organizations. (Zahra & Chaples, 1993) Even when potential data is acquired and analysed, many firms fail to turn it into knowledge that could create value within the organization, since structured models are missing. (Carneiro, 2000)

Another problem addressed is that just buying technological solutions for employees' use is not enough for getting the best value out of the investments, but utilizing AI as a value-increasing instrument in market analysis requires companies to build their organizational capabilities for AI. This requires leadership level commitment, underscoring that this is not only a technical task, but an organizational initiative. (Davenport, 2018) Even as the use of AI is increasing highly in businesses, research within the industrial environment of adopting AI is limited. (Hossain et al., 2022) The finite amount of academia in this context provides a research gap investigated in this thesis.

## **1.2 Purpose of the Study**

This study focuses on exploring how artificial intelligence can support the collection, analysis and reporting of market data while generating value for the business. This thesis addresses key questions such as organizational requirements for implementing AI into market analysis process, effective market data management and analysis with and without AI, including human–AI collaboration within the scope of this study. This thesis uses market analysis, market research and competitive analysis as terms to describe the process of assessing the market to understand its trends, demographics, competitors, and conditions through a holistic view. The case study also identifies the most critical and relevant data sources, including suitable AI-solutions adhering to the

source types and objectives. Finally, this study investigates methods to transform the market data into information and information into knowledge based on the theoretical framework by Davenport et al. (2001) shaped for the purpose of this thesis. Goal is to not only find out how AI can enhance market analysis process, but how to link AI and the market analysis as part of the firm's operational and strategic goals, underlining the importance of the organizational culture. The organizational requirements are also covered through how firms can build their AI capabilities within the market analysis domain. As a result, this change aims to strengthen the existing business with possibilities to create new business through aligning the market analysis with the company's objectives, steering the decision-making.

### **1.3 Research Questions**

The research questions of this thesis are derived from the case study motivation described above, providing comprehensive analysis of the research gap with the research questions below. These are formulated in accordance with the theoretical framework by Davenport et al. (2001):

1. Research Question (RQ1 - Context): How does the organizational context affect and enable the use of AI-enhanced market analysis?
2. Research Question (RQ2 - Transformation): How do firms transform market data into knowledge to support decision-making, with and without AI?
3. Research Question (RQ3 - Outcome): How can organizations utilize AI in market analysis to generate business value?

## **2 Previous Research**

This section provides a comprehensive view based on the existing research conducted within the domain of this study. Academia is utilized to first describe the context for market analysis, including metrics and knowledge management that enable transforming market data into knowledge. Artificial intelligence is also connected to the topic, describing how organizations utilize AI in market analysis. Background for the case study context is also described by illustrating the characteristics of the maritime sector, creating a basis for comparison in regards with the findings made in this thesis.

### **2.1 Transforming Market Data into Knowledge and Business Value: Traditional Approach**

Firms competitiveness has traditionally been viewed from either a resource-based or information-based perspective. What connects both is that competitiveness is not created by where the organization is positioned in relation to its competitors, but how the organization's internal resources and capabilities support its goals. The difference is that resource-based view emphasizes that the competitive advantage is created by having assets that are uncommon, valuable, inimitable and non-replicable (Barney, 1991). In contrast, information-based view describes organizational advantage through having higher quality knowledge, with better capabilities in utilizing, developing and coordinating it within the organization. (Andreeva & Kianto, 2012) This can be supported by robust market analysis processes that enable businesses to build their information-assets through the collection, analysis and interpretation of market data for informed decision-making. (Agu et al., 2024)

Well put market evaluation helps leadership and executives to understand the market, predict competitor moves and select the best strategy based on quality information. (Zahra & Chaples, 1993) Utilizing market analysis increases dynamic capabilities of the firm by improving decision-making and competitiveness. This is beneficial for augmentation of the firms' resources and assets, which enhances creation of new business models, more agile operations and better products. (Cao et al., 2019) The best performing companies create strategies that take into consideration the specifics of the industry they operate in. This is especially important in highly competitive environments, where market orientation has a greater impact on business performance. Especially when the business is international, conducting market research is crucial to understand the operational

environment, including customers and stakeholders in a global environment. (Lamore et al., 2013; Javalgi et al., 2006)

The goal of analysis as a component is to transform data into information so that the information can be turned into insight. Market analysis is a part of the intelligence process in organizations where the greatest value is created through the above-mentioned process. According to Vorhies & Morgan (2005) this market-based learning is crucial in creating a sustainable competitive advance. Research suggests that the market analysis in the context of the operational environment creates conditions enabling organizations to create successful business. (Fleisher & Bensoussan, 2015, p. 10; Vorhies & Morgan, 2005)

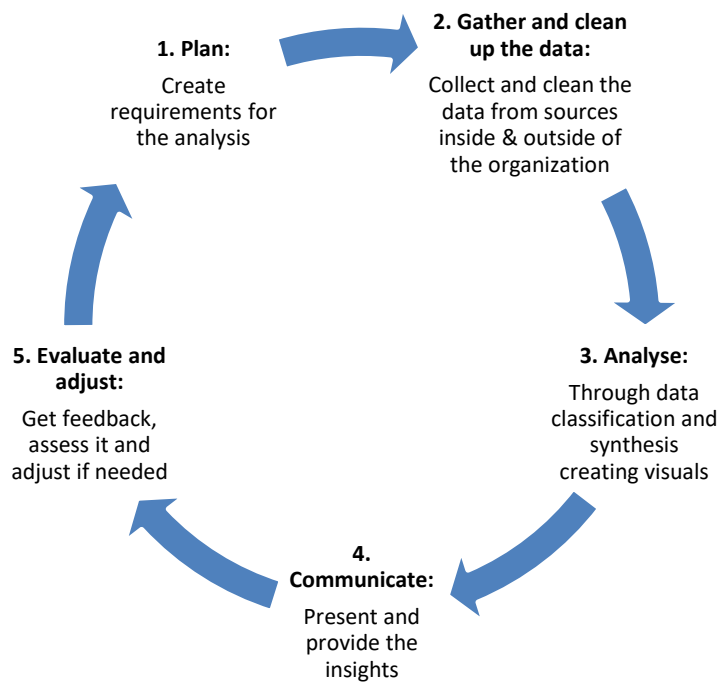


Figure 1. Intelligence Cycle according to Fleisher & Bensoussan (2015)

Firms that can successfully utilize data and manage to transform it into information assets benefit most from the analysis process. Knowledge management (KM) is one of the practices that has received considerable scrutiny in businesses and academia, since it can be used for generating, storing, retrieving, and distributing of information assets into usable knowledge. The KM approach includes human-centric aspects, such as social networking, training, collaboration, and decision-making that is based on expertise. In addition, KM has technical aspects since people alone are slow

to convert data into information and information technology (IT) is poor at configuring information into knowledge. KMs technical aspects include databases, information repositories and decision support systems. (Alavi & Leidner, 2001) Furthermore, knowledge management enables better performance in firms through enabling IT systems that support knowledge processes and HRM activities that motivate people to create, share and apply what they know. (Andreeva & Kianto, 2012) In accordance with the above-mentioned KM aspects of transforming data into knowledge, this thesis acknowledges its relevancy within the market analysis domain.

Useful research requires generating or gathering data in a way that adheres to the needs of the analysis. According to Price et al. (2015) most firms gather data for the research as a part of their daily business, utilizing traditional data collection methods. These can include questionnaires, interviews and networking at meetings or exhibitions. (Price et al., 2015). However, there is no scarcity when it comes to the amount of data in today's world, making it hard to identify the relevant data. Performing a market assessment that provides actual benefit is time consuming, requiring notable resources, insight, and creativity. Because of this complexity, the researcher must to be aware of the potential issues involved in conducting a market analysis. (Zahra & Chaples, 1993).

The barriers of analysing the market are related to availability of resources leading to difficulty in collecting the relevant data. (Bigwood, 1997) Another issue related to the data is to evaluate which data is useful for the analytical process. The credibility of the information, the sources and reliability need to be assessed carefully. Data that the analysts use to generate competitive intelligence can be classified to three different source origins. These include primary, secondary and tertiary sources that illustrate the complexity that the analysts face when defining the credibility and adequacy of the inputs utilized in the intelligence process. (Fleisher & Bensoussan, 2015, pp. 34–35) It is concluded in this thesis that acknowledging to these barriers is crucial for conducting a reliable market analysis that generates value for the organization regardless of the methods used. In this domain, defined metrics can be useful to evaluate whether the data gathered is useful or not for the organization.

Metrics or performance indicators can be defined as verifiable measures that can be based on quantitative or qualitative indicators that are in accordance with a reference point. To be fully utilized, metrics must be aligned with the business operations that create value. Verifiable metrics mean that they should be documented and understood in the context of the data, indicating that the data is generated into a quantitative or qualitative result. This comparison is usually made against a

key performance indicator (KPI), which provides a standard for benchmarking. These can be internal or external and can relate to business goals, budgeting, service level agreements or regulations published by authorities or agencies. (Van Looy & Shafagatova, 2016; Melnyk et al., 2004)

According to Farris et al., (2021) successful analysis requires performance indicators that capture the market trends and dynamics in measurable terms. Understanding causes, creating findings, and forecasting future trends requires that the analysis be driven by KPIs that leaders must carefully choose, assess and illustrate. This creates a challenge since metrics can be highly specific and applicable only in specific analyses. Some metrics also require data which can be incomplete, too vague or totally unavailable, meaning that individual metrics may be hard to utilize. (Farris et al., 2021) To address this, Melnyk et al. (2004) describe that while increasing data volumes add complexity of the operations, challenging data management, KPIs fundamentally provide data refinement by reducing volumes and improving data usefulness. (Melnyk et al., 2004).

Issues related to data complexity and aptitude of metrics are also highlighted by Farris et al., (2021) by conducting a full picture of the market dynamics through multiple performance indicators. These can be illustrated in a dashboard that is utilized to generate triangulated insights, which are derived from different perspectives. Multiple KPIs also form relations that help to create a holistic picture from isolated data points. The correct metrics enable the organizations to focus in the business, helping leaders to understand the strengths and weaknesses in both operations and strategies. (Farris et al., 2021)

Criteria regarding the business metrics can for example include main competitors and their share of the market, financial performance including sales, manufacturing capabilities and the technologies including their influence on the market direction. (Bigwood, 1997) From a customer perspective the measurements can include customer behaviour and motivation. These attributes can lead to understanding customer expectations, which helps to plan and adjust the decisions regarding marketing strategies and operations better. (Clark et al., 2005)

To summarize the research in the chapters above, traditional approach to market analysis can be time-consuming, due to human limitations in gathering and processing data into information. Consequently, this thesis examines utilizing AI in the market analysis process in relation with the use of KPI's, highlighting the importance of organizational factors when deploying AI. These initiatives are to be investigated in the following chapters.

## **2.2 AI-Enhanced Transformation of Market Data into Knowledge: Organizational Context**

Recent breakthroughs in AI tools have turned it into a vital component in modern commercial activities. These technologies can emulate human intelligence through machine learning (ML), neural networks (NN) and deep learning (DL). (Jarrahi et al., 2023) Especially large language models (LLM) constitute a great advancement within the AI technologies. LLMs can support in creating reports, managing projects, problem-solving and decision-making while allowing to be fine-tuned for the needs of a specific industry. (Kasneci et al., 2023) AI benefits also include better innovation practices. This relationship between AI and innovation is manifested as an enhanced business performance. (Sahoo et al., 2024) In conclusion artificial intelligence can support organizations in turning data into knowledge through automation, analysing large amounts of data fast, offering real-time insights and having a positive effect on innovativeness. (Keding & Meissner, 2021) These are all characteristics that can enhance market analysis components, such as data gathering, analysis and generating outputs. (Agu et al., 2024)

However, according to Jarrahi et al. (2023) many AI investments have often yielded limited results, as research suggests that without aligned organizational changes, the benefits can be hindered. This is important from a decision-making perspective, since often the perceived cost of integrating new AI technologies is considered expensive. Utilizing AI that provides value to the business can be difficult, since data quality can be insufficient or the personnel may not adequately trained to apply AI in their daily operations, which creates data privacy concerns. (Moradi & Dass, 2022)

These viewpoints reinforce the idea that AI's value can be unlocked not only through new creative technologies, but also by robust infrastructures, skilled personnel and developing both the new and existing business processes. (Jarrahi et al., 2023) This is further supported by knowledge management literature described earlier, where human centric view is at least equally as important as the IT centric view in the context of enhancing organizational performance and competitiveness. Since knowledge usually flows into the firm in a constant but unsystematic way, most organizations have had issues with developing useful strategic knowledge systems. (Bhatt, 2001; Carneiro, 2000)

Enabling effective use of the unsystematic flow of information, the knowledge system structure should be implemented in accordance with the requirements of market analysis connected with the possibilities of artificial intelligence. Building a robust KM process requires organizational culture to support its goals through a company-wide commitment. Best utilized, effective knowledge management can create an environment for an organization, where creating knowledge through

learning can solve even the most complex problems. (Davenport, 2018; Alavi et al., 2005; Gupta et al., 2000) Furthermore, configuring IT systems, including technologies such as artificial intelligence with HRM activities in organizations enables converting data into information and information into knowledge. (Andreeva & Kianto, 2012; Bhatt, 2001)

Organizations also need to acknowledge to the fact that artificial intelligence differs from most technologies since the mechanisms used by AI technologies can lack transparency. If this is the case, it operates as a black box, meaning that it is not possible to observe what happens between the data input and the output result that the AI produces. (Mustak et al., 2021)

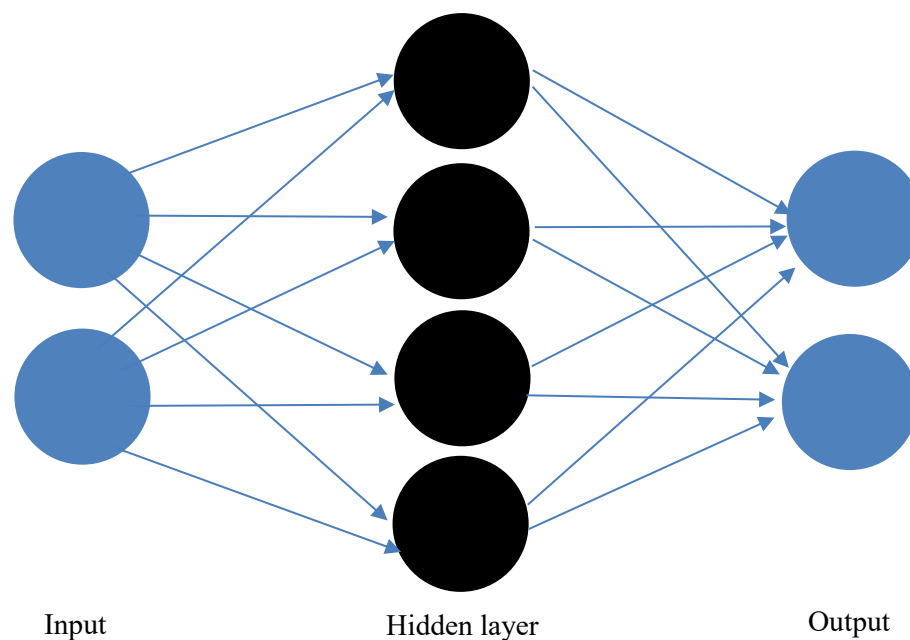


Figure 2. Illustration of Neural Network as a Black Box according to Hugh (2019)

This raises ethical concerns since the lack of transparency creates risks regarding replicating and reinforcing biases. Solution for the above-mentioned problems could involve artificial intelligence operating as a supporting actor in processes involving the use of AI, rather than it being an autonomous agent. Humans are better at addressing uncertainty through intuitive judgement, which further supports this balanced solution. (Jarrahi, 2018) The support role of AI through a supervised or semi-supervised role also makes applying AI easier, since it can be integrated in flexible ways to companies regardless of the data quality or availability in the business environments. In this



configuration, humans maintain control over the AI and are able to verify and give feedback to the model, ultimately improving the output quality. (Moradi & Dass, 2022)

In addition, firms should review how their cultural, analytical, technological, and individual capabilities meet the requirement of successful AI implementation. Companies need to establish a plan and strategy for developing AI capabilities, including a dedicated team to drive the change. It is also important to identify where the current analytical expertise lies in the firm, so that it is possible to train these experts for the use of AI. Defined targets such as what should be accomplished with AI should be assessed, ensuring that the AI investment generates business value. Depending on the firm's type, projects with rather lower than over the top ambitions, realistic timelines and working with AI-partners or consultants can provide better results. (Davenport, 2018)

Based on the research described by Jarrahi et al. (2023), Moradi & Dass (2022) and Davenport (2018) it is concluded that the most important organizational factors include AI's role as a supportive tool, where human maintains supervision over the usage. It is also crucial to define clear requirements on an organizational and individual level that enable the successful deployment of AI in the market analysis domain, which is to be explored further in the next chapter.

### **2.3 Transforming Market Data into Knowledge and Business Value: Utilizing Artificial Intelligence**

Artificial intelligence has a significant role in enhancing organizational processes, as it represents a competitive asset both socially and economically. All rapid technological changes, such as what the AI has had during the past few years, affect the operational environment of organizations. This highlights the importance of educated decision-making, where artificial intelligence can assist in applying statistical methods from real-world data and summarizing the analytical findings into results and creating insights. (Dhamija & Bag, 2020)

These rapid advances have opened up new opportunities for market analysis, such as better understanding of customers through new AI applications, which can improve the data-orientation of the organization and enhance business performance. (Mustak et al., 2021) Firms should actively monitor the markets, while the vast amount of unstructured data creates hardship in this process. To tackle this issue, AI can effectively recognize relevant data, enhancing collection, processing and analysing of the data from many sources which saves company resources and provides higher-quality information about the markets, competitors and emerging trends for the decision makers. (Taherdoost & Madanchian, 2023)

Connecting AI to Internet of Things (IoT), such as industrial systems provides strategically important data, which helps to understand customer needs with relationship marketing and can enhance the longevity of customer relationships. (Mustak et al., 2021) According to Lo & Campos (2018) relationship marketing can be defined as mutual value enhancement between the organization and its customer through utilizing data to create better customer profiles. This strengthens the company's understanding of its customers, improving the delivered value and providing a win-win situation for all parties involved. (Lo & Campos, 2018)

Based on the better targeting and understanding of customers, AI enables companies to track real-time data, allowing faster responses to customer needs and expectations, which enables more effective business. (Verma et al., 2021) This is further supported by Agu et al. (2024) who describe that real time AI-enhanced data processing allows identifying consumer preferences through "silent signals" which would otherwise go unnoticed or being noticed too late by traditional analysis methods. This sentiment analysis enabled by natural language processing allows companies to enhance their understanding about opinions and attitudes in the market, which is particularly important for strategic customer intimacy and brand building. AI-driven market analysis also optimizes market segmentation, which enables better targeting of potential customers through the correct channels. (Agu et al., 2024)

Machine learning (ML) can enhance firm's capabilities in adapting to changes in the markets. For example, better insights to customer behaviour provide improved sales through increased accuracy of product offering to customers which improves the sales. Combining this with customer data enables forecasting demand in the markets better, creating new business. (Davenport, 2018)

Neural networks, can be used in predicting volatility in the markets, having the ability to recognize patterns, correlations, and relationships even from mediocre or noisy data, where traditional statistical models would fail. The strength with neural networks comes from the ability to learn from complex data, since it can predict output based on multiple inputs. (Hamid & Iqbal, 2004) NNs can also recognize trends, do forecasting of outcomes and suggest sales strategies based on multiple datasets including historical data. (Agu et al., 2024) This can be particularly useful, since often valuable data points are scarce, which means that identifying relationships from incomplete or insufficient data can be challenging. NNs ability to learn can be utilized for example in understanding competitor actions regarding their products and pricing. (Bauer & Jannach, 2018)

Based on the factors described by Agu et al. (2024), Mustak et al. (2021) and Verma et al. (2021) it is concluded that artificial intelligence can be very effective tool in market analysis, supporting the

entire process from collection of data, analysing it into information and generating better results versus only using traditional methods. The importance of the organizational processes illustrated earlier by Davenport (2018) are also be taken into consideration when deploying AI in market analysis. Adoption of AI that provides actual value to the business requires cultural and analytical transformation from companies highlighting the significance of organizational and human domains in the AI-enhanced market analysis process.

## **2.4 Specifics of the Case Study Context: The Maritime Sector**

First it is important to define what the maritime industry entails and how market analysis applies in this case study context. Maritime industry is a highly international sector where the operations are conducted across the oceans with complex supply chains. Since the maritime sector consists of several different actors, this assembly is usually described as a cluster. (Stopford, 2010, 48–54)

According to Porter (2008), cluster is a group of companies, partners and institutions that are related to each other geographically within a common value chain. In the maritime context, Benito et al. (2003) describe that the cluster in the maritime sector consists of existing fleet, shipyards, ship hardware manufacturers and shipping consultants. However, a more recent study by Doloreux (2017) indicates that the maritime cluster is still missing a shared concept in the research, since some define the it as interlinked industries whereas others define it as network based on communities. Even though there is a common view that maritime cluster is an economical and institutional structure including collaboration between the actors in the maritime industries, it is a heterogeneous term. Regardless of not having a common concept, the maritime cluster can still be a useful framework for understanding the characteristics of the sector, enabling a more structured gathering of information and creation of knowledge. As a framework, the maritime cluster can provide maritime decision-makers with a broader view of the market dynamics both locally and internationally. (Doloreux, 2017; Porter, 2008, xix; Benito et al. 2003)



Figure 3. Maritime cluster according to Karvonen & Holma (2009)

As discussed, the maritime industry characteristics result in a complex economic structure, which requires greater effort from the researchers when conducting a market analysis that provides value to decision makers. Since the needs for market research can vary significantly, each study needs to be planned, prepared and presented carefully. (Plaza-Hernández et al. 2021; Stopford, 2010, 701–703, 710, 742) This requires firms to inspect trends and developments in shipbuilding, economics regarding shipping and what competitors are doing. (Stopford, 2010, 706) The objective is creating an analysis that operates as a continuous decision-making tool. This accumulates historical trends that allow identifying changes instead of creating a one-time snapshot of the market environment. (Bigwood, 1997).

#### 2.4.1 Regulatory Landscape and Strategic Background of the Maritime Sector

Artificial intelligence has received vast amounts of scrutiny also in the maritime industry. This means that AI is revolutionizing how traditional processes are operated within marine companies. International Maritime Organization (IMO) is placing environmental regulations for the maritime sector. This requires technological solutions which enable environmentally better fuel alternatives to meet the carbon emission targets. In this context, artificial intelligence can help shipping companies in exploring greener fuel solutions while optimizing sea routes, which reduces fuel consumption, increases profits and minimizes shipping related carbon emissions. (Ceyhun, 2020,

pp. 343–353) This change is shaping the whole maritime sector and offers new opportunities to boost efficiency, productivity and sustainability for the industry as a whole. (Munim et al., 2020)

However, even with new technology increasing in the maritime sector, it is still one of the world's oldest and most traditional industries. It continues to rely heavily on intuition instead of data-driven decisions due to the characteristics of how the sector operates. (Munim et al., 2020) This can be addressed with research conducted by Jarrahi (2018) who suggests that many of the best decisions are often made by utilizing both intuitive and analytical methods, which describes collaboration between humans and artificial intelligence. In this balanced solution, the decision-makers can act more rationally by complementing their intuition with analytical support from artificial intelligence. (Jarrahi, 2018)

Humans are better with business instincts, which do not rely on straightforward rational thinking of different choices but obtaining understanding on a subconscious level. This arises from deep experience that enables decision-making without systematic and logical analysis of different options. In contrast, AI is better at managing the complexity of the situations, identifying patterns from information depending on the situation. In this analytical approach, AI supports the decision maker by gathering, analysing and interpreting vast amounts of data, while humans utilize the “common sense” in the decision-making environment. (Jarrahi, 2018). This also applies to market analysis, illustrating the background on how and on which scale AI could be deployed within maritime companies.

#### 2.4.2 Artificial Intelligence in the Maritime Sector Market Analysis

As described earlier, the maritime sector by definition is a highly international industry including extensive supply chains with many operating actors. (Stopford, 2010, pp. 48–54) This underscores the significance of market research since international business environment highlights greater importance of understanding the market where the firms operate in. This requires comprehensive knowledge about customers, competitors, and other key stakeholders in the market. While competition increases, being market oriented creates a competitive advantage enhancing customer relationships and enabling new business to companies for example through better service offering. (Javalgi et al., 2006)

Achieving these goals requires structured market research to support corporate planning, product development and understanding how political decisions affect the business. However, usually decision makers within maritime industry don't have the time, resources or knowledge to conduct

such analysis themselves and political variables that are important in maritime context may often be outside the expertise of market analysts. (Stopford, 2010, pp. 707–708) Regarding the importance of political situation analysis in the maritime sector, Khan et al. (2020) illustrated that in stock market context machine learning algorithms had only mild impact on prediction accuracy on how country's political events affected its stock market. (Khan et al., 2020) It is recognized in this thesis that maritime market analysis is different from predicting stock market impacts, but Khan et al. (2020) study provides valuable insight into ML capabilities on predicting effects of political sentiments.

Based on the other needs and shortcoming described by Stopford, AI can create value with its capabilities of analysing large data amounts quickly and precisely, recognizing patterns and anomalies from large data sets. (Agu et al., 2024) Connecting AI's analytical capabilities with human intuition through collaboration, further enhances the possibilities of using AI in maritime sector market analysis as described earlier by Jarrahi (2018). This is also supported by Munim et al. (2020), who indicated that maritime sector is a conservative industry, still relying heavily on intuition instead of data-driven decision-making.

The emerging maritime industry includes global trends such as green energy, robotics, and IoT, all of which increase the importance of identifying new business opportunities provided by the ongoing industrial change. This transformation is often referred as Industry 4.0, which challenges maritime firms not only to anticipate change, but also to develop a robust strategies for utilizing the new technologies. (Ichimura et al., 2022) For instance, new digital products, distribution channels and logistics are complemented by AI which enables a competitive edge in the maritime sector. To obtain this advantage, companies must conduct proactive marketing management, including improved planning, integration, and oversight of market analysis processes. These processes can be supported through implementation of AI within the domain of market analysis. (Ceyhun, 2020, pp. 343–353; Özoğlu & Topal, 2020, pp. 375–400)

The combination of increasing regulation, transformation of the business processes and reliance on expert intuition makes the maritime sector particularly challenging but a relevant area for investigating the potential of AI in market analysis in this thesis. Despite the increasing integration of AI in practice, academia and research in industrial environment of deploying AI is limited (Hossain et al., 2022). The lack of scholarly in the domain provides a research gap regarding the role of AI in the market analysis, which underlines the importance and the relevancy of this case study.

In addition to the technological benefits that artificial intelligence can provide, this thesis also emphasizes the processes around the technical AI solutions, highlighting the importance of organizational capabilities described earlier by Davenport (2018). These include the ability for companies to implement AI successfully within their operations and conducting the market analysis as a continuous process instead of one-time activity as described by Bigwood (1997). Another key objective is enabling analysed data to be transformed into results as described by Davenport et al. (2001) in the theoretical framework of this thesis, which is described in the next chapter.

### 3 Theoretical Framework

This thesis utilizes framework created by Davenport et al. (2001) which demonstrate the success factors that enable organizations to build capabilities for transforming data into knowledge and knowledge into business value. Detailed strategy creates a better understanding of the analysis capability requirements. For example, an organization should be aware of the data required for the analysis metrics that benchmark its performance in order to execute the business strategy. It is also important to understand that no individual employee can have all the necessary skills to transform data into results. Instead collaboration among individuals and teams enable this transformation. (Davenport et al., 2001)

As also described earlier by Andreeva & Kianto (2012) and Alavi & Leidner (2001) regarding Knowledge Management, most companies are loaded with data from different sources, but usually the data accessed cannot be transferred into knowledge. While most organizations already have the tools for data mining, analysis and decision support which should allow successful analysis providing results, many firms still fail in this objective. This is because organizations are lacking the capability to efficiently aggregate, analyse and utilize data for informed decision-making. This issue makes it difficult to do correct measures and actions based on the data available that would provide value to the business. While KM literature describes the importance of human resources, Davenport et al. (2001) concludes that organizations do not emphasize enough the importance of human and organizational initiatives in the data to results transformation process. The main issue is that investments in technological tools and data systems are seen as enough to enable the company to thrive. Organizations must also focus on cultural, strategic and structural aspects, so that the investments into technology pay off. (Davenport et al., 2001)

Based on the above-mentioned description on how Davenport et al. (2001) focuses on human and organizational initiatives with emphasis also regarding cultural and strategic contexts in the data to results transformation process, it suits the purpose of this study well. Since utilizing AI or technology in general is not primarily a technical matter, but an organizational and human initiative the framework by Davenport et al. (2001) underlines the goals of this case study. Since the maritime industry still operates mainly through business intuition and instincts as described by Munim et al. (2020), this further highlights the relevancy of the framework in this case study. It also makes it possible to provide novel insights to the research gap described by Hossain et al. (2022) and makes this study different from the previous research regarding the topic.



The framework consists of three key elements: the organizational context, the data to results transformation process and generating valuable outcomes. Davenport et al. (2001) created the framework for transaction data and business analysts, but in this thesis the framework is aligned for the context of market data and market analysts.

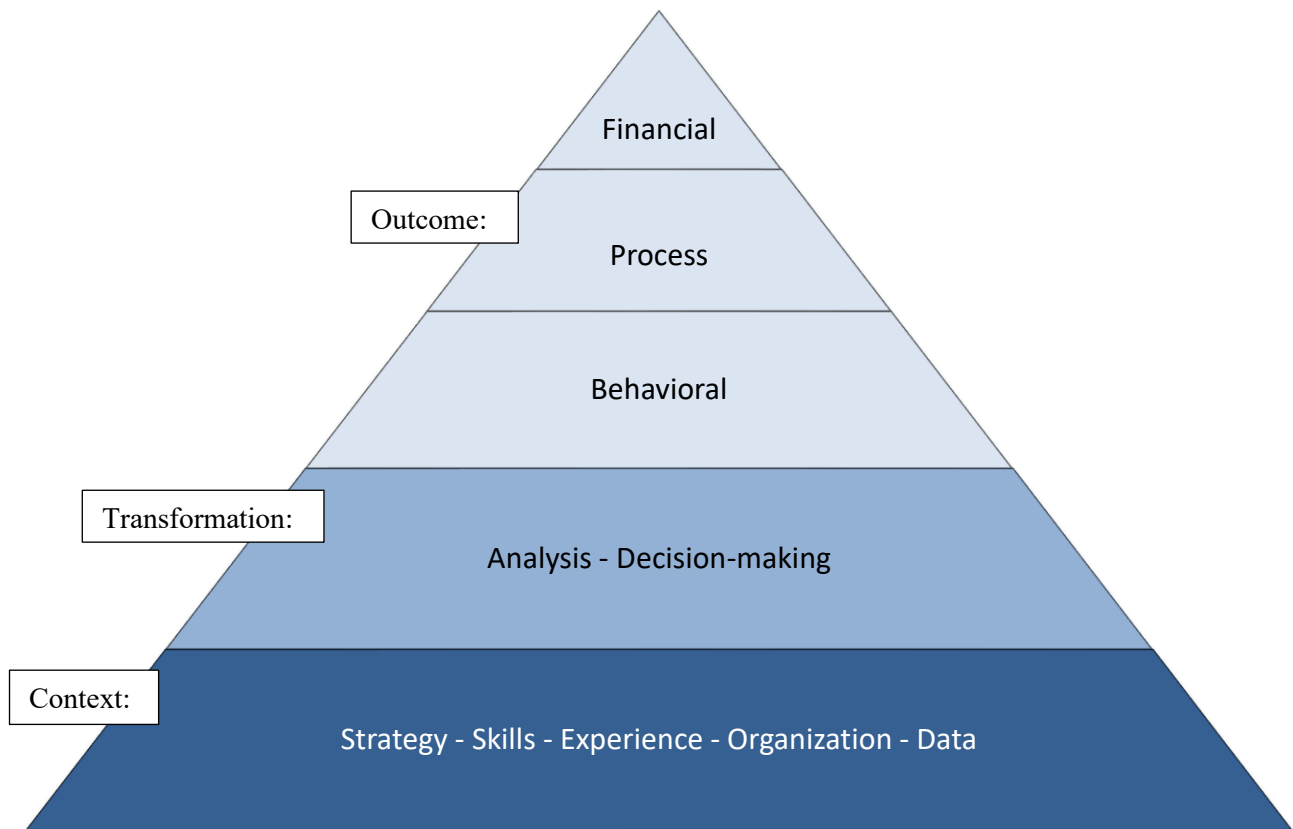


Figure 4. Theoretical Framework for turning Data into Knowledge and Results according to Davenport et al. (2001)

The framework in the empirical section is utilized for answering the following research questions:

1. Research Question (RQ1 - Context): “How does the organizational context affect and enable the use of AI-enhanced market analysis?”
  2. Research Question (RQ2 - Transformation): “How do firms transform market data into knowledge to support decision-making, with and without AI?” and
  3. Research Question (RQ3 - Outcome): “How can organizations utilize AI in market analysis to generate business value?”
- The framework suits this purpose well, since in this thesis the research gap is about building a similar capability of transforming data into results, with just slightly different definitions.

In addition to the theoretical framework this thesis utilizes the human–AI literature described earlier for creating background context about on the specific level and role that AI could be utilized in market analysis. In the literature it was described that AI connected with human intuition enables controlled but successful use of the technology. In this balanced solution, artificial intelligence is utilized as a supporting tool for its superior analytical capabilities, whereas humans verify the AI's output and make the final decisions by utilizing their intuition through abstract and comprehensive understanding. (Moradi & Dass, 2022; Jarrahi, 2018; Andreeva & Kianto, 2012; Bhatt, 2001)

Furthermore, the figure 4, framework by Davenport et al. (2001) complemented by the human–AI collaboration literature steered the data collection in this study. These were utilized to formulate the interview guides that are in the appendixes of this thesis. The interview questions for the case company experts highlight the contextual level of the framework, creating understanding about the current cultural, strategical and data environment in the case company. These were used to understand what kind of change would be required from the case company to successfully adopt AI the market analysis initiatives. The framework also steered the interview questions regarding turning the data into results as illustrated in the transformation and outcome sections of the figure 4. These were supported by the human–AI literature, such as Jarrahi et al. (2023), where the interview questions sought out AI's role in the market analysis process, including how it can complement human expertise in decision-making. Finally, guided by the theoretical framework, the scientific contribution of this thesis is derived from the synthesis between the empirical data and previous research.

## **4 Research Methodology**

This chapter provides an overview of the methodological selection applied in this study. The research approach, including the integrity and ethics of the study are evaluated. The empirical study, covering participant selection, data collection and analysis with Gioia method are also explained and justified.

### **4.1 Selection of the Methodology**

This study adopts a qualitative research approach, as it emphasizes understanding of the cultural and behavioural contexts. (Myers, 2019) In this thesis this helps to generate insights into market analysis, including the motivation for decision-making and the ways how market analysis can support this process. Case study as a choice for this thesis supports the goals of this research as well as the information systems (IS) domain. This is because organizational aspects, rather than technological elements are focused increasingly in the field of IS. (Benbasat et al., 1987) This is further supported by previous research in this thesis, including Knowledge Management scholars and Davenport et al. (2001) theoretical framework, which both underline the organizational importance when integrating data with technological solutions to the business and decision-making.

Furthermore, qualitative methodology is utilized to seek empirical evidence to the research, since it aims to understand phenomena by exploring the purpose of the study, challenging potential presumptions. This approach allows for a deeper examination of the research gap within a business-related context, which suits well the motivation of case study. Through this methodology, it is possible to create new information and knowledge. It helps to understand how people and processes work in the real environment, why they currently work in such a way, which allows the enhancement of the existing practices. In contrast, quantitative research mainly deals with analysing structured and standardized data through statistical methods. This makes it incompetent for understanding motivation, meaning and reasoning behind decisions and actions, that are essential in the scope of this study. (Eriksson & Kovalainen, 2015, pp. 4–6, 8)

Based on the context of this study and the methodology selection description above, it is concluded that qualitative methodology suits well the purpose of this case-study. It allows exploration of potential answers in a contextual manner to the research questions of this study. These include for which decisions market analysis is used for, with process phases explained and seeking out on why, how and to what extent AI could be utilized for this initiative.

## 4.2 Participant Selection

For the empirical section of this case study a total of six experts were interviewed. First three of the interviewees are working for the case study company in separate roles and the other three are external professionals working with AI, data, and market research topics in various positions. This enables creating versatile overview of the current situation of market analysis and use of AI for the case study, including organizational strengths, weaknesses, role-based needs, and expectations regarding the research topic. Interviewees C1-C3 represent case company experts, while A4-A6 are external AI experts.

The case company experts all had extensive experience working in the maritime sector, having a deep understanding of the industrial context. This is necessary to create a comprehensive and robust understanding of the market analysis environment in a case study setting. The AI experts had experience creating software solutions for maritime firms and sparring on how AI could benefit companies within the sector. The AI experts were chosen for this study based on their versatile and long experience working with data and AI in different contexts, including building AI solutions, conducting AI research and providing consultation regarding AI governance and AI in market analysis practices. Their extensive experience additionally included data management, leadership, entrepreneurship, academia and transforming traditional organizations into being data-driven within the scope of AI. These are all attributes that enhance their expertise in the context of this case study.

From the perspective of the study's theoretical framework, the case company interviewees especially highlight understanding of the context and define the needs for outcome, whereas the AI experts underline the transformation process. This is especially true for interviewee (A4) who is specialized in technologically enabled organizational changes and interviewee (A6) who has expertise in AI enabled market research and transformation processes. Also, the interviewee (A5) is an CEO for an IT company providing software solutions, including AI solutions for maritime companies. These characteristics underline the relevancy of their experience for this case study. The detailed background of the interviewees is anonymized for the purpose of protecting their identities.

Interviewee (ID)	Title / Role	Experience	Interview Date	Interview Length	Group
Interviewee (C1)	Sales Director (New Projects)	< 15 Years	19.03.2025	50 min	Case Company Experts
Interviewee (C2)	CEO (Maritime Sector)	< 25 Years	20.03.2025	37 min	
Interviewee (C3)	Sales Director (Services)	< 25 Years	25.03.2025	51 min	
Interviewee (A4)	Entrepreneur, Researcher	< 30 Years	09.04.2025	54 min	AI Experts
Interviewee (A5)	CEO (IT Sector)	< 25 years	10.04.2025	60min	
Interviewee (A6)	Data & AI Research Manager	< 10 years	11.04.2025	48 min	

Table 1. Interviewees and Their Backgrounds in this Case Study

### 4.3 Data Collection and Analysis

The study's empirical research is conducted utilizing semi-structured interviews. There are two sets of semi-structured interview guides, one aimed at the case-company experts, and one aimed for AI, data, and market analyst experts. These guides were created in accordance with the theoretical framework of this thesis and steered the empirical study, aiming to answer the research questions and addressing the research gap. All the semi-structured interviews were hosted remotely utilizing Microsoft Teams, allowing flexibility for the study and the participants.

The data collected from the interviews was first transcribed in Finnish utilizing Microsoft Teams. The transcriptions were corrected manually by hand. After edits, the material was analysed utilizing the Gioia-methodology, which helps to apply systematic discipline with analytical reasoning. This leads to robust interpretations from the data, aiming to back the conclusions made in this study. Specifically in the context of an organizational study, fulfilling of potential for description, explanation and prescription are needed to understand the relevant concepts behind the words and constructs, validating the work. (Gioia et al., 2013)

In the Gioia-methodology, the first order concepts that are found from the interview data are structured into 2<sup>nd</sup> order themes, which help to build a systematic analysis of finding similar or

different themes around the interview questions. These themes are then synthesized, enabling analysis of the data from the ground up into concepts and aggregated dimensions. Connected with the literature, the study aims to not only find supporting themes but to see if there are new concepts discovered. (Gioia et al., 2013) Some of the Gioia-analysis was done or improved again after the initial analysis phase, so that the research questions could be addressed in a more precise way. This allows presenting the results in a comprehensive but detailed way in the 5. Findings chapter of this thesis.

To emphasize the results of the interviews and Gioia-analysis, the interview quotations and coding were translated into English mostly manually. ChatGPT and Google Translate were used for supporting in the translation of specific terms, while addressing the data protection of the participants. The use of AI tools is also addressed in the 4.4 Ethics section of this thesis.

The AI experts shared perspectives on what is required from an organization for a successful AI implementation and what executives need to understand when deploying AI. The quotes of the case-study company's experts provide understanding for the needs behind this study, including the motivation for adopting AI in the market analysis process. To seek out answers to deploying AI in this task, the experts for the domain expressed opinions on how it could be used in market analysis. Based on the context of this case study, some concrete examples are also derived from the results of this study, providing contributions to practice.

#### **4.4 Research Ethics**

It was addressed to the participants of this study that the participation is completely voluntary. Before starting the interviews, the purpose of the study was explained, including the context of market analysis and AI in the scope of the case study. Consent was acquired for recording of the interviews, including explaining the technical methods of recording with Teams and via smart phone for back up. The researcher also explained that the findings are processed with confidentiality and that any personal details are anonymized for this thesis and that they will be destroyed once the thesis is public. All the interviewees acknowledged to these details before their approval for the interviews.

As of 4.1.2024, University of Turku has encouraged scholars to utilize AI as a part of their research. This thesis adheres to this recommendation and describes how AI tools were used as part of the research. Open AI's ChatGPT (LLM) was used to help to create ideas around the topic and research questions of this thesis. This tool was also utilized in translating terms or sentences, proof-reading

of texts, including grammar and sentence structures. This helped the researcher of this thesis to reduce unnecessary repetition of words and to use more correct definitions on abstract concepts. In addition, Keenious Research Explorer was used to find relevant research for the previous literature section. Google Translate was used for finding synonyms for some words in order to make the writing more academic and diverse. The output produced by these tools was not used in the exact way the AI produced it but for providing ideas for which the researcher then created the text on their own. This thesis follows the policy of where the AI user is responsible for the accuracy of the content created.

## **4.5 Evaluation of the Study**

To evaluate this study, the validity and reliability of this thesis are addressed. Validity explains how well the research was illustrated with the data collected, while reliability defines how well and systematically the research methods were conducted in the context of the case study. (Eskola & Suoranta, 1998)

The researcher was not previously familiar with the maritime industry, which meant that the researcher didn't have deep expertise or knowledge about the specifics of the sector. This however can provide new ideas generated outside of the industry, which may provide innovative ideas or perspectives in the context of the case study for the case company. Supporting the researcher, the case interviewees had extensive experience in the sector, which underscores the validity of the results regarding the case study and maritime industry context. Since AI wasn't the core competence of the case company interviewees, this research utilized external knowledge of AI experts. The AI experts had decades of experience working with data and AI results, enhancing the validity of the findings and contributions.

The interviews conducted in a semi-structured method allowed the researcher to ask additional questions if needed, providing broader but focused results for the purpose of the study. To enhance the validity of the results, the interview guide utilized in this thesis had a final question for each interviewee to demonstrate possible relevant ideas to the topic that they felt weren't addressed during the interviews.

The Gioia-method described earlier was utilized to analyse the results in a systematic manner. This provided robustness to the reliability of this study, disclosing systematic and efficient way to analyse and code the findings of the interviews for this thesis. Some of the analysis was conducted

or shaped again while writing the results to enhance the accuracy of the results in accordance with this case study, including the theoretical framework and the research questionnaire.



## 5 Findings

The comprehensive findings of the empirical study are introduced in this chapter. The findings are derived from the Gioia-analysis conducted on the interview data. Detailed quotations provide direct empirical evidence for the purpose of this study.

### 5.1 Building Organizational Capabilities for Artificial Intelligence

This chapter examines how organizational context affects deploying AI in market analysis and what is required from an organization to implement AI in its market analysis practices. From the interviews it became apparent that implementing AI as a part of operations is not just a technical exercise, but a strategic initiative enabled by commitment of the leadership and integrating IT closer to the business.

*“Leadership commitment is decisive, so do the executives use AI themselves, and do they make decisions based on data? For example, if sales development needs to be illustrated, is CRM opened or do people just explain? Organization’s ability to adapt its processes and utilize technology is primarily not a technical question, but a cultural question, which is then connected to technical capabilities, personnel competence and shaping of processes. I think this all goes into the very details where executives make data-based hypotheses that they validate in the markets and which they use for decision-making. Everything else then follows this” – A4, (Entrepreneur & Researcher)*

*“I think the CIO (Chief Information Officer) needs to be closer to the business, as technical solutions cannot be anymore just something that the IT owns.” – A6, (Data & AI Research Manager)*

A4, Entrepreneur and Researcher and A6, Data & AI Research Manager also further described what makes an organization data driven.

*“It is a fundamental question if organization is data-driven or not, and in case it is not there’s a chance to learn from other industries a lot. For example, Spotify has a DIBB (Data, Insights, Beliefs and Bets) model, in which all decisions are based on data, and no decision is done if it doesn’t go through this model. In contrary there is the classic HIPPO (Highest Paid Person Opinion) model, where all decisions are based on whoever has the highest salary in the room. The more decisions are based on data, the better. But even if firms say that they are data-driven, that might not actually be the case. One time we had a lot of pricing analytics in one firm and when the final decisions were made, the executives made up the prices based on their feelings and the analytical solutions that cost millions were shredded and abandoned.” – A4, (Entrepreneur & Researcher)*

Where interviewee A4, Entrepreneur & Researcher pointed out that use of AI is connected more to involving leadership and organizational culture than technical matters, the interviewees A5, IT CEO

and A6, Data & AI Research Manager emphasized that the will to use AI is there, but since the change has happened so fast with the LLM-breakthrough, organizations don't have the capability to implement AI, since they don't know where to start and how to start.

*"I think it is about the willingness and that there are sufficient resources, money and possibilities to utilize and enhance [AI]. From market research perspective the basics need to be in order. Who are the customers and who are to competitors we want to follow so that we can align the [AI] correctly. I've seen that companies have the will to use AI, but many don't have the capability to do so yet, because generative AI is so new, such as cloud used to be 10-15 years ago. – A5, (IT CEO)*

*"Employees are going to use AI no matter what, so I think the lean-in attitude in organizations is crucial. This means creating practices and clear responsibilities for handling data. Companies should use controlled and safer AI solutions created for enterprise use. High-level plans and readiness for the change needs to be in place before broader adoption. I think the most important thing is not technology itself, but that someone in the organization takes ownership of the change and drives it" – A6, (Data & AI Research Manager)*

Solution for this was understood in the case study company, where C1, Sales Director (New Projects) described that implementation of AI could happen step by step. This illustrates that the change will not happen under night, but gradually once organizations learn more about how AI can be used, what needs to be considered when implementing AI and what the use of AI requires from its users.

*"I think the use of AI will gradually increase. I think we humans also have a lot to learn about the possibilities of AI and the basic user who is still learning to use it needs to start slow. This way the role of AI can increase in the firm, and you learn to trust it which can make the person using it a bit blind I would say. But I think we are going to a direction where the use of AI is going to increase" – C1, (Sales Director, New Projects)*

It was acknowledged in the case interviews that AI hasn't yet been utilized in the market analysis for the case company but based on the results it is seen a strategically important initiative from a market analysis and a business point of view.

*"I think all areas of market analysis could be improved [with AI] but let's say that the most important is forecasting. For being able to understand or forecast trends, the analysis needs to be extensive, because otherwise wrong decisions are made. If the goal is to be carbon neutral by 2050, then there needs to be enough of green fuel manufacturing plants being built. And if this is not the case, then the goal is not going to be met. This is connected to politics, financial instruments and interest rates, and for example, the time being, it is quite unlikely that new green fuel manufacturing plants will be built in the USA over the next four years". – C2, (Maritime CEO)*

*"As the carbon neutrality is discussed a lot, there must be some smaller steps that we could do, so perhaps [AI] could help gather this kind of information. If we could know*

*these things couple years before [regulators implement] these changes to shipowners, then we could do something proactively to help the cause” – C3, (Sales Director, Services)*

Based on the results of case company, they expressed that AI could create great value in the market analysis process, especially in forecasting since it is important to the business. This is in line with what A5, IT CEO said about that the willingness is there and executives have noticed the possibilities of AI. The problems are more related that the knowledge how to do things is not there yet. This creates the basis to implement AI, since even though AI hasn't yet been used in market analysis, the executives of the case company have used generative AI tools in their daily work and the attitude towards of the use of AI is positive.

*“I have started to use generative AI, it helps me to write and check emails, so mainly for making basic tasks more efficient. I've really liked it, and it should be used more. I have a strong belief that AI is going to revolutionize how we work very soon.” – C1, (Sales Director, New Projects)*

*“[I've used] generative AI mainly, it summarizes and analyses articles and agreements for me.” – C2, (Maritime CEO)*

The AI experts also emphasized that organizations shouldn't try to do everything on their own when building AI capabilities but having a professional in the domain to guide them through the AI implementation process, connecting the expertise of both parties creating synergy.

*“I discuss a lot with people who know how these things work, and they can advise on where to start. There are also many companies that have helped other firms to develop AI solutions for them from zero. Also, if I think this from a consultant perspective, even we develop these solutions for ourselves and when we do it, it helps us to understand how we could do this for others also. So, company doesn't have to do everything by themselves, they can, and they should ask support from the ones that are already more experienced and specialized in it.” – A6, (Data & AI Research Manager)*

*“If we think about AI capabilities, we have built services for it, so we help our customers to do it. The main idea there is to deal with the needs [of the customer] together. We bring the AI knowledge to the table and the customer immediately gets to know how hard something is to implement and execute for them and how much would it cost. This is what we do as a service for larger companies.” – A5, (IT CEO)*

In addition to getting external help, the AI experts perspective in implementing AI included the case company having a clear idea of what could the benefits of AI be. These include defining the measures where the market analysis and AI should be linked to. It was also emphasized in the interviews, that it is important to do collaboration within the whole organization when implementing AI solutions.

*“I would be very concrete about what is the belief on what can be achieved, what are the relevant silent signals and what are the key measures. I personally would start with a small team who is interested in data and these [AI] solutions to develop, to learn and to prove that something can be derived from this [initiative]. Then I would start scaling it and quite quickly do a loop around it. I would also ensure that the most important people are included in the process so that it is not just an IT exercise, but a business-oriented activity. That would be the most important thing.” – A4, (Entrepreneur & Researcher)*

*“Well, I think first it should be thought that what is the goal. So that it wouldn’t be just about jumping on the hype train, but that it has an intended purpose. If the company already knows that their employees use AI tools on their own, that could be a good starting point. It could be discussed with the employees and ask them how we can help you to do your work in a better way for example in the context of market analysis. In my previous team we had people of all ages. Some were very experienced, and some were quite new. The most important thing was doing together. This way we sought out what should be asked from the generative AI and when. Having supportive colleagues around you is better than having technical experts [for learning], since it makes the process easier and from my perspective the older colleagues have appreciated this collaborative approach a lot.” – A6, (Data & AI Research Manager)*

*“I think the most important thing is to do these things together and that the learning and development are done transparently. This way we can avoid having the [firm’s] different units to do same things separately at the same time, without knowing what is happening around them. So, by organizing and by clarifying responsibilities it is possible to get quite far. I also think that every larger company should adopt an AI strategy or a policy, to have a little guidance on how we do these things around here, with what technologies and what tools. Then supervisors or teams wouldn’t have to think these from the ground up, since there would be a handbook for it. This would enable focusing on what is creating value and solving problems, instead of always thinking how to manage the basics.” – A5, (IT CEO)*

Based on the interviews it is concluded that starting with small team of motivated personnel, involving executives early on, ensuring clear responsibilities and having AI governance in place is essential. The case company sees AI as a strategic opportunity with leadership included which is in line with the views mentioned above. The executives still however need to give data-driven decisions a chance if AI solutions are to be implemented. This ensures that decisions are not only executed based on the intuitive feelings, making potential AI investments useless. Gradual start with business in focus seems to be the realistic option and if more comprehensive solutions are to be created, external support should be considered, since AI is not within the expertise of the case company. These results are also presented in a Gioia structure, illustrating on how companies can build their AI-capabilities by answering to the RQ1: “How does the organizational context affect and enable the use of AI-enhanced market analysis?”

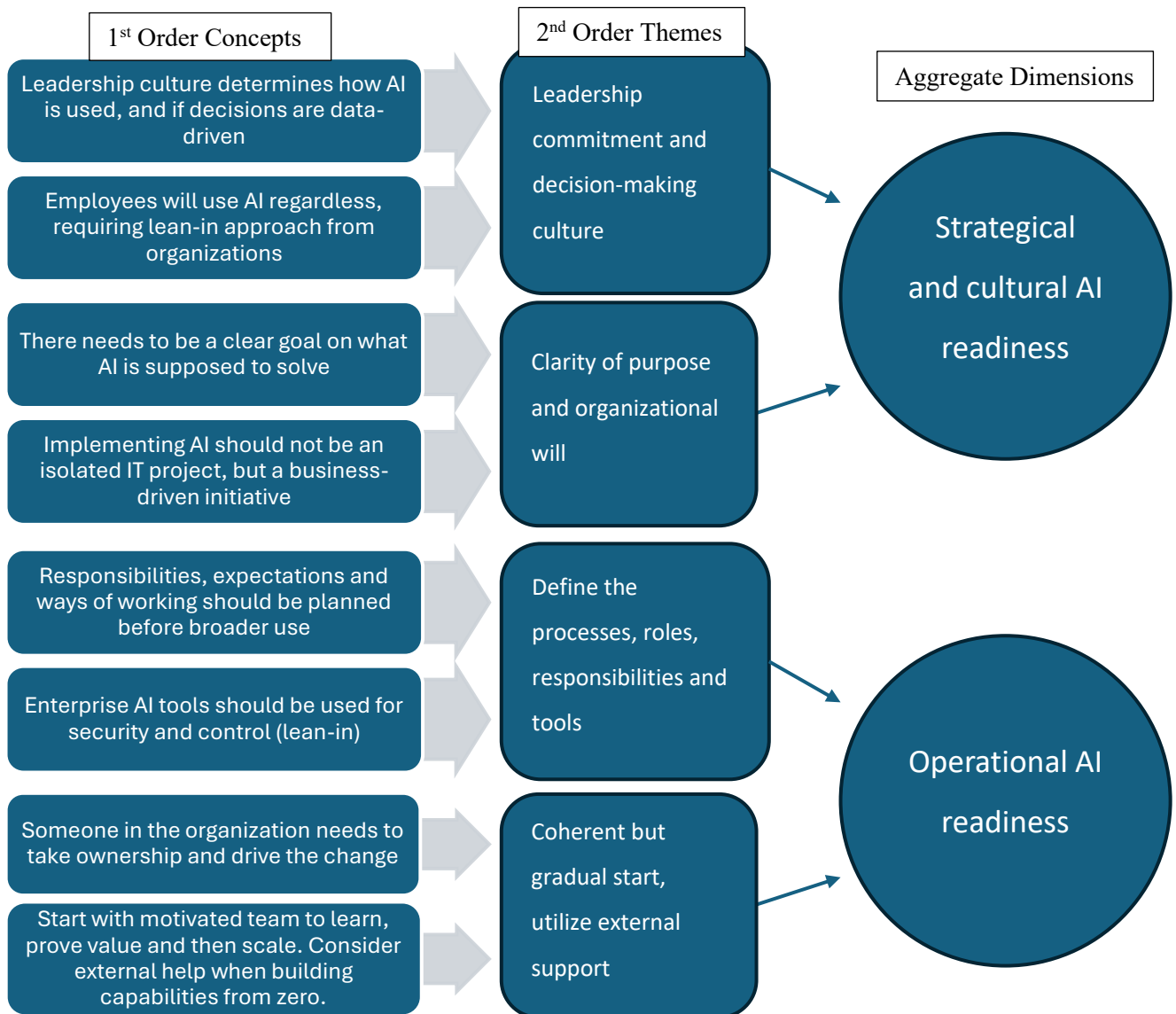


Figure 5. Gioia Structure: Building Organizational AI Capabilities (RQ1 - Context)

## 5.2 Operational and Strategical Purposes of Market Analysis

This section describes interviewees' perceptions on the operational and strategical purposes of market analysis. This highlights the current situation within the case company, including challenges and potential for improvement with AI-driven solutions. All the case company interviewees recognized the importance of market analysis for enhancing the business, creating value from new products and services, improving the customer experience.

*"Yeah, market information is utilized a lot. In this occupation you need to constantly follow what is happening in the market. Where the market is heading, what are the new trending things and how they suit into our product portfolio. We are also aiming*

*towards more customer centric thinking, where the customer is at focus and then we try to elevate that into a key account management type of a relationship. And to be able to understand the customer better, we need to also follow the market closer, what type of a customer they are and what is important for them.” – C1, (Sales Director, New Projects)*

*“CEO is responsible to the board of directors and the board is interested in knowing what is happening in the markets, what competitors are doing, what customers are doing, so gathering market information and conducting the research is at focus. When we want to develop the organization and we want to enhance our sales, we need to know where we should go and where we shouldn’t go.” – C2, (Maritime CEO)*

*“One is creating better awareness of our products and to enhance our services. We use this trending term customer intimacy, in which we aim at, and this is something we are building. This way [through market analysis] we can get better relations with the customers, which enables us with better knowledge on what we should do.” – C3, (Sales Director, Services)*

The case company interviews especially emphasized understanding the customer and enhancing the sales based on market analysis, highlighting the importance of the market analysis from the operational perspective. Better business can be achieved by building better relationships with the customers. Strategic perspective was also emphasized by the fact that the board of directors are interested in the results of the market analysis. The case company’s CEO further elaborated on both strategic and operational purposes.

*“The market data and market analysis are mandatory so that the strategy can be executed, steered, and decided what the actions are. Because if there’s no data backing up [the decisions], then we can just make up the numbers and that is no use. If you can’t define to employees what we need to do to achieve the business goals by a set deadline, then you get nothing.” – C2, (Maritime CEO)*

This is important, since the interviewee A4, Entrepreneur & Researcher stated that even though firms invest into analytical solutions, the leadership might not use the results provided and still rely on their intuition. The interviews also revealed how market analysis is conducted within the case company. Market analysis is not done very systematically in the company, but the sales organization does a constant screening of markets independently, sometimes even during personal time.

*“You need to be quite active with following the market news, everyone in my sales team does it, usually through LinkedIn. You also need to be quite active in it during personal time, but it is done in a good will kind of way, because these things are also interesting outside of work. If we wouldn’t read news partly in our free time, then a lot of things would be missed. In the market department they do it on a more coordinated level, thinking about what channels to use, what works and what could be tried, but in our daily operations salespersons do it on their own with the tools they have. However, we*

*don't have single structured process or a place for market analysis, where the market situation could be checked. Usually, the Marketing Director does these in an ad-hoc kind of way, and then the market information we receive operates as a shared belief inside of the firm.” – C1, (Sales Director, New Projects)*

The market analysis was elaborated by the other case interviewees, where they described that more systematic market research is conducted only occasionally, based on if there's a demand for one.

*“We have done market research and analysed some companies if needed, but not in a very systematic way. First, we of course define which area of the market we want to study and then we investigate that area, but this depends on the situation. So, no one process exists, but usually the analysis presents the past, the present and the future. It is not done perfectly or in a same manner every time and the results are not based on a formal structure. I usually will have the Sales Directors to conduct the analysis based on the scope and they do it how they see the best. But there should be a process where it would be done always in a same way” – C2, (Maritime CEO)*

*“Every other year I think we have done customer surveys and there has been an external consultant supporting us with them. Then in our business departments we have analysed [the results], but this has still been in more of a testing stage” – C3, (Sales Director, Services)*

Other issues related to market analysis included the hardship in reaching the correct people for the customer surveys and receiving responses. The current analysis methods also included a lot of mechanical stages with little to no automation, indicating the need for AI solutions. This was also recognized by the A5, IT CEO who had noticed these issues being a trend in many companies.

*“You can of course do the gathering of the information with very traditional methods, for example searching through the competitor or customer websites and you don't even have to use AI for that. But I think the manual crawling is something time shouldn't be spent on, but instead it should be automated, using LLMs. I've noticed that even large corporations still do it manually, but I think it is better to use services which do the crawling for you. For example, ChatGPT can give you quite fresh information and it makes it easy for you. The Open-AI model behind the ChatGPT can be used through an API-based solution so I think the traditional methods could be skipped and this is something that has changed over just the past few years.” – A5, (IT CEO)*

Main sources in addition to LinkedIn news, and surveys included sales prospecting tool, different databases for shipping and markets where more specific industry information is acquired.

*“We use a lot of different databases for gathering information. We also follow ship movements. One shipping database is also used for connecting information into our SaaS (Software as a Service) system” – C3, (Sales Director, Services)*

*“We use different news portals, classification reports, our partners around the globe and different shipping databases. We also use commercial registers.” – C2, (Maritime CEO)*

Current strengths were only seen from the perspective of being able to conduct the analysis in a flexible and fast manner from an operational point of level. The interviewee C1, Sales Director (New Projects) also felt that they can get fairly good data and information from an intuitive basis. In addition, the interviewee C3, Sales Director (Services) felt that the current process for surveying is already good if they could just reach the correct people.

The case interviews brought up the need for standardized, constant visualized market analysis with having multiple sources explained for the analysis and for the results. Some of the interviewees also highlighted the importance of interactivity, so that the results could be filtered.

*“Some kind of dashboard that could be filtered. We also have many systems where I would want to integrate [the market analysis] into. Be it the Enterprise Resource Planning (ERP), Customer Relationship Management system (CRM) or marketing systems. Also, the background of the information in the analysis should be uncovered, where the results are generated from with explanatory details.”* – C1, (Sales Director, New Projects)

*“Let’s just say, it needs to be clear, comprehensive and have analysis from different viewpoints. Because if you ask something from a one person, you get one perspective, and then other person gives a [different] one. So basically, a sample of different sources”* – C2, (Maritime CEO)

This chapter answers the research question RQ2: “How do firms transform market data into knowledge to support decision-making, with and without AI?” from the case study perspective, with focus included how this process could be enhanced. Based on the results, market analysis is currently conducted for making short term operational decisions to create more sales and to improve customer relationships with services. On a longer-term market analysis is used to drive the strategy and understanding in which direction the market developing to align product development with the evolving needs of the customers.

Market analysis is also currently conducted in a flexible and rather agile but unsystematic way based on the available sources. The results for market analysis purposes, how the case company currently transforms market data into results and AI’s potential in this domain are also presented in a form of a Gioia structure below.



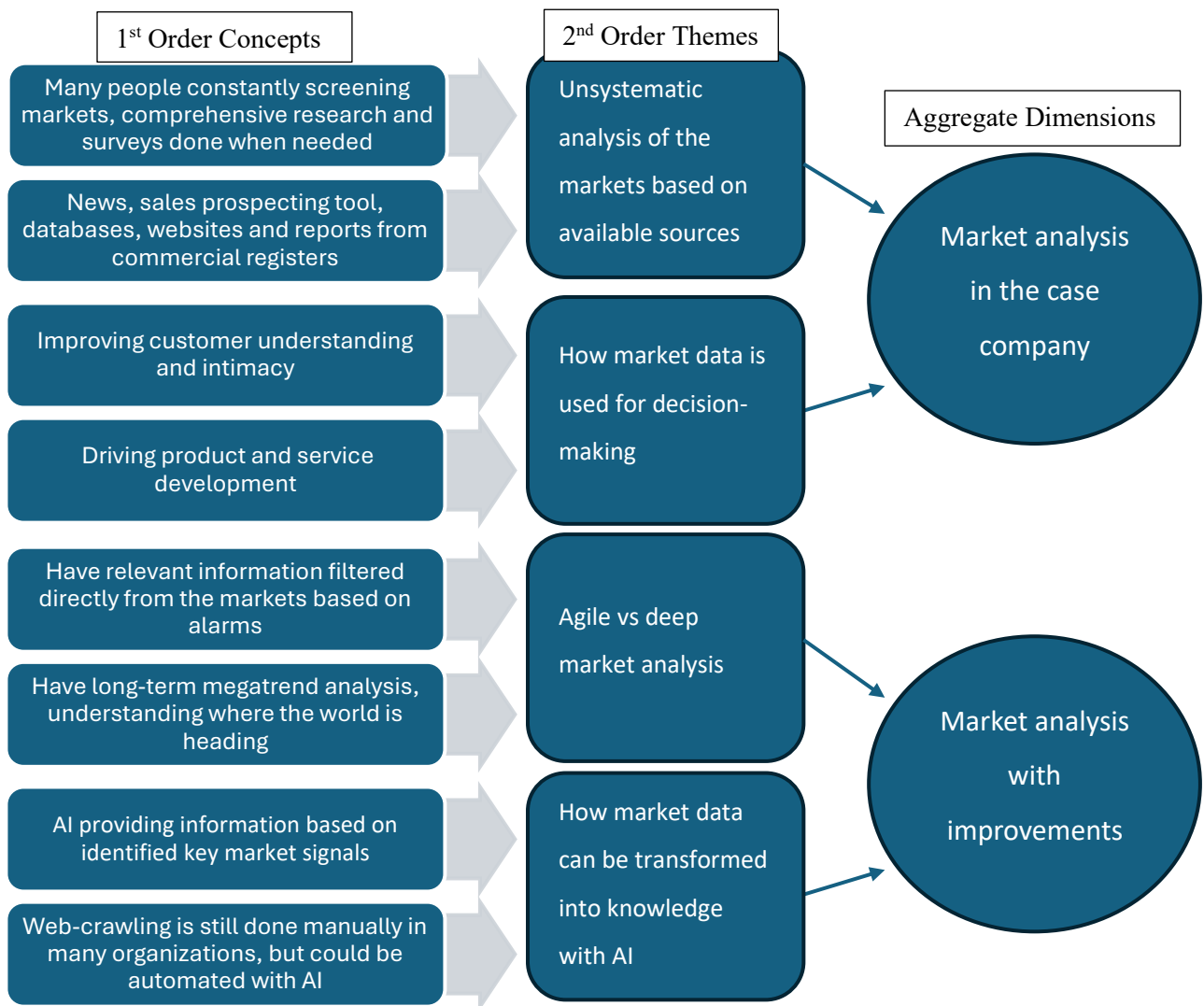


Figure 6. Gioia Structure: From traditional practices to AI-enhanced market analysis (RQ2 - Transformation)

### 5.3 Human–AI Collaboration

In the interviews it was also discussed how human–AI collaboration works in the best way, bringing in AI’s analytical capabilities together with the intuitive approach of humans. All the interviewees recognized this possibility, highlighting the benefits of AI in market analysis and decision-making.

*“I think if [AI] could be used in an easy and smart way to get comprehensive summaries that would be trustworthy. So basically, analysing large amounts of data from different perspectives, since that is something in which humans use a lot of time in.” – C2, (Maritime CEO)*

*“When we have a quite good hunch, that [intuition] could enrich the AI’s analysis quite well, understanding what kind of attitude markets have in different countries towards the future of green solutions. For example, if AI could calculate some kind of impact factors, we could connect our gut feeling into it. – C1, (Sales Director, New Projects)*

It was also emphasized that AI can help humans as an encyclopaedia for information retrieval. The human doesn't have to remember everything from memory, but it is enough to have some knowledge or hunch on a topic and AI can then provide the human with more detailed information.

*“One example [I can think of] is that there's a lot of rules for different classes and I wasn't entirely sure how [the rules] went in practice. So, I asked the AI, and it created quite good analysis of what was included in the class rules, which assured my memory. So, if you have a hunch on something but cannot quite remember all the details, then AI can remind you with the information.” – C3, (Sales Director, Services)*

The AI experts also shared their views on how human–AI collaboration can create synergy and contribute to market analysis, complementing the thoughts of interviewee C2, Maritime CEO mentioned earlier.

*“When you have enough data on customers' needs and competitor's situations, then [AI] can help to summarize that information and with innovative support on what should be done. The organization's own ideas can be enriched with a LLM, since it can tirelessly come up with new ideas, where the human can then pick the most potential ones.” – A5, (IT CEO)*

*“I've noticed that the generative AI-solutions help a lot within the idea phase, so when organization starts to plan what the next market is and where they are going to expand with what product. So basically, you have an AI-colleague who helps to brainstorm. This helps to think faster and have new perspectives more efficiently.” – A6, (Data & AI Research Manager)*

*“Nowadays you can externalize a lot of things to AI, but [having data processed into knowledge] is quite complex thing. You need to configurate it correctly and the human's role as the validator, teacher and expert is quite important, so that the [output] is not useless. I think the best way to do this is to have a GPT-based user interface, where your data can be integrated, and you can chat with the AI in an interactive way.” – A4, (Entrepreneur & Researcher)*

The human–AI collaboration was further described as a process by interviewee A4, Entrepreneur & Researcher, where human is brought to the loop and takes responsibility for the output created by AI. It was also discussed in the interviews, that how AI can complement human's expertise in decision-making situations.

*“I think it is an organisational process, so when the AI proposes something at what point does the human come into the loop to ensure that the suggestions made by AI based on certain data is correct? For example, AI can solve a lot of these master data problems, where the same thing is written in many ways. I think there are great possibilities within [that domain]. But the human is responsible for the AI's proposals. It is a new way to do data governance, and I think that it isn't yet on a level that's possible.” – A4, (Entrepreneur & Researcher)*

Human's role as the validator and teacher and AI's role as a supporting actor was also further emphasized by other interviewees. Interviewees also recognized some of the risks associated with AI use in different ways.

*"I think finding data and producing text are two clear cases, where generative AI creates value. They make working more efficient and can even create better quality [results] than what a person could do. It is just important to check the output and understand what the model is creating".* – A6, (Data & AI Research Manager)

*"For example, if AI does an email for you, it is usually 70 % correct and 30 % you need to manually change, and this applies to everything AI does. The AI is for sure getting better constantly, but [the human] will always have the teacher's role, where the user needs to choose to correct filters so that the AI knows what the user wants from it, so that it can fine down the parameters. There's the risk that the user doesn't know what they are doing and then AI can produce wrong data. This requires caution, since it is a risk that needs to be managed and solved."* – C1, (Sales Director, New Projects)

*"I think AI provides good support as the servant, but if it is the master then it is not a good thing. Human needs to estimate if the output is reasonable"* – C2, (Maritime CEO)

Only one interviewee C3, Sales Director (Services) brought up the idea, that AI could at some point be the key actor in the market analysis process but also recognized that one must be critical to its output.

*"I'm not entirely sure, but I think that [AI] could be a key actor [in the market analysis]. Data amounts are constantly increasing, while humans are quite limited in understanding it [the data] and creating analysis. AI can analyse large amounts of data fast and humans can never achieve the same time span in that. However, there's a risk that AI doesn't understand what [the human] wants and that requires criticality - understanding if the output is correct."* – C3, (Sales Director, Services)

It was also discussed further with the AI experts to which extent AI should be given power from the analysis and the decision-making perspective.

*"With this AI maturity and what the research also says is that humans should do the decisions, and AI can do the analysis, bringing in creativity and proposals."* – A4, (Entrepreneur & Researcher)

*"I think both AI and human should be always included. Neither alone is enough. I think this is a question of trust. If we know that an AI solution is correct 85 % of the time, then is that enough? What is the level that should be achieved, so that you can trust the AI? Currently I think AI can be trusted more in the analysis phase and less in decision-making. The most important thing is what trust level can we achieve. How often is AI correct and in which situations can we act based on it? But still I think, even though AI would be correct 99 % of the time, even then the output should be reviewed."* – A6, (Data & AI Research Manager)

The A5, IT CEO also brought up that in an ideal situation AI should be implemented as a natural part of the organisational processes, so that humans don't have to decide if to use AI or not.

*"I think the current model to which many firms have drifted is that LLMs, for example Co-Pilot is given to employees with the basis of "just use it in your work." This model is a natural step but should be outgrown fast. Since this depends completely on the individual's ability to use AI and is about individuals using AI, not the company. I think AI should be integrated as a natural part of [organisational] processes, so that employees don't individually have to decide whether to use AI or not. This way the value is created systematically and regardless of an individual employee. In the current model this puts employees in an unequal position, creating pressure for education and [produces] poor-quality results, since some use [AI] better than others. I think this is a transformation phase and more comprehensive software solutions should be used creating company level value instead of developing individual use based LLMs." – A5, (IT CEO)*

#### **5.4 AI Risks in Market Analysis and Mitigation Measures**

Expanding the discussion around the human–AI collaboration, where AI is the supporting actor and human is the validator, this chapter expands on the risks illustrated in the Chapter 5.3 but goes deeper into on how these could be solved. The interviewees brought up different kinds of risks, with A4, Entrepreneur & Researcher highlighting that the traditional AI risks don't really exist in the context of market analysis, while others emphasized many risks which are also dependant on the AI-type.

*"There are not many ethical risks since you are using open-source data for the analysis. There are no privacy related concerns, or nothing connected to people when we talk about the traditional risks of AI, so it is quite a safe bet. The usual AI problems are for example related to it doing a loan decision based on skin colour. These issues that are related to the AI act or GDPR, putting pressure on organisations do not exist in the case [of the market analysis]." – A4, (Entrepreneur & Researcher)*

*"There are risks, especially if LLMs are used. They can be manipulated and there's a risk of the AI learning false facts from false information input, including risk of hallucination. LLM's also don't produce repeatable results but can provide a different answer tomorrow compared today. If you have business processes integrated heavily to LLMs operating in a certain way, there's a real risk of having these processes not working. In this situation I would recommend having the AI as a supporting actor. Machine Learning is a different case, since it can be based on firm's own historical data, where you can calculate the probabilities of it operating correctly. So, ML has a better predictability, it can be also tuned better and controlled based on the needs. So, these two [LLMs and MLs] operate in a completely different way". – A5, (IT CEO)*

The requirement for transparency in AI systems was highlighted during the interviews, which was also understood in the case company.

*“It is very important to show what information is used in the analysis. You cannot trust the result if the system doesn’t have transparency of showing the references on which the output is based on. If this is the case, the user does not trust the result, having the value of the whole system lost. Some systems, especially ML neural networks support the explanation of the output.” – A5, (IT CEO)*

*“If for example an LLM produces something, it is always good to ask the data source for the output, since it is based on different [prompts] that produce summaries.” – C2, (Maritime CEO)*

It was further emphasized that the risks connected to AI use are not really related to AI as such but are part of basic practices regarding IT and data governance. This was also further emphasized by A5, IT CEO who brought up some very concrete risks related to LLMs.

*“Of course, if you connect your own information and create a hypothesis of a new product and start to gather silent signals supporting that, it is a different scenario, connected to information security and IT governance. In any situation that organisation does any kind of IT, they need to adopt the basic security practices and good IT practices that these follows.” – A4, (Entrepreneur & Researcher)*

*“Information security is a big thing related to AI. For example, the unlicensed version of ChatGPT takes the data to US, which means you cannot use it for things that should stay inside the EU. In other cases, people might accidentally insert confidential information in a form of a question, and it can end up in the learning mechanism of the LLM and be retrieved through it, which I know has happened. Also, for example if we connect Co-pilot to firm’s document system, dramatic information security problems can arise. AI can bring up confidential information and provide it to someone who shouldn’t see it and they don’t even know it, since they don’t know if the information is confidential or not. I think here the solution is to create an AI system, that tells the user if the information it provides is protected or not. Unfortunately, I think for example Co-pilot or ChatGPT doesn’t yet do this, but they should, and this is something organisations should be aware of.” – A5, (IT CEO)*

Other solutions connected to the use of AI were related to mandatory trainings, that without successfully completing, the users cannot use AI. The requirement for education and training was also addressed in the case company.

*“I think the ideal would be, that the use of AI solutions would require the completion of trainings, which include the risks involved in use of AI. This should be conducted [for example] every six months in a same way that other trainings are done, and this is part of the whole organisational security culture.” – A6, (Data & AI Research Manager)*

*“Training and awareness for the users’ needs to be conducted. The human must understand what they are doing when they use AI.” – C1, (Sales Director, New Projects)*

In conclusion many of the addressed risks support the importance of the human in the loop when utilizing AI. This was further elaborated by the AI experts.

*“There’s really no other way to make sure [of the safe use of AI] than having the human in the most important parts of the process and have the transparency, so that black-box issue can be avoided.” – A4, (Entrepreneur & Researcher)*

*“We still don’t really know how LLMs really work and there’s also a black box problem related to them. Sometimes they mask how they got the output. This just proves that the output always needs to be checked.” – A6, (Data & AI Research Manager)*

The results of the Chapters 5.3 “Human–AI collaboration” and 5.4 “AI risks in market analysis and mitigation measures” in this thesis provide crucial context for the case study while providing criticality towards the use of AI in the market analysis process.

## **5.5 From Data to Results: Utilizing AI in Market Analysis**

This chapter provides answers to the RQ3 “How can organizations utilize AI in market analysis to generate business value?”. The case company experts had a vision of what type of AI solution could be most useful for their role and for the company to have the best understanding of the market.

*“I think information security is important and that’s why Co-pilot is not very easy to use yet. It must be flexible in a way that you can upload different sources there easily. Now it [Co-pilot] requires you to load all sources through Microsoft cloud, which is slow and doesn’t always work. Instead, an easy-to-use tool which has information security in shape and so that the output could be verified” – C2, (Maritime CEO)*

*“Well, if I could wish it would be a comprehensive [AI] solution. We have a lot of systems in place, and it could provide support with all those systems. For example, Co-pilot is built in a way that you can use it in all Microsoft Office products. And for it [AI] to be effective, it needs to gather a lot of data from many different sources and connect it with our intuitive feeling or data we have gathered.” – C1, (Sales Director, New Projects)*

The C3, Sales Director for Services also had more customer-centric view on how AI could be used as part of the market analysis, deepening the customer understanding which is especially important in the services area.

*“I’ve been thinking about expanding the service support. If AI could provide 24/7 support to customers through a chatbot, it could save a lot of resources. In addition to this, analysis could be done based on what inquiries we get, who we get them from, so I think there are limitless opportunities for categorizing the customers. For example, if we have a new customer coming in, then the [AI] solutions based on the gathered statistics could tell us what this customer is looking for, are they interested in our products or services and are they going to buy from us or only hunting for prices. Creating customer profiles this way could help us to understand customer needs better. This is even more important to us than it is for the new projects, since there the customers have already made the decision to build a new ship, so their customers have a clear need to buy whereas in services, the customer needs vary a lot more.” – C3, (Sales Director, Services)*

The case company interviewees also further elaborated where they think AI could create the most value regarding the market analysis process.

*“I think AI [could create value] in gathering data, analysing the data, reporting, and forecasting trends. If we could have an AI solution or use AI in these [processes of market analysis] that’d be great. I think we could also increase the use of sales prospecting tool, where the user can pick the filters and AI then can provide the relevant data for us and do analysis to support the decision-making. In practice this would save a lot of time and decrease errors.” – C1, (Sales Director, New Projects)*

*“The gathering of data and forecasting [are the most important] and I can see the benefits of using AI for them, because now we are doing a lot of the [analysis] just based on gut feeling.” – C3, (Sales Director, Services)*

The characteristics of the case company were discussed with the AI experts, creating possible solutions for the use of AI in a market analysis.

*“In market analysis the data gathering is most time consuming for the individual and the LLMs are good in that. From a company perspective, the greatest benefit comes from forecasting, and I think that is already quite good with the current AI-solutions, which aren’t generative AIs. When we talk about secondary research - what is available on the net, AI makes that so much faster. It is just important to remember, that AI doesn’t do all the work. Also, the experts who know the subject gain the most value, since they know how to ask the right questions and recognize what information [is important] from a market analysis perspective.” – A6, (Data & AI Research Manager)*

*“I use the term unstructured information in which LLM-solutions are very good. They can utilize very scattered data sources. For example, if you use Open-AI’s solution, you can upload data into it, include context, ask information and it can connect these in a smart way, providing enrichment and cross-checking.” – A5, (IT CEO)*

In addition to the general information about turning data into results with LLMs, the AI experts provided their knowledge from real-life practical situations where AI has provided value. They brought up Retrieval-Augmented Generation (RAG) solution, which is based on an LLM and can be used in the market analysis perspective to connect company’s own data with external information.

*“For example, one firm that does optimising and is very AI-derived utilizes a user interface on top of their whole documentation system which is called Retrieval-Augmented Generation (RAG). This enables chat-based retrieval of information. Same kind of RAG-solution could be built for [market-analysis], providing safe-to-use LLM integrated to company’s documentation, enabling locally configured system that is interactive.” – A4, (Entrepreneur & Researcher)*

*“One company had a legacy-system, including all sorts of information from decades. It was difficult to use, and normal user had hard time to find any information [from it]. We created an LLM-based system for it, where the user could chat with the system and*

*it also retrieved the sources for the user, helping in decision-making and saving a lot of resources.” – A5, (IT CEO)*

The interviewee A6, Data & AI Research Manager also brought up some concrete solutions for AI-driven market analysis creating value, including the multi-use of different tools, doing sentiment analysis and providing information about silent signals through white space information.

*“Different uses have different tools. Same with ChatGPT and Co-pilot, they have different versions where one is better for coding, and one is for writing. I personally use both tools and compare the results. I’ve also heard a lot of good about Rider AI, which has provided good results in the analysis and research domain. We had an experiment, where one used the Rider AI, one used Co-pilot and one used Co-pilot’s agent solution. Then we compared the results of the different tools and made conclusions on which output was the best one.” – A6, (Data & AI Research Manager)*

*“Other example I can think of is Alphasense, which is not an AI-tool as such and it is used in the financial markets, but you can do AI-enabled sentiment analysis with it. It can analyse different tones of emotions on specific topics. The AI in it gathers analyst and expert views and creates a summary of what they think about specific topics. Even though it is not related to the maritime sector, I think the idea of connecting information from different sources and summarizing it is fascinating, and in some scenarios, it works very well. – A6, (Data & AI Research Manager)*

*“In my work I used to analyse what analysts, companies and consultants discussed on a specific topic. I tried to find nuances how their views differed. I used to do it quite manually, but generative AI can help a lot in providing “white space” information, which means what is not discussed about. I think the white space is related to silent signals and emerging trends and it [AI] works in that quite well.” – A6, (Data & AI Research Manager)*

It was also concluded in the case company interviews, that a lot of tacit knowledge already exists within the company regarding the market situation, but it wasn’t efficiently shared or utilized. The AI-experts concluded that knowledge base could be built for it.

*“One way to utilize tacit knowledge is to create knowledge base of the market situation, where individual employees’ findings would be updated to. I think in addition to this there must be alarm-based web scraping that would dig information and update the knowledge base with its findings and then you could use AI in top of that.” – A4, (Entrepreneur & Researcher)*

*“Information that is not public is harder to solve. If the data is not available, then even the AI cannot access it. But this is a domain where humans can help. The people who discuss with customers can gather the information of customer needs and then that information should be uploaded into a system, for example to a CRM. When this data accumulates to the system, you can use AI to do trend analysis, innovating where to invest or what services to develop and again LLMs are very good in that.” – A5, (IT CEO)*



Problems with building a basis for silent or tacit knowledge was addressed, and it connects to employee commitment and highlights importance of leadership and organizational culture, highlighting the Davenport et al. (2001) theoretical framework utilized in this thesis.

*“However, humans don’t always have the motivation to share the silent knowledge and there’s many reasons for that. It is not that the information is confidential, but because humans act as they do and some may think that their value is greater since they know, and others don’t.” – A5, (IT CEO)*

In addition, value of LLMs was also addressed by the A5 and A6 interviewees through democratizing the information availability to everyone, making less-experienced and less-technical employees more equal to the more experienced and technical employees.

### 5.5.1 From Data to Results: AI-enhanced Market Analysis Transforming Market Data into Business Value

This sub-chapter further creates ground for the RQ3 “How can organizations utilize AI in market analysis to generate business value?” providing the answers in form of a Gioia structure. Regarding how the AI-enhanced market analysis can generate value from the market data, the AI-interviewees emphasised the importance of linking the results the AI provides to the metrics and strategy that the firm utilizes. They also brought up that the value can sometimes be quite hard to quantify.

*“When you have metrics in the firm, then linking [the AI’s output] to those metrics—for example new high-potential customer leads and new product ideas. So, in the end it is about the effect that the AI has on the most important metrics, effect on strategy and making better decisions. So being very concrete and I think if it [the AI] doesn’t somehow contribute to the key metrics, then it is a bit questionable” – A4, (Entrepreneur & Researcher)*

*“It is quite hard, since I previously mentioned [regarding the legacy system] there can be information that cannot be accessed or utilized, and it is a hidden cost. No-one really knows how much bad decisions or investments are made, since if they would, those wouldn’t be done. Of course, we can calculate [the value] based on how much time individual saves with AI, but I think we should look these things from a broader perspective. Individuals doing their work a bit faster is good, but it doesn’t build competitiveness for the company. It’s more important to optimise on a broader level, but that’s hard since hidden costs aren’t recognized and therefore investments for AI are tough to justify and execute. Concrete numbers may be difficult to demonstrate, even though with AI new services or business could be created, that would not be possible otherwise.” – A5, (IT CEO)*

Although not directly related to market analysis, A5, IT CEO brought up a relevant example of how new business can be created with the support of AI, highlighting how data can be turned into

results, supporting the case company context, since they also manufacture physical products that data can be derived from.

*“I will refer to industrial companies since we work with them a lot. They usually manufacture physical products, with services created around them. All services nowadays are somehow digital. Data derived from the product can be used to proactively tell with AI when the product should be serviced. With that information customers can have their products serviced at the right time and not when they are needed for important projects” – A5, (IT CEO)*

Other interviewees brought up how AI can enhance the value of market analysis through the silent signals described earlier in this thesis.

*“I had discussions with an SME-company, and we thought about how to utilize the silent signals indicating demand forecasts based on construction projects and geopolitical signals. On that note I think the signals should be recognized which drive the actions when you have limited resources. For example, should we go to America or Asia, where do we invest? There are different services and alarms for the purpose, such as Google Alerts and Meltwater, where you define the filters, and you can use AI in the process. In the end we concluded that the best support for sales is using the open information with these kinds of alarms.” – A4, (Entrepreneur & Researcher)*

It was also brought up how defining Return on Investment (ROI) regarding AI can be challenging with possible solutions for measuring it, with a point also addressing what the A5, IT CEO addressed earlier about that the AI's value should be evaluated from a broader perspective.

*“What really is a good ROI [for measuring the value of AI in market analysis]? There's no single way to measure it. Simply put, if work becomes more efficient and quality increases then that is a clear benefit. However, in practice it isn't that simple. We used to do it first by gathering data, then investigating how [AI] solutions are used with it and after that we evaluate how [ROI] should be measured. One CEO in the news just said that when measuring the value of AI, in addition to measuring efficiency and quality, how well people adopt AI should be measured. I think that is a good point, since no matter what happens those who acquire and use it earlier will do better. The same thing happened with social media, those who took it seriously earlier could utilize it [better] in their business. Same applies to generative AI, so its adoption could be a metric itself that should be considered.” – A6, (Data & AI Research Manager)*

The interviews described in Chapters 5.5 “From Data to Results: Utilizing AI in Market Analysis” and 5.5.1 “From Data to Results: AI-enhanced Market Analysis Transforming Market Data into Business Value” describe directly how AI can be utilized in the market analysis process generating business value. This answers to the RQ3 by making data gathering more efficient, detecting relevant market signals more effectively and at earlier stage while providing business value through the enhanced market analysis with aligned metrics in place. The results of these chapters are also emphasized in a Gioia structure below.

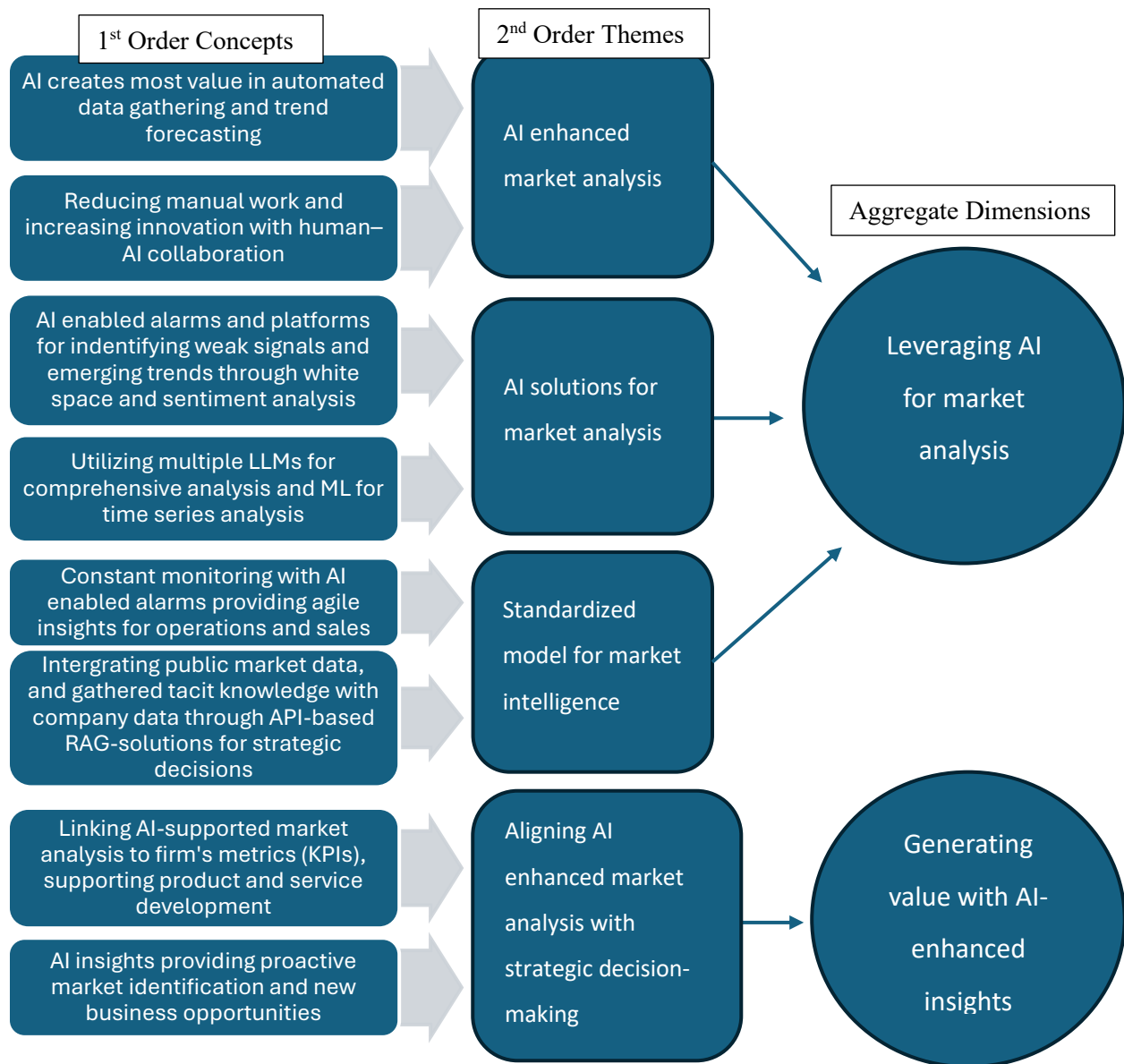


Figure 7. Gioia Structure: Utilizing AI in Market Analysis and Generating Business Value (RQ3 - Outcome)

### 5.5.2 Key Contribution: The Dual-Structured Model for Market Analysis

As the analysis of the interviews progressed, a consistent pattern emerged from both interview groups on how market analysis should be structured. Two distinct but complementary approaches were identified. One approach involves constant and fast monitoring of the markets to support operational agility, sales and customer insights with lighter AI tools. The other involves detailed reporting, which aims to provide a long-term and comprehensive view of the market with insights steering the strategical planning and the business.

The need for continuous monitoring was expressed by C1, Sales Director (New Projects), who mentioned monitoring system with alarms.

*“The amount of information is huge; how can you ever follow up all that? Basically, we would need a constant monitoring with good filters and alarms so that the relevant data would be introduced to us in an early enough stage and that we could do actions based on that data. It is hard and we don’t have time for that. So, if I think about my personal work, I would like the AI to filter me market data from LinkedIn and do me a short-term data of what customers are doing and what the news say. Then have this information constantly brought to us”* – C1, (Sales Director, New Projects)

This was also echoed individually by the AI experts, where monitoring was seen as having the greatest potential for the business. It was also something where artificial intelligence could provide extensive value, since the manual gathering of data from news and finding the relevant signals was considered the most time consuming and inefficient part if done manually.

*“I think the most complex thing is what’s the data that’s gathered and what are the relevant signals in it? If you can crack that then you have the greatest potential, since if you just succeed to find the correct data, then turning it into information becomes quite trivial. So, the most important thing is which [signals] are most important for your firm for a particular process? It is about finding diamonds in a haystack, and I think AI could greatly support within that domain. Since [the value created] is about the better you use the public market data available on the internet and connect the dots, having alerts that [constantly] deliver insights into your organization.”* – A4, (Entrepreneur & Researcher)

In addition, to the operational analysis with alarms, a deeper analysis with megatrends was also identified.

*“Another thing is seeing 10 years from now and having insights on what megatrends are happening in the markets. So, [in conclusion] what is happening now and what’s going to happen in the long run.” So, a quick reference and then also a broader view on what market actors say about the market situation and where shipbuilding is headed at. I think these could already be done and could create a lot of value to our decision-making”.* – C1, (Sales Director, New Projects)

The interviewee C2, Maritime CEO also described in the Chapter 5.2 “Strategical and Operational Purposes of Market Analysis” that the board-level decisions require a broader view of the market, including how the organization as a whole can be developed and how the sales could be enhanced. This highlights the purpose of the deeper analysis steering the strategical direction of the company but also how continuous monitoring can contribute to the agile decisions made regarding sales.

The interviewee C3, Sales Director (Services) also pointed out that they already have done customer surveys semi-annually, underscoring that a deeper, customer-including angle is utilized when conducting and reviewing strategic decisions.

*“When we get feedback from our customers, we can have an influence [based] on that and we have done it. For example, as the service complexity increases, we have done decisions based on that and our customers have confirmed that the direction that we are taking is the right one” – C3, (Sales Director, Services)*

The dual needs were observed across the interviewee groups. From the analysis of these discussion, this research derives a model that distinguishes between continuous monitoring, which is the operational layer, and deep analysis, which is the strategic layer. The operational layer supports agile signal-tracking for sales with lighter AI tools such as web scraping and automated alarms based on filters. The strategic layer in turn provides less frequent but regular deep dives, synthesizing market data with customer views, industry databases and tacit knowledge, which already exists within the company, but remains unstructured. This challenge can be solved with advanced AI-solutions, such as the Retrieval-Augmented generation (RAG) tools, which can be integrated into company systems, as described by the A5, IT CEO.

In summary, the dual-structured approach for market analysis offers significant benefits in the maritime context, where continuous signal-based monitoring and deeper strategic analysis function as complementary layers. This adheres to the different organizational needs, including operational agility and long-term foresight, together forming a consistent yet flexible market intelligence process.

This model creates a practical foundation for AI-enhanced market analysis practices, which can be implemented once the organizational requirements described in the Chapter 5.1 “Building Organizational Capabilities for Artificial Intelligence” are met. It also supports the delivery of business value by aligning both the operational and strategical objectives discussed in the Chapter 5.2 “Strategical and Operational Purposes of Market Analysis” and the Chapter 5.5. “From Data to Results: Utilizing AI in Market Analysis”. These findings reinforce the purpose of transforming market data into business value with AI-enhanced market intelligence solutions while underlining the organizational requirements for this process. These contributions are also discussed and highlighted in the next chapter, “6. Conclusions” of this thesis.

## 6 Conclusions

The key findings of this thesis are synthesized and reflected in this chapter. The findings provide both confirmation and extension to the previous research, offering novel insights from a case study-specific perspective. The structure of this chapter progresses from describing research questions, including the research gap then engaging in discussion with prior research and empirical findings, while underlining the possible limitations. Suggestions for further research are also described, where deeper research could provide additional value. The theoretical framework utilized in this thesis based on Davenport et al. (2001) also assisted in creating theoretical and practical contributions within the context of this case study.

### 6.1 Addressing the Research Questions

#### 6.1.1 RQ1: “How does the organizational context affect and enable the use of AI-enhanced market analysis?”

Organizational context is critical for successful implementation of artificial intelligence, since this transformation is not only a technological initiative, but is also dependent on organizational readiness and culture. While AI can provide significant benefits in enhancing the analytical processes, many firms still fail at successful deployment of technology. These barriers are related to organizational factors, including human aspects. Because of this, it is essential to examine how these contexts influence the adoption and effective use of AI in market analysis. This is particularly relevant in the maritime sector, where the decision-making often relies on intuition and experience.

As described, many organizations struggle to transform data into knowledge with barriers related data quality, accessibility and lack of clear processes. (Bigwood, 1997) Solutions for the use of AI in this domain are emphasized by Jarrahi et al. (2023) and Davenport (2018) who underline the importance of organizational culture, clear responsibilities and employee capabilities. Organizations that align their strategic goals, capabilities, processes, and technical infrastructures are more likely to successfully realize the benefits of AI. Since many AI investments have yielded limited results, sufficient attention to the human factors is also needed. (Jarrahi et al., 2023; Davenport, 2018)

Findings of this study confirm that leadership commitment, employee involvement and defined roles and responsibilities are decisive for a successful implementation of AI in market analysis practices. Interviewees emphasized the importance of organization’s lean-in attitude towards the use of AI, genuine executive commitment to data-driven decision-making, which both indicate that

instead of viewing this only as a technical practice, acquisition and deployment of AI should be a business-driven initiative. Additionally, the interviews underlined how AI should be gradually introduced with a defined purpose, considering external expertise when building AI capabilities from zero and ensuring the alignment of IT and business. Overall, the empirical research emphasized that organizational culture and strategic alignment affect the potential benefits and success of AI-enhanced market analysis in practice.

#### 6.1.2 RQ2: “How do firms transform market data into knowledge to support decision-making, with and without AI?”

In the context of data-rich but decision-constrained business environments, the transformation of market data into usable knowledge is critical for companies. While the availability of market data increases, the challenge is transforming the relevant data into knowledge that enables informed decision-making. This is especially crucial in complex and global industries such as the maritime sector, which are influenced by increasing regulation and technological shifts towards a greener future. The rise and acceleration of AI offers new possibilities to improve this transformation process. Simultaneously, organizations need to understand the requirements and limitations when deploying AI in the market analysis process.

Previous research highlights that traditionally firms are relying on human intuition, manual data collection and ad-hoc reporting practices when conducting market analysis. Useful analysis requires generating or gathering the data in a correct way that adheres to the needs of the analysis. (Fleisher & Bensoussan, 2015; Price et al., 2015; Vorhies & Morgan, 2005) While the traditional methods provide value, they are limited by the scope, efficiency, and subjectivity of human-driven analysis. Recent studies emphasize the AI’s potential in real-time filtering, recognizing patterns and anticipating trends. (Agu et al., 2024; Keding & Meissner, 2021; Mustak et al., 2021; Hamid & Iqbal, 2004) However, challenges exist in effective use of AI, including reliability of the outputs and the AI operating through a black box. These can currently be mitigated through human–AI collaboration. (Moradi & Dass, 2022; Jarrahi, 2018)

It was described in the interviews that the case company currently conducts market analysis in unsystematically and on an ad-hoc basis, with transforming data into knowledge in an agile but not very efficient manner. This transformation process still relies heavily on human interpretation, which is in accordance with previous research. A key empirical finding is the identification of a two-model approach to market analysis. This structure has two complementary components, continuous monitoring, and deep analysis. The constant tracking of markets aims to elevate sales

with AI tools allowing the real-time detection of weak signals and market shifts. Deep analysis is conducted periodically and supports major strategic decisions and steers the business direction through richer data synthesis. This practical framework for transforming market data into knowledge was not explicitly found in previous research and contributes to a new way on how firms balance operational agility with strategic depth in decision-making. Therefore, these findings extend the existing scholarly by illustrating how AI can be integrated into distinct levels for the data to results transformation process, depending on the goal, data availability and organizational readiness.

### 6.1.3 RQ3: “How can organizations utilize AI in market analysis to generate business value?”

Since market analysis has a significant role for companies’ decision-making and creating new business, implementing AI to this process has an immense potential to improve the operational and strategical capabilities on a significant level. It is also important to demonstrate the value of any investment, including the use of AI in the market analysis process. This means that AI is not just a technological experiment, but a value creating instrument adhering to the organizations business goals, providing results. Minimal research has been conducted on this topic, specifically in the context of industries such as the maritime sector which this case study addresses to.

AI can be utilized in market analysis to enhance data collection, analysing data from various sources, finding silent signals that humans might miss. LLMs help with summarizing large amounts of unstructured data with a clear added value. (Agu et al., 2024; Taherdoost & Madanchian, 2023) AI is better at handling complexity whereas humans execute decisions with intuitive understanding. (Jarrahi, 2018). However, AI-based performance improvements and results are only possible if organizational capabilities are aligned with business processes, strategy and culture. It was also emphasized that the metrics, including KPIs should be utilized to benchmark the effectiveness of the market analysis. (Van Looy & Shafagatova, 2016; Melnyk et al., 2004)

According to the empirical results, AI can support continuous market analysis with automated scraping, filtering, AI-enabled alarm tools and sentiment analysis of market data, whereas deeper analysis can be enhanced with AI providing insights to emerging trends and anticipating the future developments. The deeper analysis can be supported with RAG-solutions built on a tacit knowledge base and company systems with enterprise AI tools, such as ML for time series analysis and multiple LLMs for comparing results. In addition to the above-mentioned possibilities, business value can be generated through improved work efficiency, better customer understanding and enhanced decision-making. However, it is important to connect the market analysis results created



with AI to the organization's strategical and operational goals, such as market expansions, product development, new customer leads and enriched customer satisfaction. Providing contribution to these allows deriving value from the AI-enhanced market analysis processes.

## **6.2 Presentation of the Main Empirical Results, Including Discussion**

The empirical findings gathered and analysed in this case study provide extensive perspective on how artificial intelligence can be used in transforming market data into actionable knowledge and business value. These are complemented with attention to the organizational factors that affect the successful deployment of AI in market analysis. As the previous literature in the Chapter 2 describes many benefits, barriers and practical applications of AI, the empirical evidence from the case study provides several insights that both confirm and expand the existing research.

Essentially, many of the findings align closely with previous research. The case study data is consistent with Jarrahi et al. (2023) and Davenport (2018) research describing the importance of organizational activities, such as leadership commitment, clear responsibilities and company culture as the key enablers for successful adoption of AI in market analysis. The empirical data confirms that without strategic alignment and data-oriented organizational culture, firms struggle to realize the full potential of AI. The interviewees also underlined same challenges identified in the previous literature, such as the black-box problem and output reliability, supporting Moradi & Dass (2022) and Keding & Meissner's (2021) conclusions. As an expected result according to the empirical evidence, these can only be mitigated through human–AI collaboration, where AI operates as a supporting actor and humans are in charge of decisions with their intuitive judgement. This is in line with Jarrahi (2018), describing that AI should be utilized as a tool in a safe and governed way while providing value.

Also aligning with previous research is how market analysis results are utilized as a “shared belief” within the company, since formal and defined processes are missing or underdeveloped. The intuitive use of market information indicates that tacit knowledge still has a strong role in industrial companies, which was also addressed by Munim et al. (2020) in the context of the maritime sector. This was expected since many maritime companies are operating in very traditional ways even though their technical capabilities are high. However, this research provided an important nuance to this which was not expected and wasn't represented in the previous literature. According to the case interviewees, much of the operational analysis was reliant on informal and self-motivated gathering of market information done by individuals, even during personal time. This highlights a strong cultural devotion, which supports Davenport's (2018)

findings underlining the importance of organizational culture. However, it also shows that the current process is inefficient providing a clear need to structure the market analysis process and an opportunity for the use of AI in the market analysis.

In addition, several other anticipated results identified in previous research were underrepresented or completely missing in the empirical findings. For example, where the previous research such as Davenport (2018) highlight technological infrastructure as a decisive factor, the interviewees did not highlight this as critically, but described that successful AI adoption is more related to organizational and human engagement, rather than a direct technical matters. This suggests that technological barriers compared to organizational elements may be less significant than described in the previous research. Regarding technological aspects, the AI experts just pointed out that external support should be considered and in any case a firm does anything related to IT, the basics should be in order.

Also contradicting, the maritime industry was portrayed as a conservative and resistant to changes by the previous literature, whereas this study provided a nuanced perspective. As described earlier, the case company had a strong cultural devotion through self-motivated gathering of market data. Something that wasn't mentioned by the previous literature, but was in line with this organizational devotion was that the case study participants displayed considerable openness towards the use of AI solutions in the market analysis domain. The case company interviewees had a clear vision on what the benefits of AI could be, and they were interested in utilizing it. This level of openness was unexpected and highlighted alignment with the requirements that the AI experts and the previous research described regarding the importance of organizational commitment. Since the organizational market analysis and AI processes were lacking, once a plan for AI adoption in market analysis has been defined, external support and dedicated team inside the organization interested in data and AI solutions can start to drive this transformation as described by the AI experts.

New contribution provided by this study was that market analysis can be divided into two distinct layers, where the first one is continuous AI-supported monitoring including alerts on relevant data and news from open sources. The other involves deep-dive analysis that steers the Research and Development (R&D) for products and the organizational strategy with AI serving as a supporting actor, while human is the decision maker. This role configuration supported by the interviewees is in accordance with Jarrahi (2018) findings.

The divide of two distinct levels is a novel finding, not addressed by the prior research. Interestingly, this dual-structured approach to market analysis was individually addressed by both interview groups, the case company experts, and the AI experts. Solution for utilizing AI in the dual-structured market analysis was deploying AI-based alarm-tools for constant screening of news and building more advanced AI-solutions, such as RAG integrated to company systems for deeper analysis. The first solution of alarms and web crawling can be quite easily solved with the AI-enhanced prospecting solutions and LLM-tools intended for enterprise-use. For the solutions regarding deeper analysis, external help should be considered from IT/AI firms or consultants, especially when building analytical capabilities and RAG-solutions from zero.

<b>Dual Model Market Analysis</b>	<b>Continuous Monitoring (Operational Layer)</b>	<b>Deep Analysis (Strategical Layer)</b>
Goal	Being alert to market changes in real time, steering operative decisions	Supports long-term planning and innovation, steering the business and R&D
Sources	Industry news, customers and competitors, silent signals	Industry databases, customer surveys, tacit knowledge base
Improves	Operations and sales with automated monitoring	Strategy and business as a whole with better products and more informed strategical decisions
AI tools	Web-Scraping, inc. enterprise LLMs + alarm tools	API-based RAG-solutions and enterprise LLMs
Requirements	Align KPIs with the AI-enhanced market analysis Build knowledge base from tacit knowledge Consider external support when building AI capabilities	

Table 2. The Dual-Structured Model to Market Analysis

Lastly, an important topic discussed with the interviewees, also highlighted by previous research, was risk management activities and security practices. Use of AI tools includes risks, which needs to be reviewed and assessed. Solutions described by the AI experts included basics of IT security practices, including data governance and a detailed handbook of how AI should be utilized. One of the AI experts noted that market analysis is usually an external process, which removes the traditional AI risks, which was something that previous research as such didn't explicitly mention. Others brought up that many of the risks such as black-boxes and hallucinations associated with AI

are included. In this context, the role of humans as verifiers and decision-makers was emphasized by all interviewees, a configuration also supported by previous research.

### 6.2.1 Limitations and Suggestions for Future Research

The findings provide a deep insight into the topic of this thesis: “The Role of Artificial Intelligence in Market Analysis”. However, since this research is based on a single-case study, it may limit its generalizability. For increased transferability, future research could involve conducting a multiple-case study for different firms either within the maritime sector or other industries. In addition to qualitative research, quantitative methods could be used to examine correlations and potential causality between AI use in market analysis and business performance metrics. Within the scope of this case study, a follow-up study could also be conducted for the case company addressed once AI has been implemented for market analysis to assess its practical effectiveness in this specific context.

### 6.2.2 Contributions to Practice

This study provides practical insights into how AI can be utilized in the context of market analysis, offering a practical framework for implementing AI into market analysis practices. These insights are particularly relevant for maritime companies aiming to build their analytical and organizational capabilities to unlock business value through AI-enhanced market intelligence functions.

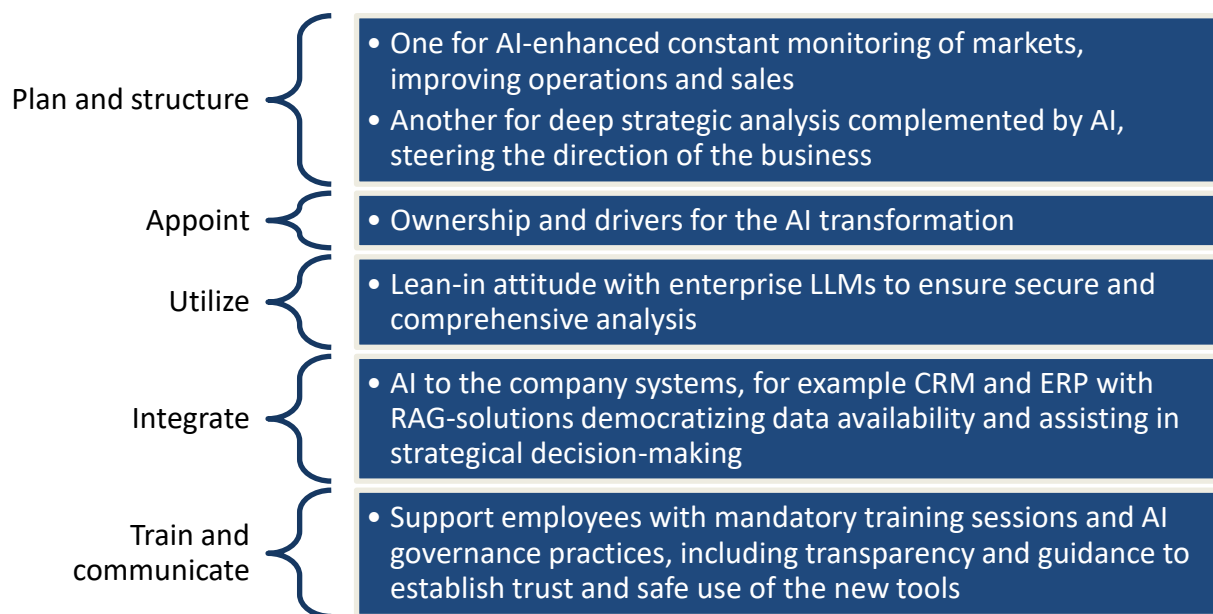


Figure 8. The AI-enhanced Market Analysis Implementation Framework

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# Appendices

## Appendix 1. Semi-Structured Interview Guide - Case Company Experts

### 1. Background Questions - Case Company Experts

- 1.1 Can you briefly describe your role in the company?
- 1.2 What is your job title?
- 1.3 How long have you worked at the company?
- 1.4 How long have you been in your current position?
- 1.5 How is your work related to market information?
- 1.6 How is market analysis currently conducted in the company?
- 1.7 In your opinion, what are the three most critical decision-making areas where market data is used?
- 1.8 How do you currently use AI in your work?

### 2. Market Data Collection and Management - Case Company Experts (Davenport et al., 2001: Data Management & Infrastructure)

- 2.1 What data sources do you use for market analysis?
- 2.2 How often is market data updated and how is it stored?
- 2.3 What are the biggest challenges in collecting and managing market data?
- 2.4 Are you currently using any automatic tools or analytics for data management?

### 3. Analysis Process and Decision Support - Case Company Experts (Davenport et al., 2001: Analytical Processes & Decision Support)

- 3.1 What is a typical market analysis process in the company?
- 3.2 What are the main stages?
- 3.3 Who is responsible for which phases?
- 3.4 What are the strengths of the current process?
- 3.5 What are the weaknesses of the current process?
- 3.6 What kind of market analysis process would work best in the company?
- 3.7 What is your opinion on how market insights should be produced in the future to support your area of responsibility in the best way or the company as a whole?
- 3.8 How should market information be presented to decision-makers to best support decision-making?
- 3.9 What kind of metrics are used in decision-making that market data supports?
- 3.10 How are decisions made between different options (for example opportunity costs), and how does market data support this?
- 3.11 How does market analysis and decision-making link to company strategy?

### 4. Opportunities of AI and Automation - Case Company Experts (Davenport et al., 2001: Analytics and Decision Support, Huang & Rust, 2021: A strategic framework for artificial intelligence in marketing, Jarrahi et al., 2023: Partnership between human and AI)

- 4.1 Has AI already been used in any way in market analysis?
- 4.2 If so, what insights or benefits have been gained?
- 4.3 In which areas could AI provide the most value? (e.g. data collection, analysis, reporting, anticipating trends, forecasting?)
- 4.4 What risks or challenges do you see in deploying AI in market analysis?
- 4.5 How do you see the role division between AI and humans in market data analysis— providing supporting, or could it play a central part in decision-making?
- 4.6 Transparency and responsibility are critical in human-AI collaboration. How would you ensure that AI-generated information and decisions are properly understood?
- 4.7 Literature suggests AI can complement human intuition and decision-making. In what situations would this be most useful for the company?
- 4.8 What kind of AI solution would best support your work and the company's market understanding?

## **5. Development Ideas and Expectations for the Future - Case Company Experts**

- 5.1 What kinds of AI solutions would you like to see in the future to improve market analysis?
- 5.2 What kind of expectations or needs the company has regarding the use of AI in support of market analysis?

## **Appendix 2. Semi-Structured Interview Guide - AI experts**

### **6. Background Questions - AI experts**

- 6.1 Could you briefly describe your current role or expertise?
- 6.2 What is your job title?
- 6.3 How long have you worked in the context of data, AI, or knowledge management?
- 6.4 Have you been involved in projects where AI has been used in market research, business analytics, or similar contexts?

### **7. Data Management and Organizational Capabilities - AI experts (Davenport et al., 2001: Data Management & Infrastructure, Jarrahi et al., 2023: Partnership between human and AI)**

- 7.1 What factors should an organization have in place to effectively use AI in market data analysis or research?
- 7.2 How is market or business data typically collected and managed in AI-enhanced solutions?
- 7.3 What are the most common challenges in data collection, quality, or management, especially in business environments?
- 7.4 How can AI support or enhance data processing, synthesizing, and transformation?

### **8. Analysis Process and Decision Support - AI experts (Davenport et al., 2001: Analytical Processes & Decision Support)**

- 8.1 In which areas of market analysis do you think AI could provide the most value? (e.g. data collection, analysis, reporting, trend anticipation, forecasting?)
- 8.2 How can AI be used to turn data into insights and usable knowledge (e.g. trend detection, recommendations)?
- 8.3 What types of AI solutions (e.g. machine learning, neural networks, language models) are particularly useful for supporting business decisions?
- 8.4 In what situations can AI complement human expertise in decision-making?
- 8.5 How can AI-generated insights be presented in a way that supports decision-making?
- 8.6 Could you provide examples where AI has improved the efficiency or quality of decision-making?

### **9. AI Implementation and Business Value - AI experts (Davenport et al., 2001: Analytics and Decision Support, Huang & Rust, 2021: A strategic framework for artificial intelligence in marketing, Jarrahi et al., 2023: Partnership between human and AI)**

- 9.1 What are the most common barriers or obstacles in AI deployment?
- 9.2 How should roles and responsibilities between AI and humans be divided in analysis or decision-making?
- 9.3 How does AI adoption affect organizational practices and the decision-making culture?
- 9.4 Do you know any concrete AI-solutions (e.g. tools or technologies), that suit well anticipating and understanding the markets especially in a B2B-environment?
- 9.5 How can AI help in assembling scattered data so that it provides value for the business or to the executives?
- 9.6 How can an organization demonstrate or measure the business value of AI-enhanced market analysis?
- 9.7 What kind of new business opportunities could AI provide based on market data?
- 9.8 How can AI help identify weak signals or emerging trends that humans might not notice?
- 9.9 How could these potential weak or silent signals be utilized in business planning?

### **10. Risks, Ethics, and Future Outlook- AI experts (Jarrahi et al., 2023: Partnership between human and AI)**

- 10.1 What risks or challenges do you see in using AI for market or business data analysis?
- 10.2 How can the information security of the organization and individuals be ensured when utilizing artificial intelligence?
- 10.3 How can it be ensured that AI-generated recommendations and conclusions are correctly understood and ethically acceptable?
- 10.4 How do you see AI's role evolving in business analytics or market research over the next 5-10 years?

#### 11. Summary - AI experts

- 11.1 If an organization is starting from scratch, how would you recommend building AI capabilities for leveraging market intelligence?
- 11.2 Is there anything we haven't covered that you consider important from the perspective of AI and market analysis?

#### Appendix 1 and 2 References:

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## Appendix 3. Research Data Management Plan

### Research data

Research data type	Contains personal details/information*	I will gather/produce the data myself	Someone else has gathered/produced the data	Other notes
Data type 1: <i>Interviews</i>	x*	x		*The original data contains personal details but is anonymised for the analysis and thesis.

\* Personal details/information are all information based on which a person can be identified directly or indirectly, for example by connecting a specific piece of data to another, which makes identification possible. For more information about what data is considered personal go to the [Office of the Finnish Data Protection Ombudsman's website](#)

## **Processing personal data in research**

I will prepare a Data Protection Notice\*\* and give it to the research participants before collecting data ☐

The controller\*\* for the personal details is the student themselves ☒ the university ☐

My data does not contain any personal data\* ☒

## **Permissions and rights related to the use of data**

### **Self-collected data**

Data type 1: Recording of the interviews. Permissions are acquired through email and confirmed before starting the recording of the interviews with the interviewees. The results will be anonymised.

## **Storing the data during the research process**

Where will you store your data during the research process?

In the university's network drive ☒

In the university-provided Seafile Cloud Service ☐

Other location, please specify: In the Case Study company's SharePoint, to my personal folder, as backup to personal iPhone, but that is deleted once thesis is ready at latest during the summer of 2025. Anonymised data is also stored in my Google Drive folder. ☒

## **Documenting the data and metadata**

### **Data documentation**

Can you describe what has happened to your research data during the research process? Data documentation is essential when you try to track any changes made to the data.

To document the data, I will use:

A field/research journal ☐

A separate document where I will record the main points of the data, such as changes made, phases of analysis, and significance of variables ☐

A readme file linked to the data that describes the main points of the data ☐

Other, please specify: ☒

I have saved different versions of the data, starting from the original data which is to be deleted once the study is published in summer 2025, including the transcribed, anonymised and analysed versions of the data, providing insights into the data documentation process.

### **Data arrangement and integrity**

How will you keep your data in order and intact, as well as prevent any accidental changes to it?

I will keep the original data files separate from the data I am using in the research process, so that I can always revert to the original, if need be. ☒

Version control: I will plan before starting the research how I will name the different data versions, and I will adhere to the plan consistently. ☒

I recognise the life span of the data from the beginning of the research and am already prepared for situations, where the data can alter unnoticed, for example while recording, transcribing, downloading, or in data conversions from one file format to another, etc. ☒

### **Metadata**

Metadata is a description of your research data. Based on metadata someone unfamiliar with your data will understand what it consists of. Metadata should include, among others, the file name, location, file size, and information about the producer of the data. Will you require metadata?

I will save my data into an archive or a repository that will take care of the metadata for me. ☐

I will have to create the metadata myself, because the archive/repository where I am uploading the data requires it. ☐

I will not store my data into a public archive/repository, and therefore I will not need to create any metadata. ☒

### **Data after completing the research**

You are responsible for the data even after the research process has ended. Make sure you will handle the data according to the agreements you have made. The university recommends a general retention period of five (5) years, with an exception for medical research data, where the retention period is 15 years. Personal data can only be stored as long as it is necessary. If you have agreed to destroy the data after a set time period, you are responsible for destroying the data, even if you no longer are a student at the university. Likewise, when using the university's online storage services, destroying the data is your responsibility. What happens to your research data, when the research is completed?

I will destroy part of the data, but store part of it for 5 years, because:

I will destroy all original personal data once I have gathered the data and analysed it in the thesis but keep the anonymised version for five years according to University's retention period in Case Company SharePoint, my personal UTU-network drive and my personal PC.

If you will store the data, please identify where:

I will store the data with personal information within Case Company personal SharePoint folder, my personal UTU-network drive and my in personal iPhone as backup but that is just until the thesis is ready at latest during the summer of 2025. After that all data including personal information will be deleted.