REDUNIQ - From Insights to Action:
Unlocking the Potential of Retail Analytics for a payment solution provider

Kathrin Göbel | 152121286

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ABSTRACT

In today's dynamic retail landscape, data-driven decision-making is transforming the industry (Dekimpe, 2020). This study investigates the impact of data utilization in the retail sector, with the example of REDUNIQ Insights—a tailored data analytics solution for Portuguese retailers. Through qualitative interviews with REDUNIQ Insights clients, industry experts, and practitioners, this study explores the challenges and opportunities posed by the adoption of retail analytics. This research reveals that while retailers acknowledge the value of data, they encounter challenges in maximizing its potential. Challenges include data overload, unclear use cases, and limited data analysis capabilities. REDUNIQ Insights emerges as a enabler, empowering retailers to make informed decisions, comprehend consumer behavior, assess economic impacts, and optimize operations. To enhance REDUNIQ Insights' value proposition, the study offers recommendations, including the development of more segmented reports, improved cost-benefit ratios, assistance in identifying suitable use cases, investments in data analysis capabilities, while also highlighting the potential for adopting data analytics in the retail sector. Establishing an ongoing feedback loop with users is pivotal for maintaining the relevance of REDUNIQ Insights. As retailers navigate the complexities of the modern market, data-driven decision-making, supported by solutions like REDUNIQ Insights, stands as a driving force shaping the industry's future. This research deepens the understanding of the challenges and opportunities associated with retail analytics, providing practical insights for companies seeking a competitive edge in the data-driven era.

Title: REDUNIQ - From Insights to Action: Unlocking the Potential of Retail Analytics for a payment solution provider

Author: Kathrin Göbel

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ABSTRATO

No cenário de varejo dinâmico de hoje, a tomada de decisões baseada em dados está transformando a indústria (Dekimpe, 2020). Este estudo investiga o impacto da utilização de dados no setor de varejo, com foco em REDUNIQ Insights - uma solução personalizada de análise de dados para varejistas portugueses. Através de entrevistas qualitativas com clientes do REDUNIQ Insights, especialistas da indústria e profissionais, este estudo explora os desafios e oportunidades decorrentes da adoção de análises de varejo. Esta pesquisa revela que, embora os varejistas reconheçam o valor dos dados, eles enfrentam desafios para maximizar seu potencial. Os desafios incluem sobrecarga de dados, casos de uso pouco claros e capacidades limitadas de análise de dados. O REDUNIQ Insights surge como um facilitador-chave, capacitando os varejistas a tomar decisões informadas, compreender o comportamento do consumidor, avaliar os impactos econômicos e otimizar as operações. Para aprimorar a proposta de valor do REDUNIQ Insights, o estudo oferece recomendações, incluindo o desenvolvimento de relatórios mais segmentados, melhoria das relações custo-benefício, assistência na identificação de casos de uso adequados, investimentos em capacidades de análise de dados, destacando também o potencial de adoção de análises de dados no setor de varejo. À medida que os varejistas enfrentam desafios no mercado atual, a análise de dados, com soluções como o REDUNIQ Insights, molda o futuro da indústria. Esta pesquisa aprofunda a compreensão dos desafios e oportunidades associados à análise de varejo, fornecendo insights práticos para empresas que buscam uma vantagem competitiva na era baseada em dados.

Título: REDUNIQ - De Insights para Ação: Desvendando o Potencial da Análise de Varejo para um Provedor de Soluções de Pagamento

Autor: Kathrin Göbel

Palavras-chave: *Análise de Varejo, Tomada de Decisão Baseada em Dados, Indústria de Varejo, Utilização de Dados*

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KPI	Key Performance Indicator
SMB	Small and Medium Sized Business
USP	Unique Sellin Point

1 Introduction

1.1 Background

The global retail industry has undergone significant changes in recent years, driven by the increasing adoption of digital technologies and changing consumer behavior (Krymov, 2019). The COVID-19 pandemic has accelerated the need for retailers to adapt quickly to shifting market conditions even further (McKinsey, 2022; Nealon, 2021). It is estimated that the pandemic has accelerated digital adoption among customers by as much as five years (Accenture, 2022). To remain competitive and meet evolving customer demands, retailers must successfully leverage the power of data analytics to gain insights into their operations, customers, and supply chains. According to the McKinsey Global Institute, merchants who adopt big data might see an improvement in operating profit of more than 60% (MKGI, 2011). However, data analytics is still in the early stages of adoption, with retailers lacking technology knowledge, budget priority, and a data-driven culture (Fisher & Raman, 2018; Lorente et al., 2021).

In Portugal, the retail industry is essential to the country's economy, with a significant share of employment and a high proportional GDP of 450.4 billion € in 2021 (Global Data, 2022). Big Data and digital adoption have become increasingly important, with Portugal prioritizing strategies to boost Portuguese companies' digital and economic competitiveness (Estrutura de Missão Portugal Digital, 2022). However, many retailers still rely on traditional data analysis methods and struggle to keep up with the rapidly evolving landscape and providing enough analytical capabilities (McKinsey, 2022). This situation presents an opportunity for retailers in Portugal to embrace new technologies and data analytics platforms to gain a competitive advantage (Global Data, 2022).

REDUNIQ, one of the largest payment solution providers in Portugal, has also taken advantage of this new potential revenue stream and has built the data knowledge solution REDUNIQ Insights for its customer network, which allows it to share and sell valuable transaction data (UNICRE, 2023). To provide the best possible data insight solution for its clients, it is crucial to understand the value the data can yield for retailers and how it helps them to make better data-based decisions.

By assessing the possible influence of data utilization on retailers' operations and performance, this study aims to provide actionable insights for data providers and retailers, using REDUNIQ Insights as an example. This study examines the capabilities and the value offered by REDUNIQ Insights and suggests possible improvements. It also addresses the challenges and opportunities of adopting data analytics in the Portuguese and European retail sector.

1.1.1 Relevance

The retail industry is facing a growing need for data analytics. It is confronted with intense competition, evolving customer preferences, and the requirement to remain flexible and responsive to market changes (McKinsey, 2022). In recent years, retail analytics has emerged as a critical tool for retailers to gain insights into customer behavior and uncover new business opportunities (Deloitte, 2019). Moreover, the COVID-19 pandemic has further accelerated the significance of data analytics in retail, as businesses have had to adapt quickly to consumer behavior and demand (Sides & Skelly, 2021). The potential benefits of retail data analytics are vast, including improving customer targeting and personalization, optimizing inventory management and supply chain operations, and identifying new business opportunities and revenue streams (McKinsey 2022; Rodriguez, 2023;). However, this does not only include internal data.

The pandemic also highlighted the importance of external data for retailers and companies are increasingly accessing external data (Aktas & Meng; Fisher & Raman, 2018). Consumer behavior changed rapidly, rendering existing internal data and predictive models ineffective. External data proved invaluable in understanding and responding to these changes (McKinsey, 2021). However, implementing internal and external data in the retail sector poses significant challenges and risks (Dekimpe, 2020; Lorente et al., 2021). After a study by Deloitte (2019), more than 50% of retailers need help finding the right talent and investing in data skills. Barriers for a sufficient data utilization are data quality, privacy, and security concerns, which can lead to reputational and financial harm if not appropriately addressed (Lorent et al., 2021).

Therefore, there is a growing need for research and analysis to help retailers navigate these challenges and effectively leverage data analytics to drive their growth and innovation in the retail industry. By addressing these issues, retailers can gain a competitive advantage and create

new opportunities to enhance customer satisfaction and drive business success (Chandramana, 2017).

1.1.2 Problem Statement

The amount of data that companies now gather doubles every 1.2 years (Shankar, 2019). As more transactions are conducted digitally, retailers have access to vast amounts of data about their customers' behavior, preferences, and insights into broader trends in the marketplace (Fisher & Raman, 2018). Especially digital and physical transactions generate huge quantities of data on consumer behavior and broader market trends that can be used in the form of business decisions. However, retailers face challenges in analyzing and interpreting high-volume data, which can be complex and daunting (Lekhwar et al. 2019; Shankar et al., 2019).

To address this issue, data insight solutions such as REDUNIQ Insights have emerged as essential tools for retailers to gain more insights into the market and their consumers. REDUNIQ was launched along with REDUNIQ Insights in 2020 with their vision: *"We connect People, Companies, and Technology, providing unique payment experiences"* (Unicre, 2023) REDUNIQ operates solely in the Portuguese market, accounting for over 50% of all transactions and holding a market share of 65%. With their network consisting of over 57,000 merchants, REDUNIQ has positioned itself as the leading card acceptance network in Portugal, (Unicre, 2023).

REDUNIQ Insights offers customized reports, which focus on *consumer information*, *including sales performance in value*, *number of transactions*, and *consumer profiles* from various sectors (Appendix A3). They use Power BI, a powerful data tool from Microsoft, to visualize the data they collect from their systems. For more details, the interface can be seen in Appendix A1 and Appendix 2. To analyze their data, REDUNIQ has a specialized analytics team responsible for customizing the reports. The reports provide an in-depth examination of the trends and changes occurring in various industries and regions during key times of the year. Overall, REDUNIQ Insights can be a useful resource for companies operating in the Portuguese market, especially for those looking to gain a competitive edge through data-driven insights.

However, while REDUNIQ Insights already offers valuable insights, there is a need to evaluate its current value proposition for its customized reports and identify potential areas for

improvement. At the same time, REDUNIQ has almost no insight into how their clients utilize the data, which challenges they face and how it affects their decisions-making.

This thesis aims to highlight the general challenges retailers face in analyzing and adopting retail analytics. It will also evaluate the current value proposition of REDUNIQ Insights, identify opportunities for improvement, and discuss the impact of REDUNIQ Insights on companies' decision-making processes in the Portuguese retail sector. Specifically, this thesis seeks to answer the following research questions:

Q1: What are the current barriers for retailers to adopt retail analytics, and what enables them to successfully utilize data?

Q2: What are the current capabilities and features of REDUNIQ Insights, and how do they contribute to its perceived value among users?

a.) How can user feedback and input be effectively integrated into the development and enhancement process of REDUNIQ Insights 2.0 to ensure its continued relevance and value?

Q3: How does REDUNIQ Insights impact and shape the decision-making processes of companies operating within the Portuguese retail sector?

The evaluation of these research questions will include a detailed analysis of the insights, features, benefits, and limitations of REDUNIQ Insights. Overall, this thesis contributes to understanding the role of data analytics in the retail sector and provide actionable insights for companies seeking to leverage data to drive growth and innovation.

1.1.3 Research Gap

While the existing literature on data analysis platforms in retail analytics provides valuable insights into the field, there remains a specific gap that this research seeks to address. The current literature explores various aspects of data visualization, analytics techniques, and applications in the retail sector (Aktas & Meng, 2017; Rooderkerk, 2021). Consulting firms' reports shed light on emerging trends and best practices in retail analytics (Accenture, 2022; Deloitte, 2019; McKinsey, 2018).

However, there is a noticeable gap in the literature concerning the holistic integration of internal and external data for retail analytics and the role of specialized data providers like REDUNIQ Insights. This research aims to address the gap on the potential value of external data by exploring the potential of REDUNIQ Insights as a tailored knowledge solution designed specifically for the retailers in Portugal.

In summary, while the existing literature offers a solid foundation, this research eagers to delve deeper into retail analytics' unique challenges and opportunities, particularly with a focus on specialized solutions like REDUNIQ Insights.

2 Literature Review

2.1 Introduction into Retail Analytics

2.1.1 Definition of Retail Analytics

The following literature review aims to provide an overview of the main concepts, research studies, and theories relevant to retail analytics. Retail analytics as a part of business analytics has become an emerging field that nowadays plays a critical role in the success and growth of modern retail organizations (Bilgic et al., 2021; Randhawa, 2019; Rooderkerk et al., 2022). This chapter aims to comprehensively understand retail analytics by addressing its definition and classification.

The Need for Enhanced Analytical Decision-Making in Retail

Given the significant role of retail analytics as a driver of economic growth, there is a growing demand for improved analytical decision-making processes (Rooderkerk et al., 2022). The requirement for improved analytical capabilities in retail has been highlighted by academics who have pointed out the need for innovative approaches to decision-making processes (Grewal et al., 2017).

Defining Retail Analytics

To begin, it is essential to define the term "Retail Analytics" as it is no longer comprises evaluating KPIs or simply monitoring and visualizing data (Randhawa, 2019; Rooderkerk et

al., 2021). Retail analytics is described as a comprehensive approach that involves data warehousing, which includes the systematic data collection and storage, analysis and decision-making which refers to the interpretation, and use of data (Figure 1) to gain actionable insights and make informed retail decisions (Ibrahim & Wang, 2019; Randhawa, 2019). With the emergence of specialized data solutions like REDUNIQ Insights, this data collection process can become more streamlined and efficient by already collecting and storing vast amounts of retail data.

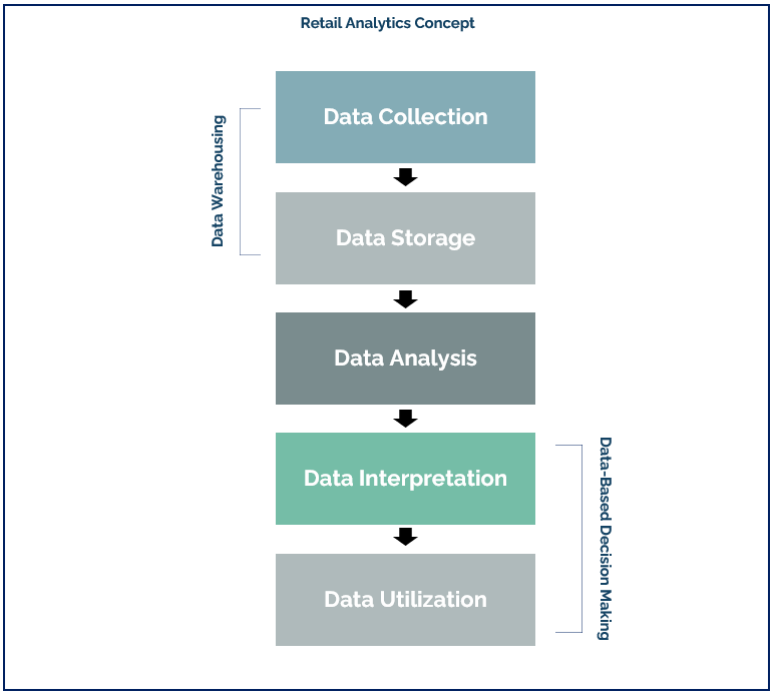


Figure 1:Retail analytic concept based on Randhawa (2019)

2.1.2 Classification of Retail Analytics

The classification of retail analytics approaches provides a structured framework for understanding the different methodologies and strategies employed in retail analytics. This

classification aids in organizing and categorizing the diverse range of techniques used to analyze retail data, including those employed by specialized solutions like REDUNIQ Insights.

Traditional Classification

Researchers and practitioners can better identify the most suitable methods for specific retail contexts and objectives by categorizing these approaches. The study *"The Past, Present, and Future of Retail Analytics: Insights from a survey of Academic Research and Interviews with Practitioners"* by Rooderkerk et al. (2022) provides valuable insights into the current state of retail analytics research and practice while also highlighting areas for future development. According to Rooderkerk et al. (2022), retail analytics can be divided into five categories that are illustrated in Figure 2: *descriptive analytics, diagnostic analytics, predictive analytics, prescriptive analytics*, and *autonomous analytics.*

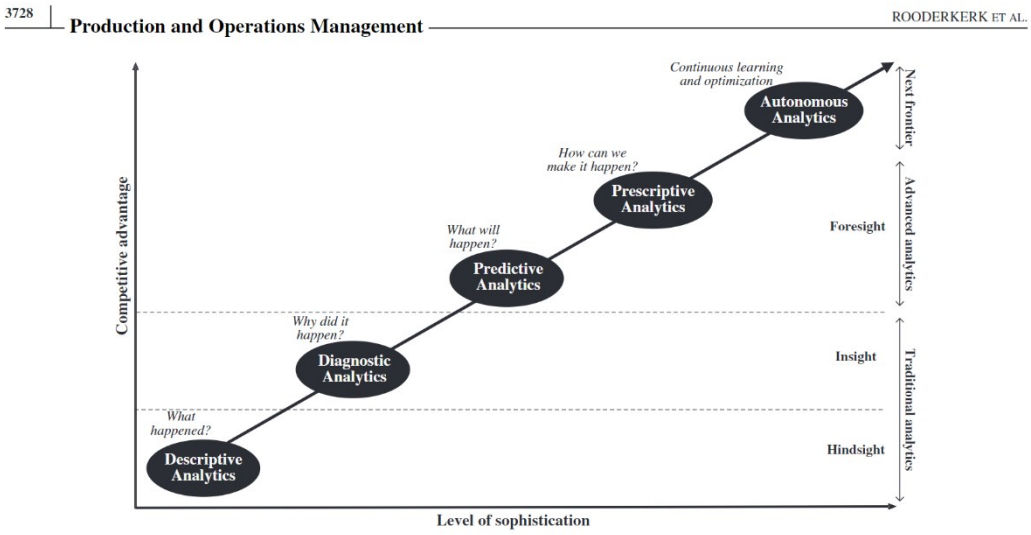


Figure 2: Dimensions of retail analytics from Rooderkerk et al. (2022)

Descriptive retail analytics involves the process of summarizing and interpreting historical data to extract valuable insights into prior performance, prevailing trends, and customer behavior (Chandramana, 2017; Rooderkerk et al., 2022). This method employs various tools and techniques like data visualization, reporting, and fundamental statistical analysis to offer a comprehensive overview of retail activities and their results. It lays the groundwork for more in-depth analysis and informed decision-making within retail enterprises (Rooderkerk et al.,

2022). Research by Berman and Israeli (2020) reveals that the adoption of descriptive analytics has a positive impact on the performance of online retailers.

In contrast, **diagnostic analytics** takes the analysis a step further by seeking explanations for why specific outcomes happened, effectively transforming historical data into valuable insights. (Rooderkerk et al., 2022).

Predictive analytics aims to forecast future trends, behaviors, and outcomes based on historical data and statistical modeling techniques (Puri et al., 2013). It revolves around forecasting future events, such as demand projections and product returns. By leveraging advanced algorithms and machine learning methods, predictive analytics helps retailers anticipate customer preferences, demand patterns, and market trends (Rooderkerk et al., 2022).

Prescriptive analytics, goes beyond prediction, providing normative recommendations for optimal courses of action. It guides decision-makers on how to proactively shape outcomes in to achieve desired outcomes (Soltanpoor & Sellis, 2016).

In recent times, the term **autonomous analytics** has gained prominence, representing a category of analytics that operates with minimal to no human intervention. Autonomous analytics excels in real-time decision-making by autonomously recommending optimal actions (Rooderkerk et al., 2022).

To illustrate these concepts in practice, the case of assortment planning is a suitable example. Beginning with descriptive analytics, retailers analyze historical sales data of assortment items. Diagnostic analytics follows to analyze why certain items outperformed others, considering factors like pricing, promotions, and inventory levels. Predictive analytics steps in when predicting sales for product line extensions, including new items with no historical sales data. Prescriptive analytics takes over by optimizing assortment composition based on these predictions. Finally, autonomous analytics come into play when an automated algorithm continuously adapts and presents online shoppers with an optimized assortment in real time, exemplifying the cutting-edge capabilities of retail data analytics (McKinsey, 2019).

Alternative Classifications

Additionally, alternative classifications offered by Randhawa (2019) and Bradlow et al. (2017) provide insights into how RI's data can be leveraged for specific business decisions into *consumer, product, workforce,* and *advertising*. In terms of consumer decisions, personalization is a key factor, such as offering personalized pricing based on customer purchase patterns and loyalty data. Product decisions involve inventory management, pricing, and assortment planning, where predictive modeling is used to forecast demand and understand customer preferences. Human resources decisions relate to scheduling and staffing based on workload estimation and customer volume. Advertising decisions involve selecting the best advertising medium and identifying products to promote effectively (Randhawa, 2019).

Bradlow et al. (2017) follows a similar approach, by focusing on the source type of the data by including three additional dimensions: *time*, *location* and *channel*. Time refers to the specific period during which retail data is collected, analyzed, or used for decision-making. Location marks the physical or geographical location where retail activities take place, such as a store, branch, or region. Channel represents the various distribution and communication channels through which retail products or services are made available to customers, including online, in-store, mobile, and more (Bradlow et al. 2017).

While the traditional classification primarily emphasizes the analytical methodologies and strategies used in retail analytics, tracing the progression from historical data analysis to proactive decision-making (Rooderkerk et al., 2022), it is important to note that it predominantly focuses on the 'how' of retail analytics, expounding on the various stages of analysis.

For the purpose of this research, this study follows the classification proposed by Bradlow et al. (2017) to specify the location and potential application of transaction data provided by REDUNIQ Insights. By adopting this perspective, it helps to measure the profound impact of REDUNIQ Insights on the decision-making processes of its clients and, in turn, the broader retail industry.

Sources of Data in Retail

While transaction data takes center stage in this study, it's crucial to acknowledge that retail analytics comprises multiple dimensions, including customer, product, time, location, and channel data. Based on the comprehensive framework by Bradlow et al. (2017) these dimensions interact and influence each other, forming a holistic understanding of retail operations as illustrated in Figure 3 (Bradlow et al., 2017).

Transaction data in Retail

Payment providers like REDUNIQ, which have access to real-life transaction data about their merchants' customers, have found a potential new revenue stream (EY, 2020). According to Accenture's report on the top ten banking trends for 2023 (Accenture, 2023), one of the key trends in the financial industry is the evolving nature of data as it transitions into a product.

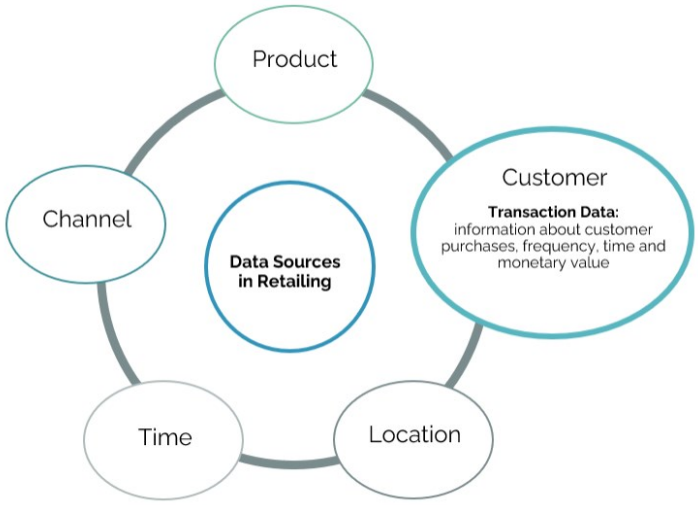


Figure 3: Dimensions of big data in retailing derived by Bradlow et al. (2017)

Transaction data represents a direct record of customer actions, capturing the essence of purchasing behavior, product preferences, and transactional patterns (Nesvijevskaia et al. 2021). Payment solution providers are aware of data's pivotal role in their core business operations and with data about consumers, transactions, and movements in the market, it offers opportunities to monetize this data by selling it to retailers and third-party companies (EY, 2020; McKinsey, 2017, Rodriguez, 2023).

Notably, there have been successful instances where payment solution providers have monetized transaction data while also providing significant value to retailers in optimizing their operations. For example, a luxury fashion retailer leveraged transaction data to create a robust customer financial scoring model. Furthermore, online retailers have employed algorithms to detect customer relocations to new cities, enabling strategic targeting (EY, 2020).

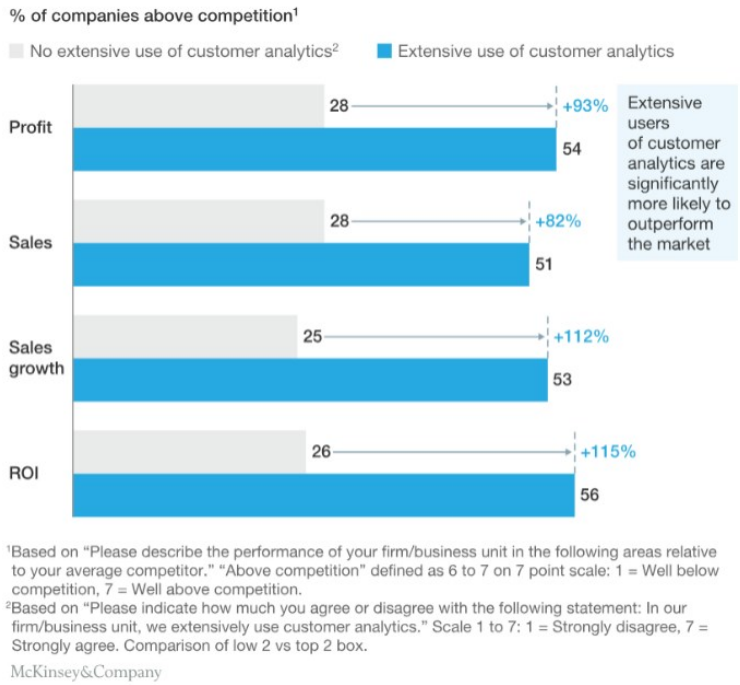
As this study dives deeper into the role of data analytics in retail, it is illustrated how various dimensions of data, including transaction data, interplay to provide insights into customer behavior and operational optimization. The following chapter will explore how these data-driven insights empower the retail industry through advanced analytics. Having gained insights into various dimensions of retail analytics, this study explores their practical application in the context the broader retail industry.

2.2 Market analysis

2.2.1 Impact of data analytics in retail

In today's retail landscape customers now have access to an enormous range of choice, which leads to higher expectations regarding a seamless shopping experience across all channels (Accenture, 2022). In response to this, data analytics in the retail industry is constantly evolving and growing as companies strive to gain a competitive advantage and meet the ever-evolving needs of their customers (Sazu and Jahan, 2022; Rooderkerk et al., 2022). By analyzing internal and external data, retailers can gain valuable insights into various aspects of their business that

Table 1: Impact of customer analytics on corporate performance derived by (McKinsey, 2016)



can help them make more informed decisions and drive growth (Bradlow et al., 2017). According to a survey conducted by McKinsey & Company, businesses leveraging data analytics have reported a remarkable 115% increase in return on investment (ROI) and a substantial 93% rise in profits which can be seen in Table 1 (McKinsey, 2016).

Besides the potential to optimize internal processes, Fisher and Raman (2018) note that data analytics can also help to execute current business models and wind down parts of the business that are not working. This information can then be used to create personalized marketing campaigns and promotions, monitor social media channels and online reviews, identify trends in sales data, and optimize supply chain management. As one of the critical benefits, Sazu and Jahan (2022), as well as Lekhwar et al. (2019) highlight, is that retailers are increasingly using big data analytics to gain insights into customer behavior, preferences, and purchase history and increase customer retention. Rooderkerk et al. (2022) identified that practitioners in the retail sector are using analytics primarily for purposes such as demand forecasting, inventory management, pricing optimization, and customer segmentation. However, according to Rooderkerk et al. (2022), there is substantial room for improvement in how firms use the analytical tools proposed by academics. To address this issue, the authors suggest that ensuring that practice can readily implement data is relevant to academics and practitioners alike, especially when seeking to impact retailer performance permanently.

2.2.2 Adoption of data analytics in retail

The adoption of data analytics in the retail sector has gained substantial momentum in recent years as retailers continually seek innovative ways to leverage data for improved decision-making. As technology advances and becomes more accessible, more retailers are expected to incorporate data analytics into their operations (Sabharwal & Miah, 2021).

This transformative shift has led retailers to acquire new skills and technologies to extract knowledge and value from data, enhancing their offerings and creating better retail environments for their customers (McKinsey, 2022). However, the extent of data analytics adoption in retail varies significantly by country and region, influenced by factors such as *technological readiness*, *organizational culture*, and *data availability* (Ghasemaghaei, 2019; Sun et al. 2018; Verma et al. (2018). According to the current literature, the adoption of retail

analytics is still currently low, and room for improvement needs to be tackled (Lorente et al., 2021).

2.2.3 Global and Regional Variation

The adoption of data analytics in retail varies across different regions and sectors, with larger retailers and those operating in more technologically advanced markets being quicker to adopt data analytics (Sun et al. 2018). However, as technology becomes more affordable and accessible, smaller retailers and those operating in emerging markets are increasingly adopting data analytics to remain competitive and drive growth (Nagpal et al.,2023). Globally, retailers have recognized the potential benefits of data analytics.

2.2.4 Factors Influencing the Digital Adoption

According to the current literature, the adoption of data analytics in retail is influenced by several factors, including technological readiness, organizational culture, and data availability (DeHoratius et al., 2023; Ghasemaghaei, 2019;Sun et al. 2018). The TOE (Technology-Organization-Environment) framework, developed by Tornatzky and Fleischer (1990), offers a multi-perspective lens through which to analyze technology adoption within organizations. It revolves around three critical contextual factors: *technology, organization*, and *environment*. The technology context encompasses the necessary equipment, processes, internal and external technologies. The organization context involves a deep dive into the firm's resources, size, structure, human capital, and managerial aspects, while the environment context extends to partners, competitors, macroeconomic factors, and regulatory considerations (Tornatzky & Fleischer, 1990). The current literature underscores several factors influencing the adoption of data analytics platforms.

Verma et al. (2018) find key factors such as relative advantage, complexity, compatibility, top management support, technology readiness, organizational data environment, and competitive pressure significantly influence adopters. Sun et al. (2018) identifies 26 factors affecting the organizational adoption of big data, including aspects of data privacy, compatibility, and cost of adoption. In the following, this study will identify which factors are particularly influential in encouraging retailers to adopt data analytics.

The TOE framework (Figure 4) provides a structured foundation for addressing the research questions and allow to test propositions related to the customized reports of REDUNIQ Insights that will be built on the academic literature.

Technology (T): In this context, technology refers to the capabilities and features of REDUNIQ Insights customized reports, like segmentation options.

Organization (O): Considers the organizational context in which the data from REDUNIQ Insights customized reports is implemented by its clients like company culture and leadership.

Environment (E): Analyzes the external factors that influence the adoption and perceived value of REDUNIQ Insights customized reports. This includes market dynamics, competition, regulatory factors, or trends in the retail and consumer goods sectors.

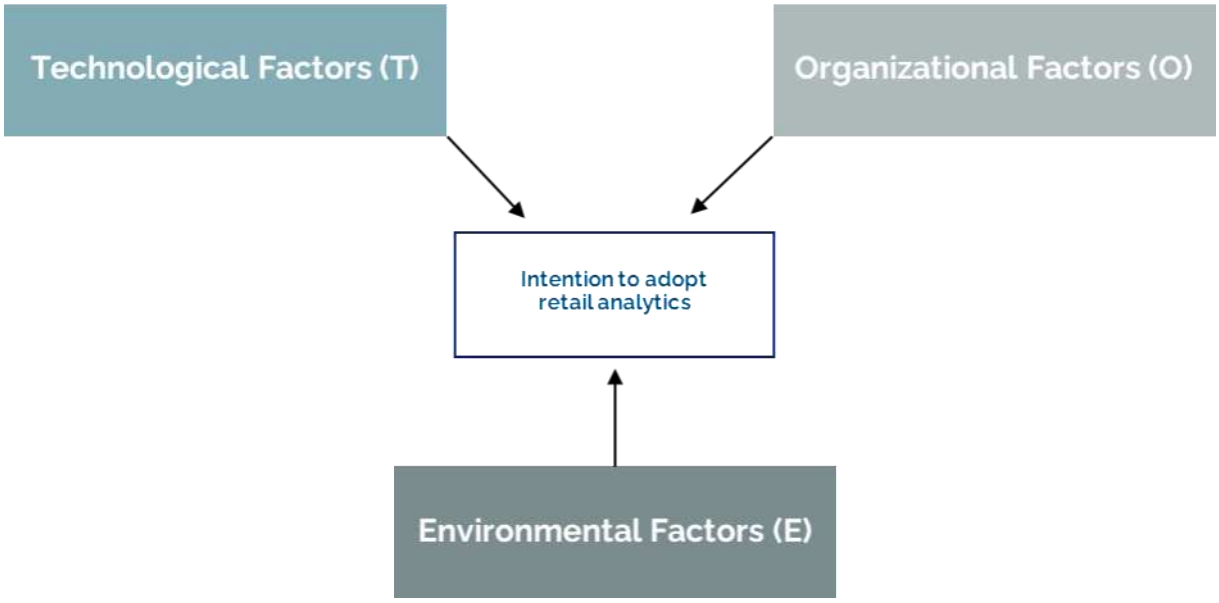


Figure 4: TOE framework based on Tornatzky & Fleischer (1990)

By systematically examining each dimension of the TOE framework, this research can provide a comprehensive assessment of the challenges, opportunities, and transformative potential of retail analytics adoption.

As retailers continue to recognize the benefits of leveraging data for insights and decision-making, the adoption of data analytics is expected to grow, helping businesses stay competitive

in an increasingly data-driven industry (Shankar, 2019). Despite challenges such as a shortage of skilled personnel and IT integration issues (Aktas & Meng, 2017), the adoption of data analytics in retail is steadily increasing both globally and in Portugal. In the following chapter, the factors of the adoption of retail analytics and data use are elaborated in more detail and the propositions will be formulated.

2.2.5 Challenges in the Adoption of Retail Analytics

The big data revolution has had a significant impact on the retail industry, presenting both opportunities and challenges for managers and researchers in the field (Dekimpe, 2020; Prasad & Venkatesham 2021; Silva et al., 2019). It has not only increased data availability but also transformed the entire retail value chain (Reinartz et al., 2018). While the business press is covered with a vast number of articles on the topic of big data and largely focusses on the benefits of retail analytics, the existing literature shows that many retailers still face major challenges in the processing and use of data for their business.

Scaling out big data initiatives across an entire organization can be difficult, even though many pilots have yielded encouraging results (Fisher & Raman, 2018; Singh at al., 2017). Dekimpe (2020) explores the opportunities and challenges that arise from the big data revolution from the perspectives of retail managers, researchers, policymakers, investors, and educators. He points out that the "*exploding size*" of data makes it harder to interpret it. But not only big retailers and companies, where the data amount is huge, struggle with handling the data. Nagpal et al. (2023) specifically also highlights the limitations of the adoption of analytics for SMBs as they mostly have *not enough resources* and the *sufficient infrastructure*.

In addition, the study of Bilgic et al. (2021) revealed that retailers are facing challenges in making sense of the significant amount of data for better understanding of their consumers. According to Matthew et al. (2015) another difficulty is the *identification of the right use case* to justify an investment. Analyzing vast amounts of data can be *costly and time-consuming*, that's why retailers need to invest in new technology and expertise to properly exploit big data (Fisher & Raman, 2018). As mentioned before, there are various types of conducting data and this also involves challenges. One problem is also to have the *right data quality and integration*. Issues with data quality, such as missing or inaccurate data can affect the accuracy of their

analytics models (Shang et al., 2020). Retailers also may struggle to integrate *data from multiple sources* such as POS systems, inventory management systems, and customer relationship management platforms into a single, unified dataset (Aktas & Meng, 2017). Similarly, it is pointed out that large data set are also prone to errors and not always representative (Dekimpe, 2020). The main challenges identified by the current literature are outlined in more detail:

Technological readiness

Current literature emphasizes that technological readiness in data analytics is crucial for organizations to create value and make data-driven decisions. However, it can also be a challenge for retailers. Ghasemaghaei (2019) highlights the significance of both structural and psychological readiness in enhancing firm value through big data analytics. Key factors affecting data analytics adoption in retail include the level of technological infrastructure and the availability of advanced analytical tools. Due to budget constraints and a staff shortage of adequate data skills, many retailers need more technical expertise to implement and maintain advanced analytics platforms (DeHoratius et al., 2023).

Organizational culture

To become a data-driven retail company, changing established cultures is essential. Organizational culture is pivotal in facilitating or hindering data analytics adoption (Lunde et al., 2019). Companies fostering cultures of innovation, learning, and data-driven decision-making are more inclined to embrace data analytics and allocate the necessary resources effectively Establishing quick wins to demonstrate the value of a data platform swiftly is crucial. This involves identifying data issues and taking corrective actions. By doing so, retailers can cultivate a culture that prizes data-driven decisions and embraces change for competitiveness (Accenture, 2022). However, resistance may arise from employees who need to become more accustomed to working with data or are skeptical about analytics' value. Retailers might also need to overcome departmental silos that hinder data sharing and insights collaboration (Rooderkerk et al. 2022)

Data availability

According to Accenture (2022), data availability and quality are essential factors in adopting data analytics. Sazu and Jahan (2022) mention that retailers face challenges accessing and integrating data from various sources. Retailers need access to accurate and timely data to make informed decisions based on analytics, and the study suggests that retailers may need to invest in technologies and tools that can help them integrate and manage large volumes of data effectively. This can include tools for data cleaning, transformation, and integration (Rooderkerk et al. 2022).

Data quality

Sazu and Jahan (2022) highlight challenges in implementing big data analytics in retail. Obtaining customer permissions for private data access is a key barrier, potentially leading to insufficient information for tailored services. Maintaining high-quality big data is also crucial but challenging, with many retailers struggling with accuracy and integration issues (Rooderkerk et al., 2022). These data problems can compromise the accuracy of analytics models, resulting in missed opportunities, inefficient resource allocation, and reduced competitiveness (Aktas & Meng, 2017).

Data Governance

Data governance is critical for retailers to unleash the value of their data and gain a competitive advantage, according to Ladley (2012). Effective data governance is essential for ensuring data quality, integrity, and accuracy in the retail sector (Martijn et al., 2015). Retailers face challenges related to data integration from multiple sources, inconsistencies, and data silos within their organizations (Chen et al., 2012). Implementing a comprehensive data governance framework helps address these challenges by establishing data standards, data quality controls, and data management protocols (Koltay, 2016). It enables retailers to have a unified view of their data, make informed decisions, and ensure that data is reliable and trustworthy.

Ethical Use of Customer Data

Ethical use of customer data is paramount in retail analytics (Chandramana, 2017). Retailers must respect privacy rights, avoid unauthorized data sharing, and maintain consumer trust (Saarijärvi et al., 2015). Ethical retail analytics involves transparent data collection, informed

consent, and giving customers control over their data (Martin & Palmatier, 2020). Establishing ethical guidelines is crucial (Fisher & Raman, 2018), including safeguarding sensitive data through anonymization and robust security measures. Privacy concerns especially arise from using consumer transaction data (Shang et al., 2020). Consumers may object to using their data without consent, risking exposure or misuse of sensitive information without proper security.

2.2.6 The Impact of Retail Analytics

Besides the challenges, that arise in the adoption of retail analytics it is crucial to understand what impact data analytics can have along the retail value chain. The literature is detecting several areas where the utilization of data analytics in the retail sector offers far-reaching implications for enhancing operational efficiency and customer satisfaction (Bradlow et al., 2017; Fisher & Raman, 2018). The study by Rooderkerk et al. (2022) analyzed papers published in top operations management journals from 2000-2020, revealing that analytics is used in various areas across the retail value chain. Lekhwar et al. (2019) and Shankar (2019) highlight how big data analytics can increase customer engagement and improve bottom-line performance. Aktas and Meng (2017) identify four key themes for big data applications in retail logistics as *availability*, *assortment*, *pricing*, and *layout planning*. Nevertheless, these papers equally acknowledge the challenges faced during the implementation of big data analytics in retail, such as the lack of workforce with the required analytical skills and the complexities of IT integration. This chapter delves into research and practical insights regarding the impact of data analytics on retail performance, covering different areas such as inventory management, personalized marketing, demand prediction, in-store operations, customer returns, pricing optimization, and customer segmentation.

Inventory Management & Supply Chain Optimization

Adequate inventory and supply chain management are crucial for retail success. Fisher and Raman (2018) and Shang et al. (2020) note that retail analytics enables retailers to understand demand, optimize inventory, and enhance supply chain efficiency. They analyze sales data for top-selling products and adjust inventory levels to prevent overstock or stockouts. Returns data analysis improves reverse logistics. Additionally, big data analytics, as highlighted by Sazu and Jahan (2022), aids retailers in optimizing supply chains by analyzing inventory levels, demand,

and delivery times. It enhances inventory forecasting accuracy, reducing stockouts and overstocks(Chandramana, 2017). Returns data also optimizes reverse logistics processes, reducing costs. Real-time data collection empowers retailers for timely and accurate deliveries, offering flexibility for supply chain workers (Accenture, 2022).

Personalized Marketing

Personalized marketing, a key component of retail analytics, utilizes customer data to create customized marketing strategies. By delivering relevant and timely communications, retailers establish a deeper emotional connection with customers, enhancing engagement, loyalty, and sales (Fisher & Raman, 2018; Seetharaman et al., 2016). Leveraging analytics, retailers offer personalized recommendations and experiences that boost satisfaction and encourage repeat business, resulting in higher conversion rates, increased order values, and improved customer lifetime value (Bradlow et al., 2017). For instance, Target's Market Basket Analysis tailored promotions to pregnant women, showcasing a deep understanding of its customers and boosting loyalty and conversion rates (Bradlow et al., 2017).

Demand Prediction

Retailers can utilize data analytics to identify product preferences among customer segments and the effectiveness of marketing campaigns (Fisher & Raman, 2018). Analyzing historical sales data, market trends, and customer behavior provides valuable insights into future demand patterns. This insight aids in making precise demand forecasts, optimizing inventory, and improving supply chain operations (Nagpal et al., 2023). Accurate demand prediction enables retailers to optimize inventory management, reducing both stockouts and overstocks while ensuring product availability when needed Sazu and Jahan (2022). For instance, Amazon's recommendation system analyzes customer browsing and purchase history, employing collaborative filtering algorithms to recommend products, boosting sales and customer satisfaction. Through the process of retail analytics and advanced predictive models, retailers enhance decision-making and operational efficiency in the fiercely competitive retail landscape.

In-store operation

Retailers can significantly enhance in-store operations and the overall customer experience through retail analytics. Data-driven insights inform decisions, particularly in optimizing store layouts. Analyzing foot traffic patterns guides layout, product placement, improving flow, customer navigation, and sales (Bradlow et al., 2017; Fisher & Raman, 2018). Advanced technologies like sensors and IoT devices enable real-time inventory tracking, reducing out-of-stock occurrences and streamlining restocking (Fisher & Raman, 2018; Seetharaman et al., 2016). Analyzing customer data equips store associates with personalized customer knowledge, enabling tailored assistance and product recommendations fostering satisfaction, loyalty, and advocacy (Hossain et al., 2020; Seetharaman et al., 2016).

Customer Experience Enhancement

Retailers can harness big data analytics to improve the customer experience (Fisher & Raman, 2018; Sazu & Jahan, 2022). This involves gaining insights into customer behavior, preferences, and purchase history to enable personalized interactions (Bradlow et al., 2017). Machine learning analytics also offer opportunities for enhancement (Wang et al., 2021). Monitoring social media and online reviews allows retailers to analyze customer sentiment and identify areas for improvement, fostering continuous enhancements and customer loyalty (Sazu & Jahan, 2022).

Pricing optimization

Retailers can use data analytics to optimize their pricing strategies by analyzing competitor pricing and demand for certain products (Chandramana, 2017). Retail analytics provides retailers with the opportunity to optimize pricing strategies and effectively segment customers. By analyzing sales data and identifying trends, retailers can adjust pricing strategies to align with customer preferences and market demands (Fisher & Raman, 2018).

Customer segmentation

Retailers can leverage big data analytics to stay competitive and enhance their operations (Fisher & Raman, 2018). By analyzing sales data, they can adjust product offerings to meet customer demand, increasing satisfaction and revenue growth (Bradlow et al., 2017). As highlighted by Accenture (2022), data-driven retailers can connect data across their supply

chain, empower employees with real-time information, and create varied customer touchpoints. This approach builds trust and allows for better customer interactions. Retail analytics offers a deeper understanding of customer behavior and patterns (Gregorczuk, 2022). Retailers can gain insights into customer behavior, product trends, location, and channel preferences, leading to improved experiences, optimized inventory management, targeted marketing, and efficient supply chain operations (Bradlow et al., 2017).

In conclusion, data analytics profoundly impacts retail performance across various areas of the industry. From inventory management and supply chain optimization to personalized marketing, demand prediction, in-store operations, pricing optimization, and customer segmentation, data analytics empowers retailers to make informed decisions and enhance operational efficiency and customer satisfaction. Figure 6 is illustrating the application areas of retail analytics along the retail value chain.

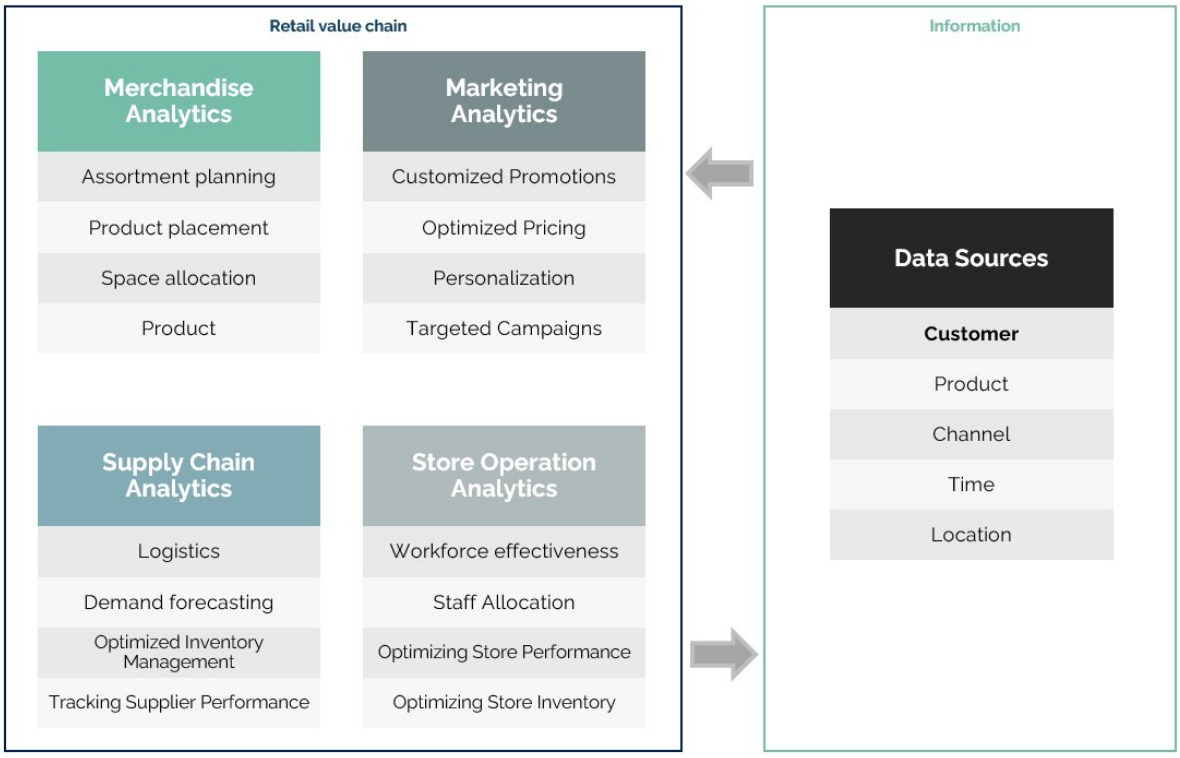


Figure 6: Data analytics along the retail value chain based on PWC (2016)

By leveraging data-driven insights, retailers can adapt to customer preferences, improve store layouts, streamline supply chains, and foster loyalty through personalized experiences. In the intense competitive retail landscape, adopting retail analytics and advanced predictive models enables retailers to optimize decision-making and thrive in a data-driven world.

3 Methodology

3.1 Research Design

3.1.1 Research Design & sampling

This section outlines the methodology employed for this study. In order to examine the research question and test the propositions shown in Figure 6, this thesis employs a qualitative research approach, including qualitative in-depth interviews with current and former clients of the customized reports, potential customers as well as industry experts. By examining the current state of REDUNIQ Insights, identifying areas for improvement, and proposing improvements for the setting a path to REDUNIQ 2.0, this thesis aims to contribute to the growing field of retail analytics and help retailers make better use of their data.

Qualitative research was chosen as the appropriate approach for this thesis, specifically utilizing semi-structured interviews, based on the findings of the literature, since the research question of the thesis aims to evaluate the current value proposition of REDUNIQ Insights and identify opportunities for improvement in the context of the retail sector. The qualitative approach enables an in-depth exploration of participants' experiences, perspectives, and usage of REDUNIQ Insights, providing rich insights into the impact of the platform on the decision-making processes, while also in general getting insights into the challenges of the adoption of retail analytics faced by companies (Saunders et al. 2019).

Semi-structured interviews were chosen as the primary data collection method to capture detailed and detailed information from current and former client of the customized reports as they held great capacity for in-depth exploration. Unlike surveys or closed-ended questionnaires, which offer limited insights, semi-structured interviews allow for open-ended questions.This enables participants to express their thoughts, experiences, and perspectives in greater detail. Semi-structured interviews generate rich qualitative data as participants can

provide context, anecdotes, and narratives that enrich the understanding of the research topic. This qualitative depth is valuable when investigating complex and multifaceted subjects (Saunders et al., 2019).

As the customized reports were just introduced by REDUNIQ the data sample would have not been huge enough to conduct a quantitative approach for assessing the current value, but nevertheless, essential insights can be gained from the in-depth interviews. The selected approach allows for flexibility in questioning and encourages participants to share their experiences and perceptions of REDUNIQ Insights freely and unbiased. The semi-structured interview format enables the exploration of participants' *usage of the platform*, *perceived benefits, limitations encountered*, and *suggestions for improvement*. Additionally, it allowed to also get insights in the use cases of retailers.

3.1.2 Participants selection

The selection of interview participants was a critical aspect of this study. The sample of participants was selected using purposive sampling, targeting individuals with direct involvement in using REDUNIQ Insights within the Portuguese retail and consumer goods markets. This sampling approach ensured a diverse range of perspectives and experiences, enhancing the richness and depth of the data collected (Saunders et al., 2019).

REDUNIQ was involved in reaching out to the current and potential clients of REDUNIQ Insights. The sample size was determined by reaching data saturation, which is the point at which no new information and insights cease to emerge from additional data collection (Saunders et al., 2019). For this thesis, a total of seven interviews (Figure 8) were conducted, including four interviews with current clients of REDUNIQ Insights that used or a still using REDUNIQ insight reports, one interview with a retail analytics expert, and two interviews with data experts from the retail sector. Clients of REDUNIQ Insights represented various segments of the Portuguese retail market, while data experts and a retail analytics expert provided specialized knowledge.

Participants with direct involvement in using REDUNIQ Insights are being crucial for this study as they are more likely to possess firsthand, practical knowledge and experiences related to the knowledge solution and the customized reports that are being reviewed. Also, it is extremely

valuable to the research to additional interview former customers to identify which made them stop using this platform. The rationale behind this selection was to capture a diverse range of perspectives and expertise relevant to the research objectives. The clients were directly contacted through the Account Team of REDUNIQ.

3.1.3 Data Collection

Interviews were scheduled together in consultation with REDUNIQ over a period of two months, considering the availability and preferences of the participants. All interviews were held over Microsoft Teams and took around 30 min to 60 minutes. The interviews were recorded after the agreement of the participants. Different interview guides (Appendix C1, Appendix 2) were developed for the clients of REDUNIQ, to provide a framework for the interviews in contribution with the REDUNIQ. The interview guides included open-ended questions that explored various aspects related to REDUNIQ Insights, such as its current capabilities, usage by retailers, limitations, and potential improvements. The semi-structured interviews were conducted individually with each participant and the interviews were audio-recorded with participants' consent to capture accurate and detailed responses, allowing for thorough analysis during the data interpretation phase. In the introduction to each interview, the interview partner was provided with clear information about the study's purpose and that their data is be kept confidentially. Informed consent was obtained from all participants, and they were assured of their anonymity and confidentiality. The measures were taken to ensure the privacy and security of participants' data, including the anonymization of all interview transcripts.

Interview	Sector	Company type	Country	Job title	Client (yes/no)	Still buying customized reports
Interview A	Public Sector	Municipal	Portugal	Innoation & Marketing Manager	yes	yes
Interview B	Retail	Fashion Retailer	Switzerland	Head of Merchandising & Controlling	no	-
Interview C	Hospitality	Hotel Group	Portugal	CEO	yes	no
Interview D	Retail	Grocery Retailer	Germany, Austria, Australia & USA	Global Sourcing Manager	no	-
Interview E	Public	Outlet Association	Portugal	Director	yes	yes
Interview F	Education	Academic Expert	Portugal	Retail Analytics Expert	no	-

Figure 5: List of expert interviews

3.1.4 Research Model

The following research model is constructed based on the TOE framework (Figure 4). It is extended by various factors in each dimension, which is supposed to influence the intention to adopt retail analytics (Figure 7). The following propositions are developed and will be explored by the qualitative research to answer the research questions.

To fully leverage the potential of REDUNIQ Insights data, companies must have the analytical capabilities to be able to analyze and interpret the data and to draw the right conclusions from it. Thus, it is important to elaborate:

Q1: What are the current barriers for retailers to adopt retail analytics, and what enables them to successfully utilize data?

In order to explore the research question, it is necessary to see whether certain factors can be assumed to affect the adoption of retail analytics. The literature illustrates that organizational culture can either hinder or enable the adoption of retail analytics (Lunde et al., 2019). Researchers also highlight that retailer a still lacking a data-driven culture (Fisher & Raman, 2018; Lorente et al.,2021) Also, according to the literature, the appropriate resources to analyze and use the data are missing (Nagpal et al.,2023). Thus, the following proposition is formed and explored by content analysis of the Interviews:

- **P1**: Organizational challenges like resource limitations and the company culture can affect the intention to adopt retail analytics.

Based on Bradlow et al. (2017) and Sun et al. (2018) data security, ethical & privacy concerns are also hindering the adoption of data, hence the second proposition is:

- **P2**: Data security, ethical & privacy concerns are hindering companies to adopt retail analytics.

Besides the factors concerning customers and potential customers, it is also important for REDUNIQ to evaluate their solution platform. In order to improve REDUNIQ Insights, the interviews with customers will be used to explore:

Q2: What are the current capabilities and features of REDUNIQ Insights, and how do they contribute to its perceived value among users?

The findings from the interviews are intended to shed further light on:

a.) How can user feedback and input be effectively integrated into the development and enhancement process of REDUNIQ Insights 2.0 to ensure its continued relevance and value?

From the literature, it became clear that data complexity, data matching and data volume have a negative impact on data utilization (Aktas & Meng, 2017; Dekimpe, 2020; Shang et al., 2020).

This results in the following proposition:

- **P3**: Challenges and limitations reported by users and stakeholders in relation to REDUNIQ Insights data such as the complexity of data analysis impact the overall effectiveness and value of the data.

For REDUNIQ it is also currently unclear which decisions are made by the customers. To ensure improved utilization, it should be explored which use cases current clients have for the customized reports by REDUNIQ Insights. By Interviewing current clients, the aim is to investigate:

Q3: How does REDUNIQ Insights impact and shape the decision-making processes of companies operating within the Portuguese retail sector?

Data is said to provide important insights to make better and data-based decisions as stated by Randhawa et al. (2019), Berman and Israeli (2019) and Soltanpoor and Sellis (2016). Based on the literature, the following proposition is set:

- **P4**: The insights of the customized reports by REDUNIQ Insights influence the decision-making of the company.

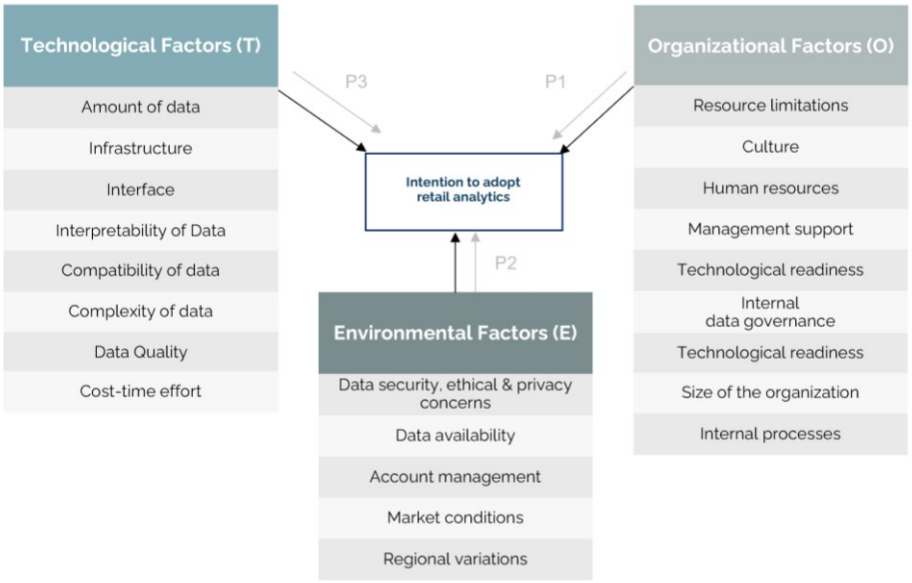


*Figure 7: **TOE framework with propositions adapted from Sun et al. (2018)** and Bradlow et al. 2017)*

4 Data Analysis

4.1 Qualitative Content Analysis

The collected data underwent a rigorous analysis process. Initially, all interviews were transcribed to ensure a clear and accurate representation of the participants' responses. These transcriptions formed the foundation for the content analysis. Content analysis will be employed to analyze the interview data collected from the participants. This approach involves identifying patterns, themes, and categories within the data to derive meaningful insights (Saunders et al. 2019). This analysis is based on the qualitative content analysis according to Mayring (Mayring & Fenzel, 2019). At the center of the evaluation process is the systematic coding of text material. The process followed Mayring's seven-step qualitative content analysis (Figure 8). These steps provided a structured approach to systematically analyze and extract meaningful insights from qualitative data.

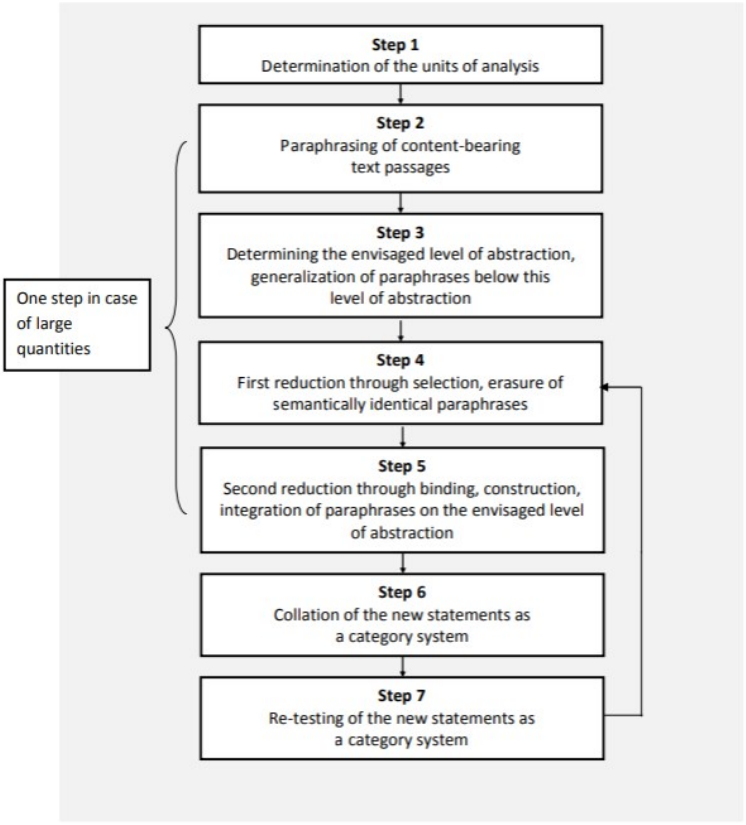


Figure 8: Model of content analysis after Mayring & Fenzel (2019)

From the literature, several codes were screened out to serve as the basis for the analysis in a coding framework (Table 2). In a total 41 Codes were selected after the first coding process and categorized based on the TOE framework (Figure 7). These codes were derived from the comprehensive review of the literature on retail analytics.

The factor DDDM refers to decision-making processes and describes the different application areas of data utilization in retail like Supply Chain Management or Marketing. The analysis will involve a systematic and iterative process of coding, categorizing, and interpreting the data to identify key findings related to the impact of REDUNIQ Insights on the decision-making processes of companies in the Portuguese retail market.

On the one hand, the coding process works deductively with a (theoretically based) system of categories; on the other hand, the categories can also emerge from the data material (inductively). In this data analysis, a deductive coding approach was employed, complemented by inductive coding. This approach involves using pre-established codes derived from existing

literature and theories as a basis for analysis. Deductive coding, in conjunction with inductive coding, demonstrates methodological rigor. It allows to not only explore emergent themes but also test and validate existing theories in the context of the study (Mayring & Fenzel, 2019). This balanced approach enhances the intersubject comprehensiveness of this analysis.

Table 2: Coding framework based on findings of the literature review

No	Factor	Category	Codes	Description	References
1	T	Amount of data	Data Utilization Overload	Struggling with managing too much data.	*Dekimpe (2020)*
2	T	Infrastructure	Different data silos	Isolated data repositories causing fragmentation.	*Rooderkerk et al. (2020)*
4	T	Interpretability of Data	Lacking in fidning the right use case	Difficulty in identifying suitable data applications.	*Bilgic et al. (2021)*
6	T	Complexity of data	Challenges in analyzing complex data	Dealing with intricate data sets.	*Verma et al. (2018)*
7	T	Data Quality	Ensuring data accuracy and reliability	Focusing on trustworthy information.	*Dekimpe, (2020); Shang et al., (2020); Rooderkerk et al., (2022)*
8	T	Data Governance	Effective data governance	Establishing rules for data management.	*Ladley (2012); Martijn et al. (2015)*
9	O	Data Integration	Complexities in comparing insights due to differing bases	Handling diverse data sources.	*Chen et al., (2012); Koltay, (2016)*
10	O	Cost-time effort	Difficulty in time, resources, and expertise	Resource and skill shortages.	*Nagpal et al. (2023)*
11	O	Resource limitations	Need for more technical ressources	Lack of necessary tech capabilities.	*Rooderkerk et al., (2022).*
12	O	Culture	Creating a supportive culture	Encouraging data-driven mindset.	*Accenture (2022); (Lunde et al., 2019)*
13	O	Human resources	Resource limitations	Facing constraints in available resources.	*Nagpal et al. (2023)*
16	O	Technological readiness	Readiness to adopt and use new technology	Willingness to embrace tech.	*Ghasemaghaei (2019)*
19	E	Size of the organization	Challenging for bigger companies to adapt data culture	Large organizations adapting to data.	*Nagpal et al. (2023)*
22	E	Impact of Covid-19 on Data Utilization	Growing signifance of data analytics	Increasing importance of data.	*Sides & Skelly (2021)*
24	DDDM	Data security, ethical & privacy concerns	Growing Data security and privacy concerns	Rising worries about data protection.	*Sun et al. (2018)*
25	DDDM	Future Trends	Predicitons & Forecasting	Using data for future predictions.	*Nagpal et al., (2023); Rooderkerk et al. (2022)*
26	DDDM	Data availability	Data needs to be accessible	Data that's easily reachable and understandable.	*DeHoratius et al., (2023)*
28	DDDM	Market trends	Growing importance of data	Recognizing data's strategic value.	*McKinsey, (2022)*
29	DDDM	Regional variations	Technologically advance markets are quicker to adopt data	Quick adoption of data tech.	*Chandramana, (2017)*
30	DDDM	Business Model Evaluation	Optimizing Internal processes	Streamlining company operations.	*Bradlow et al., (2017)*
31	DDDM	Business Insights	Increasing Customer Engagement	Enhancing interactions with clients.	*Lekhwar et al. (2018); Shankar et al. (2019)*
32	DDDM	Data-Driven-Decisionmaking	More Informed Decision	Making better choices with data.	*Rooderkerk et al. (2022)*
33	DDDM	Data Monetization	Driving Business Growth	Using data for company expansion.	*Bradlow et al., (2017)*
34	DDDM	Marketing	Personalized marketing campgains & promotions	Tailoring ads for individuals.	*Randhawa, (2019)*
35	DDDM	Supply Chain Management	Increase Supply Chain Efficiency	Enhancing logistics with data.	*Aktas & Meng (2017); Sazu and Jahan (2022); Fisher & Raman (2018)*
36	DDDM	Operations	Optimise Opperation Efficicency	Improving overall processes.	*DeHoratius et al., (2023)*
37	DDDM	Sales	Increasing Customer Satisfaction	Enhancing client experiences.	*Bradlow et al., (2017)*
38	DDDM	Product Management	Identifying product trends	Spotting market trends with data.	*Bradlow et al., (2017); Gregorczuk, (2022).*
39	DDDM	Strategy	Optimizing Pricing Strategies	Setting prices based on data.	*(Fisher & Raman, 2018)*
41	DDDM	Predictive Modelling	Demand forecastings	Predicting future product demand.	*Puri et al. (2013)*

Coding with MAXQDA

Following the transcription, data analysis was conducted using MAXQDA, a qualitative data analysis software. MAXQDA provides a tool for organization, coding and categorizing, and systematic examination of the interview data (Appendix B2). It allows for the systematic organization of interview transcript, and it enabled the identification of recurring themes, patterns, and meaningful insights within the dataset (Appendix B3). It also allows for the

creation of codes, categories, and memos, facilitating the development or adaption of a comprehensive coding framework. This approach ensured a comprehensive exploration of the data and provided a robust foundation for drawing conclusions and discussing findings (Mayring & Fenzel, 2019).

The content analysis approach was employed to categorize and interpret the qualitative data effectively based on the established coding framework. This involved an iterative process of coding and theme development, which helped uncover key findings related to the impact of transaction data on the decision-making process in the Portuguese retail market. The utilization of MAXQDA and the transcription process ensured a robust and systematic analysis, contributing to the reliability and validity of the study's findings.

5 Results

This section presents the finding from the research, which aims to explore the challenges retailers and clients of REDUNIQ Insights are facing and which impact the customized reports, have on the decision-making processes of REDUNIQ Insights clients. The analysis is based on the insights gathered from the qualitative interviews. The initial coding framework (Table 2) based on the academic literature was developed to guide the initial coding process and adapted by the detected codes from the coding process of the interviews.

After a reviewed coding process the codes were categorized and reviewed again resulting in Appendix B. The summaries of each of the Interviews can be seen in Appendix D.

What is evident is that "*Data Utilization Overload*", "*Lacking in finding the right use case*", "*Need for more segmented reports*" and "*Easy readability of data and using the solution*" occur most often across the interviews. These dimensions will be discussed in more detail in the following section. After reviewing the established codes, it was necessary to further consolidate the findings to interpret the data. The codes from Table 3 have been further developed into seven coding categories based on DeHoratius et al. (2023) and Sun et al. (2018) including *culture, organization, people, processes, system/tools, data,* and *environment* (Figure 9).

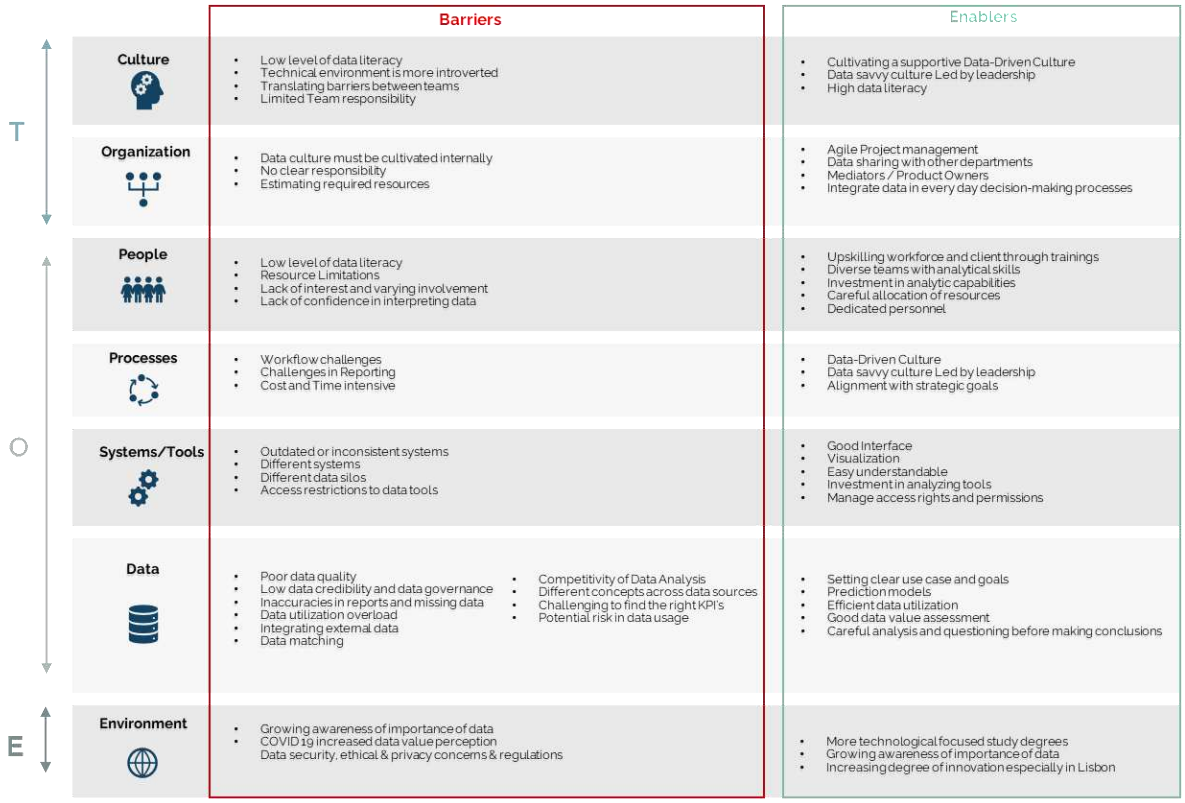


Figure 9: Barriers and enablers for data adoption

The intention to adopt retail analytics in organizations is dependent on three main factors categorized in Figure 4. Through the qualitative analysis it could be detected which variables are acting as a *barrier* or an *enabler* in each coding category (Figure 9), which allows to test the propositions and answer the research questions starting with Q1:

Q1: What are the current barriers for retailers to adopt retail analytics, and what enables them to successfully utilize data?

One goal of this study is to identify the challenges and barriers retailers are currently facing while using and analyzing data. Having established the foundational context for this research, the focus now shifts to the barriers inherent in the utilization of transaction data within the retail market. Identified through qualitative interviews with key stakeholders, the subsequent sections

will delve into these barriers and enabler for data utilization, offering insights into their complexities and implications for the retail sector. In the following each dimension is being analyzed.

5.1 Organizational Factors

Culture

Historically, data collection was a time-consuming process that required significant manual effort. However, the advent of automation has revolutionized the landscape of data analysis and reporting, providing organizations with the ability to make rapid, data-driven decisions. This paradigm shift has led to an increased emphasis on data culture within organizations, as they recognize the need to move away from traditional, opinion-based decision-making in favor of data-backed insights.

"there is a need to, um, cultivate this data culture inside of organizations because people need to start working based on data and not just in their opinions. (Interview 01)"

Barriers

- **Low Data Literacy**: Employees lacking essential data skills hinder data-driven practices.
- **Introverted Tech Environment**: Inhibits open data communication and collaboration.
- **Team Communication**: Breakdowns data flow and alignment across departments.
- **Limited Team Roles**: Bottlenecks and data silos arise from restricted data responsibilities.
- **Privacy Concerns**: Balancing data use and privacy rights deters full adoption.

Enablers

- **Data-Driven Culture**: Prioritizing data fosters informed decision-making.
- **Leadership's Role**: Championing data-savvy culture sets the organizational tone.
- **High Data Literacy**: Equipping employees with data skills fuels data-driven initiatives.

In conclusion, the role of organizational culture in data utilization cannot be overstated. Barriers such as low data literacy, introverted technical environments, and privacy concerns can impede progress. However, by cultivating a data-driven culture, promoting data literacy, and demonstrating leadership commitment to data, organizations can overcome these barriers and harness the full potential of data for informed decision-making.

Organization

Organizational structure is a fundamental aspect of how businesses operate and make decisions (DeHoratius et al., 2023). This chapter explores, how specific aspects of organizational structure can either facilitate or hinder the effective usage of data within an organization. Both enablers and barriers related to data usage will be examined in this context.

"I have conscience of that didn't dedicate probably enough time to work on that specific data." (Interview 6)

Barriers for

- **Lacking Data Culture Internally**: Organizations must foster a culture that values data-driven decisions. Without it, employees may resist adopting data-driven practices.
- **Unclear Responsibility for Data**: When no department or individual is clearly responsible for data, it can lead to data silos, quality issues, and a lack of accountability.
- **Estimating Required Resources**: Determining the budget, staffing, and infrastructure needed for data projects can be challenging, hindering data initiatives.

Enablers

- **Agile Project Management**: Agile methodologies break down complex data projects into manageable phases, promoting quicker implementation and adaptability.
- **Data Sharing with Other Departments**: Efficient data sharing fosters cross-functional collaboration and ensures insights reach the right stakeholders.
- **Mediators / Product Owners**: Individuals bridging the technical and non-technical aspects of data can facilitate smoother integration and utilization.

- **Integration of Data in Decision-Making**: When data becomes integral to daily decision-making, employees are more likely to embrace data-backed insights.

Organizational structure plays a pivotal role in data utilization. Overcoming barriers and leveraging enablers can help organizations build a data-driven culture and optimize their data-related processes.

***P1**: **Organizational challenges** like resource limitations and the company culture can affect the intention to adopt retail analytics.*

Based on this P1 can be confirmed.

People

In the ever-evolving landscape of data-driven decision-making, the role of individuals within organizations cannot be overstated (Nagpal et. al, 2023). The ability of people to understand, interpret, and act upon data is pivotal to the success of any data-centric initiative. This chapter explores the critical dimension of 'People' in the context of data utilization.

"Like for example, we have a data team as well, works in every kind of information, but they are very few." (Interview 1)

"Not everybody has a high level of data literacy, for example, or are able to correlate different parameters to get some other information from the simple information that you are presenting on." (Interview 1)

Barriers

- **Low Level of Data Literacy**: When individuals lack the necessary data literacy skills, they may struggle to understand, interpret, and utilize data effectively.
- **Resource Limitations**: Insufficient resources, including personnel and technology, can hinder individuals from leveraging data to its fullest extent.
- Lack of Interest and Varying Involvement: A lack of enthusiasm or varying levels of engagement among team members can impede collaborative data initiatives.

- **Lack of Confidence in Interpreting Data**: Individuals may hesitate to make data-driven decisions due to a lack of confidence in their data interpretation skills.

Enablers

- **Upskilling Workforce and Clients Through Training**: Training programs can enhance data literacy among employees and clients, empowering them to work with data more effectively.
- **Diverse Teams with Analytical Skills**: Teams comprising individuals with diverse backgrounds and strong analytical skills can provide valuable perspectives and insights.
- **Investment in Analytic Capabilities**: Allocating resources to improve data analytics capabilities can lead to more informed decision-making.
- **Careful Allocation of Resources**: Ensuring that resources are allocated strategically and efficiently can maximize their impact on data projects.
- **Dedicated Personnel**: Having dedicated individuals responsible for data-related tasks can streamline processes and improve data utilization.

People are the driving force behind data utilization (Sun et al., 2018). Overcoming barriers and capitalizing on enablers can empower individuals to harness the potential of data and drive informed decision-making.

5.2 Technological Factors

Processes

This chapter explores the role of processes in data utilization, identifying barriers that can hinder progress and enablers that can facilitate effective data-driven workflows.

"The marketing department speaks a completely different language than we do... But what this means in the technical area and how it is implemented is another question." (Interview 5)

Barriers

- **Workflow Challenges**: Complex or inefficient workflows between teams can impede the smooth integration of data.

- **Challenges in Reporting**: Difficulties in generating and delivering timely, accurate, and meaningful reports can hinder data utilization.
- **Cost and Time-Intensive Processes**: Processes that require significant time and resources can deter organizations from effectively leveraging data.

Enablers

- **Data-Driven Culture**: Fostering a culture where data is central to decision-making can encourage streamlined and effective data processes.
- **Data Savvy Culture Led by Leadership**: Strong leadership committed to data literacy and best practices can set a good base for data-savvy processes.
- **Alignment with Strategic Goals**: Ensuring that data processes align with strategic objectives helps prioritize and streamline data-related activities.

Efficient processes are essential for successful data utilization. By addressing barriers and capitalizing on enablers, organizations can optimize their data workflows and enhance decision-making.

System/Tools

"And there the challenge is not only the technology itself, but the different data silos that exist because their data is stored in there." (Interview 5)

Barriers

- **Outdated or Inconsistent Systems**: Legacy or inconsistent systems can create bottlenecks, hindering efficient data processing.
- **Different Systems**: Managing data across various incompatible systems can lead to complexities and inefficiencies.
- **Different Data Silos**: Isolated data silos within an organization can obstruct seamless data sharing and analysis.
- **Access Restrictions to Data Tools**: Limitations in accessing data tools can hinder the ability to leverage data effectively.

"It will then also continue in the direction of dealing with dashboard solutions, as analysis at least times and relatively quickly read graphics and know what is in the discussion."
(Interview 5)

Enablers

- **Good Interface**: User-friendly interfaces enhance usability and accessibility, making data tools more effective.
- **Visualization**: Visual representations of data simplify complex information, aiding comprehension.
- **Easy Understandability**: Tools that are straightforward to use empower individuals to work with data more confidently.
- **Investment in Analyzing Tools**: Commitment to investing in advanced data analysis tools can enhance data utilization capabilities.
- **Manage Access Rights and Permissions**: Implementing robust access controls ensures that data is securely and appropriately shared across the organization.

The choice and quality of systems and tools significantly impact data utilization (DeHoratius et al., 2023). Identifying barriers and leveraging enablers in this dimension is pivotal for harnessing data's full potential.

Data

This chapter explores the pivotal role of data in the data utilization process, focusing on the impediments that can hinder progress and the drivers that can facilitate effective data utilization.

"now we have a lot of data available and we don't take as much value as maybe we could"
(Interview 2)

"it's also the case that you can't combine a lot of things, for example. You can't just pull in every attribute and every metric. Sometimes it doesn't fit together" (Interview 7)

Barriers

- **Poor Data Quality**: Data of subpar quality can undermine the reliability of insights derived from it.
- **Low Data Credibility and Data Governance**: Issues in data credibility and governance can lead to skepticism and hinder data utilization.
- **Inaccuracies in Reports and Missing Data**: Inaccurate reports and missing data can derail decision-making processes.
- **Data Utilization Overload**: Overwhelming amounts of data can lead to information overload, making it challenging to extract valuable insights.
- **Integrating External Data**: Integrating data from external sources can present challenges in ensuring accuracy and relevance.
- **Data Matching**: Matching data from various sources can be complex and time-consuming.
- **Complexity of Data Analysis**: Differences in concepts and data sources can make comparing data analysis results difficult.
- **Challenging to Find the Right KPIs**: Identifying the most relevant Key Performance Indicators (KPIs) can be a challenging task.
- **Potential Risk in Data Usage**: The misuse of data can pose risks, necessitating careful handling.

"we don't have specific needs that we want to accomplish with information and data unless we have someone." (Interview 1)

Enablers

- **Setting Clear Use Case and Goals**: Clearly defined use cases and goals provide direction for data utilization efforts.
- **Prediction Models**: Leveraging predictive models can enhance the accuracy and relevance of data-driven insights.
- **Efficient Data Utilization**: Efficient data utilization practices optimize the value extracted from data.

- **Good Data Value Assessment**: Assessing the value of data helps prioritize and focus data utilization efforts.
- **Careful Analysis and Questioning Before Making Conclusions**: A meticulous approach to analysis and decision-making ensures the integrity of insights derived from data.

Data quality and effective data utilization are central to the success of data-driven endeavors. Recognizing and addressing barriers while leveraging enablers in the realm of data is fundamental to leveraging its full potential. This results that challenges in terms of the data overload and the complexity of data analysis received by the interviewees including the clients do act as a barrier. Thus, P3 can be confirmed:

P3*: Challenges and limitations reported by users and stakeholders in relation to REDUNIQ Insights such as the data overload impact the overall effectiveness and value of the data.*

5.3 Environmental factors

Environment

This chapter delves into the external factors within the environment that influence data utilization. It examines the barriers that may impede progress and the enablers that can facilitate it.

> *"It is very important not only because we are able to take at this moment a lot of the KPIs of the business. So occupancy, source markets, revenue revenue per customer. "(Interview 6)*

Barriers

- **Data Privacy Concerns**: A heightened awareness of the significance of data can place additional pressure on data utilization efforts.
- **COVID-19 Increased Data Value Perception**: The pandemic has underscored the importance of data, increased expectations and demands for data-driven solutions.

Enablers

- **More Technologically Focused Study Degrees**: An increased emphasis on tech-focused study degrees propares individuals to harness data's potential effectively.
- **Growing Awareness of Importance of Data**: A growing awareness of data's importance fosters a favorable environment for data-driven decision-making.
- **Increasing Degree of Innovation, especially in Lisbon**: A culture of innovation, particularly in Lisbon, promotes the adoption of cutting-edge data utilization practices.

In summary, the information provided supports the idea that a growing awareness of data's importance and a culture of innovation in Lisbon can foster data-driven decision-making. However, it also aligns with P2 by acknowledging that data security, ethical, and privacy concerns can still hinder the full adoption of retail analytics despite these favorable trends. So P2 could also be validated as true.

P2: Data security, ethical & privacy concerns are hindering companies to adopt retail analytics.

Impact on REDUNIQ Insights

How is that effecting the use of REDUNIQ Insights data? A common thread throughout these segments is the need for a clear understanding of why the organization is collecting and analyzing REDUNIQ Insights data. This ties into having well-defined use cases and specific goals. In summary, the interviews reveal common challenges related to the use of REDUNIQ Insights data, including *clarity of purpose, resource limitations, data overload, complexity in analysis, and data literacy*. Addressing these challenges may require investment in personnel training, data analysis capabilities, and improved communication and collaboration within organizations.

The environmental, organization and technological factors significantly influences data utilization. Acknowledging these barriers and leveraging enablers is pivotal in navigating the evolving landscape of data utilization effectively.

5.4 Product dimensions of REDUNIQ insights customized reports

Q2: What are the current capabilities and features of REDUNIQ Insights, and how do they contribute to its perceived value among users?

To detect and visualize the insights on the capabilities detected from the qualitative interviews from the clients, the findings were categorized in (Figure 11) based on the 7 dimensions of a digital product by EBG Consulting (2012). It helps to identify the product requirement possibilities, build shared understanding of requirements, explore requirements holistically, and collaborate on selecting the highest value options for delivery (Figure 2).

Figure 10: Current state of REDUNIQ Insight customized reports (own presentation)

To assess how they contribute to the value among users it is crucial to understand how the value is exactly created by using the data. For this purpose, the Osterwalder Value Proposition Canvas was used. The Value Proposition Canvas, a strategic tool developed as part of the Business Model Canvas (Osterwalder et al., 2010) provides a structured framework for analyzing and designing value propositions. It consists of two main components: the *Customer Profile* and the *Value Map*. The Customer Profile identifies the jobs, gains, and pains of customers, while the Value Map outlines how a product or service creates gains and relieves pains. The Value Proposition Canvas places customers at the center of strategic considerations. It is designed to understand their needs, desires, and challenges thoroughly.

This approach aligns with the growing importance of customer-centricity in modern business strategies. In the context of this research, the Value Proposition Canvas serves as a foundational tool for dissecting the customized reports provided by REDUNIQ insights. It enables a structured analysis of how these reports align with the jobs, pains, and gains of the retailers and their customers. The utilization of the Value Proposition Canvas in this research enhances the understanding of how data-driven decision-making, facilitated by REDUNIQ insights, impacts the value propositions of retailers. From the interview it could be assess which customer jobs need to be fulfilled and how REDUNIQ insights is helping them.

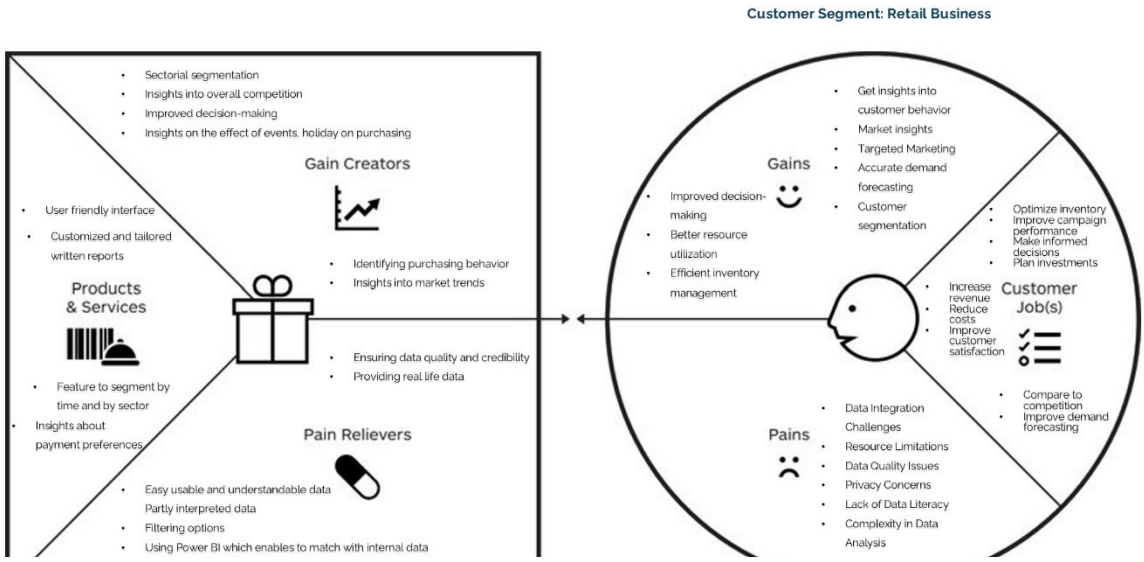


Figure 11: Value proposition model of REDUNIQ Insights based on (Osterwalder et al., 2010)

a.) *How can user feedback and input be effectively integrated into the development and enhancement process of REDUNIQ Insights 2.0 to ensure its continued relevance and value?*

To ensure the continued relevance and value of REDUNIQ Insights, it's imperative to effectively integrate the user feedback and input into the development process of REDUNIQ Insights 2.0. These features contribute to its perceived value among users, as it empowers organizations to make data-driven decisions, identify opportunities, and enhance their competitive edge. From the insights of the Osterwalder Value Canvas and the information from the interviews the most important value for the customer could be extracted illustrated in Figure 12. The figure shows the room for improvement areas by contrasting the value to the customer to the competitive advantage for the company and highlighting the areas for improvement and the strength (Figure 13).

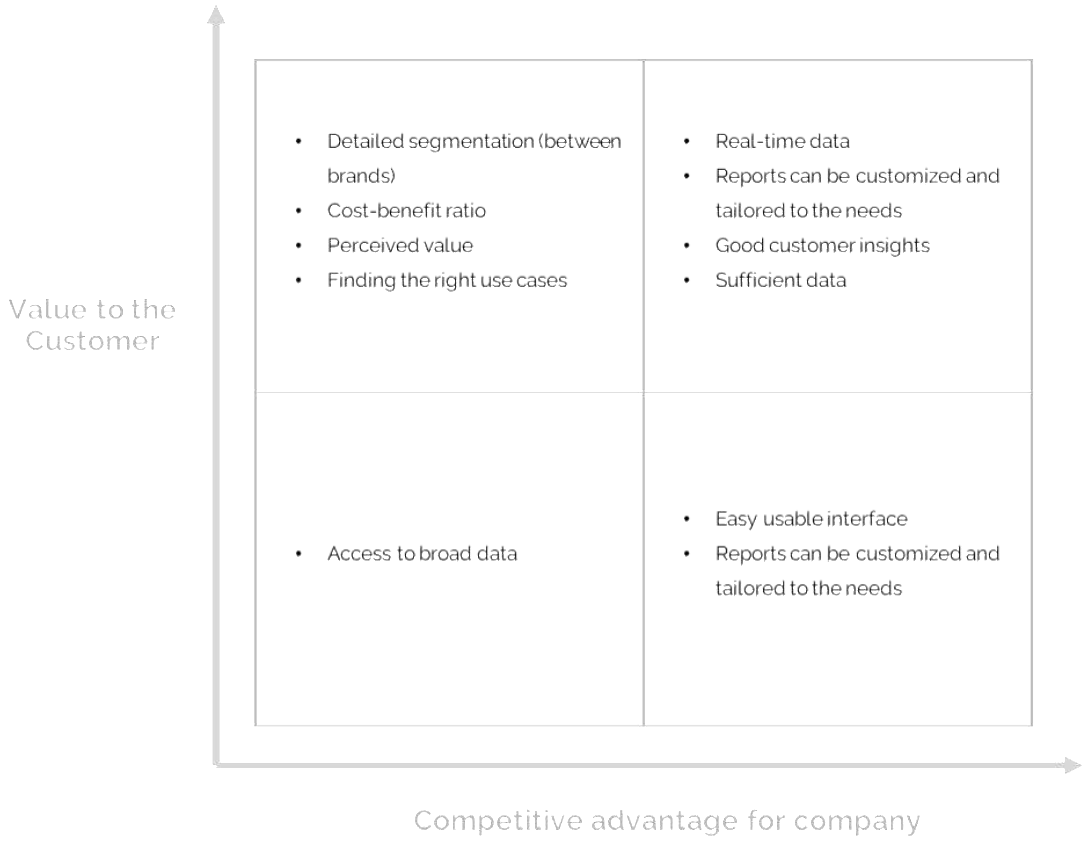


Figure 12: Value vs. competitive advantage based on (Osterwalder et al., 2010)

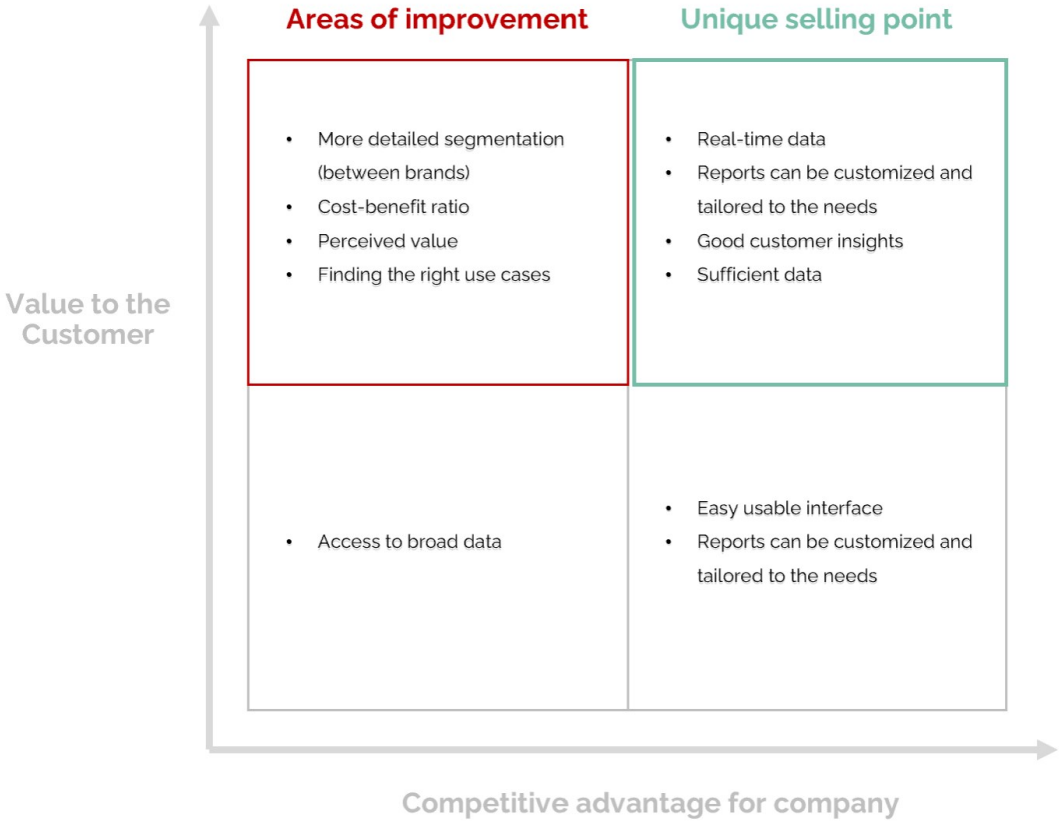


Figure 13: Areas for improvement and unique selling point of REDUNIQ customized reports based on (Osterwalder et al., 2010)

The value for the customer is located in the real-time data and the ability to customize the reports. It offers sufficient data and good customer insights. Areas that should be improved according to the interviews are a more detailed segmentation, an optimized cost-benefit ratio and increasing the perceived value of REDUNIQ Insights data. It is also crucial for the clients to find the right use case for the data.

Q3: How does REDUNIQ Insights impact and shape the decision-making processes of companies operating within the Portuguese retail sector?

From the Osterwalder Canvas model (Figure 11) it can be derived which business decisions are being taken from the use of REDUNIQ insights:

Data-Driven Decision-Making: REDUNIQ Insights helps customers make smarter decisions in concert with internal data and align more closely with market trends and consumer behavior.

Insights into economic impact, occupancy rates, source markets, and revenue per customer play a critical role in developing strategies.

Understanding Consumer Behavior: The data from REDUNIQ Insights customized reports empowers clients to gain a comprehensive understanding of their consumer buying behavior. The data can help them to analyze peak selling hours, transaction volumes, and average transaction amounts. This knowledge enables them to tailor marketing efforts, optimize staffing levels, and align inventory with predicted customer nationalities. It proves invaluable in areas such as inventory management and staff planning.

Economic and Social Impact Assessment: Clients utilize REDUNIQ Insights to assess the economic and social impacts of various factors, including external events like the Ukrainian invasion, COVID-19, and public holidays. This assessment is crucial for explaining the effects of such events on the economy and consumer behavior to authorities and stakeholders. Tourism data provides insights into the value of European tourism in specific centers and distinguishes between foreign and domestic customer spending. This information guides marketing investments and strategic decision-making.

Segmentation and Analysis: The platform allows clients to segment and analyze their markets effectively. They can segment by countries, spending patterns, and monthly trends, providing deeper insights into visitor demographics and preferences. This segmentation aids in tailoring marketing strategies and understanding market dynamics.

Benchmarking and Performance Assessment: REDUNIQ Insights serves as a valuable benchmarking tool, enabling clients to compare their performance with competitors. This comparative analysis informs decision-making and performance assessment, particularly in industries like shopping centers.

Industry Representation: Data generated by REDUNIQ Insights plays a pivotal role in representing industries to stakeholders and authorities. It provides compelling evidence of business performance, economic impact, and industry significance, reinforcing the importance of these sectors in the broader economy. However, the impact is influenced by the challenges and limitations faced by clients, such as the mentioned lack of clear use cases, data utilization overload, and data matching difficulties.

To maximize its impact, REDUNIQ should address these challenges and actively support users in overcoming these hurdles, concluding that P4 can be confirmed:

***P4**: The insights of the customized reports by REDUNIQ Insights influence the decision-making of the company.*

6 Recommendations

This chapter examines the empirical findings of this study and highlights the challenges and opportunities of data use in retail. Through qualitative interviews with a diverse group of retail experts, including REDUNIQ Insights clients, retail analytics experts, and industry practitioners, this study aims to shed light on the impact of data-driven decision making and provide insights for companies seeking a competitive advantage in this evolving landscape. In the following, the research questions will be answered. Based on the information obtained from secondary data from the research of the literature and the primary data from the interviews, measures can be taken for the customized reports of REDUNIQ Insights, which will help to offer a new improved knowledge solution for the customers under REDUNIQ Insights 2.0.

Implement more Segmented Reports

In the pursuit of delivering tailored value to retailers and their customers, one area for improvement is achieving more granular segmentation. Users have expressed a clear need for more detailed segmented and granular reports. To address this, REDUNIQ can consider developing reporting features that provide increased detail and categorization based on the use case of the client. One example for this would be segmentation between brands for outlets or to segment between “sportswear” and reports should allow for in-depth analysis across various dimensions, such as different brands and market segments. By segmenting customers based on their purchase history, preferences, and behaviors, retailers can create highly targeted marketing campaigns. For instance, if a retailer identifies a segment of customers who frequently purchase athletic footwear, they can design promotions and advertisements specifically tailored to this group. Users should have the flexibility to customize reports dynamically, enhancing their ability to derive deeper insights. Enhanced segmentation can lead to a deeper understanding of customer behavior within each brand's customer base. This, in turn, can result in the development of tailored products, services, or marketing strategies that better address the

unique needs and pain points of each segment. Enhanced customization options are vital to align the platform with specific user needs. REDUNIQ can invest in features that allow users to tailor data according to their requirements. Additionally, it can provide advanced forecasting capabilities and offer insights into the impact of events and holidays on user behavior.

Improve Cost Benefit-Ratio

To ensure the long-term viability of data-driven decision-making, it's crucial to continually assess whether the benefits occur from data utilization outweigh the associated costs. To meet users' cost considerations, REDUNIQ should evaluate the cost-benefit ratio of potential enhancements. If feasible, REDUNIQ can negotiate to lower the price for the customized reports as they are individual based or they could offer a reduced fix price. On the other hand, the price can be legitimized by a successful communication of the benefits of the reports and the data.

Assist in Finding the Right Use Cases

Finding the right use cases involves conducting a thorough analysis of the clients' goals, available data, and potential opportunities. As the study showed, this is what most retailers are struggling with. Cross-functional teams can collaborate to brainstorm and prioritize use cases based on factors such as feasibility, impact, and alignment with business objectives. Focusing on the right use cases ensures that data utilization efforts are purposeful and yield meaningful results for the clients. This approach mitigates the risk of investing resources in initiatives that may not generate substantial value for the client, ultimately contributing to more efficient and impactful data-driven decision-making. REDUNIQ Insight could offer a step-by-step guide or framework for helping its clients identify the right use cases.

Building Data Analysis Capabilities

Resource limitations, both in terms of personnel and technology, are hindering efficient data analysis and utilization. This suggests that organizations may need to invest more in data analysis capabilities. Data overload is a challenge, but it can be mitigated by refining the focus on what data is truly valuable for decision-making. Data literacy is uneven across organizations, and there's a need for training and education to bridge the gap. REDUNIQ can consider offering

special training or consultation services to help clients build their data analysis capabilities. REDUNIQ Insights should also try to align with the overall strategy and objectives of client organizations and to discuss their use case in detail before creating the reports. This alignment ensures that data analysis efforts are directly contributing to organizational goals. Due to data complexity, REDUNIQ can assist clients in reframing data effectively. This includes providing guidance on asking the right questions and considering multiple perspectives before drawing conclusions.

Engagement and Feedback Loop

To facilitate effective integration of user feedback constantly, REDUNIQ should establish a continuous feedback loop and engage customers in the development process. This can involve regular surveys, user interviews, and collaboration with key stakeholders to prioritize feature enhancements. Users should feel heard and valued as their input shapes the evolution of REDUNIQ Insights 2.0. In conclusion, integrating user feedback into the development and enhancement process is pivotal for ensuring the continued relevance and value of REDUNIQ Insights. By addressing the specific areas highlighted by users, REDUNIQ can enhance its offering, meet evolving user expectations, and solidify its position as a valuable resource for data-driven decision-making in the Portuguese retail market.

7 Conclusion

The study results have shown that after COVID-19, many retailers are aware of the importance of data and the possibility of correct data utilization. However, many companies still need to improve the use of their data and provide enough trained staff and the analytical skills that are of enormous importance for data evaluation. In conclusion, this study has shed light on the crucial role of data analytics in today's rapidly evolving retail landscape. The findings underscore the growing awareness of data's importance and the increasing degree of innovation for data-driven decision-making. It is evident that the adoption of retail analytics poses several challenges, hindering companies from fully embracing retail analytics. To succeed in this data-driven era, it is crucial for businesses, especially in the Portuguese retail sector, to navigate these challenges effectively. The adoption of data analytics, as exemplified by REDUNIQ

Insights, offers a promising pathway toward achieving competitive advantages and enhancing decision-making processes.

With one statement, everyone was clear - there is enough data, and data is essential. The question is no longer *if* companies use it but *how* and for *what* they can best utilize it.

7.1 Limitations and Future Research

This section discusses the limitations encountered during the study. It's essential to acknowledge these limitations to provide context for the study's scope and findings. As the customized reports of REDUNIQ Insights are a relatively new product, the small sample size of seven participants and the potential for response bias may limit the generalizability of findings. Data saturation determined the sample size, but additional interviews could have revealed further insights. Potential customers from the REDUNIQ network were contacted for interviews, but the language barrier also resulted in a very low response rate. At the same time, a quantitative analysis of all customers for the customized reports was not desired by the customer, as this had already been carried out by the project partner in relation to the infographics. The study also primarily focused on the Portuguese retail and consumer goods market as REDUNI Insight offers insights in the Portuguese markets. While efforts were made to identify broader implications by also interviewing experts from different countries, the findings may have regional-specific nuances that limit their generalizability to other markets. The study relied on qualitative interviews to gather insights. While qualitative research provides valuable in-depth information, a quantitative component could have offered statistical validation of findings. There may be limitations in the validity of interviewee responses, as they are based on self-reported data. Respondents may have provided information that is subject to recall bias or influenced by their perceptions. The data collection occurred within a specific timeframe. Despite these limitations, this study offers valuable insights for REDUNIQ Insights and contributes to the field of retail analytics.

The research further provides several directions for future academic research that take advantage of the availability of big data. One potential future development is using machine learning and artificial intelligence to improve demand forecasting, inventory management, and pricing optimization (Rooderkerk et al.,2022). As the retail landscape evolves, new

opportunities arise through emerging trends and technologies. These include the integration of artificial intelligence (AI) and machine learning (ML) algorithms, real-time data analytics, and the utilization of emerging data sources (Accenture, 2022). Retailers can leverage these advancements to gain deeper insights, make more accurate predictions, and adapt quickly to changing customer demands. Finally, the study highlights the importance of addressing practitioners' challenges when adopting advanced analytics. Future research could develop strategies for overcoming these challenges and ensure that practice can readily implement research findings. Future research could also include conducting similar studies in different regions or countries to compare the challenges and opportunities retailers face in different international contexts. This would provide a more comprehensive understanding of global trends. Conducting more in-depth industry-specific studies within the retail sectors can offer tailored recommendations that address the unique challenges of different sub-industries.

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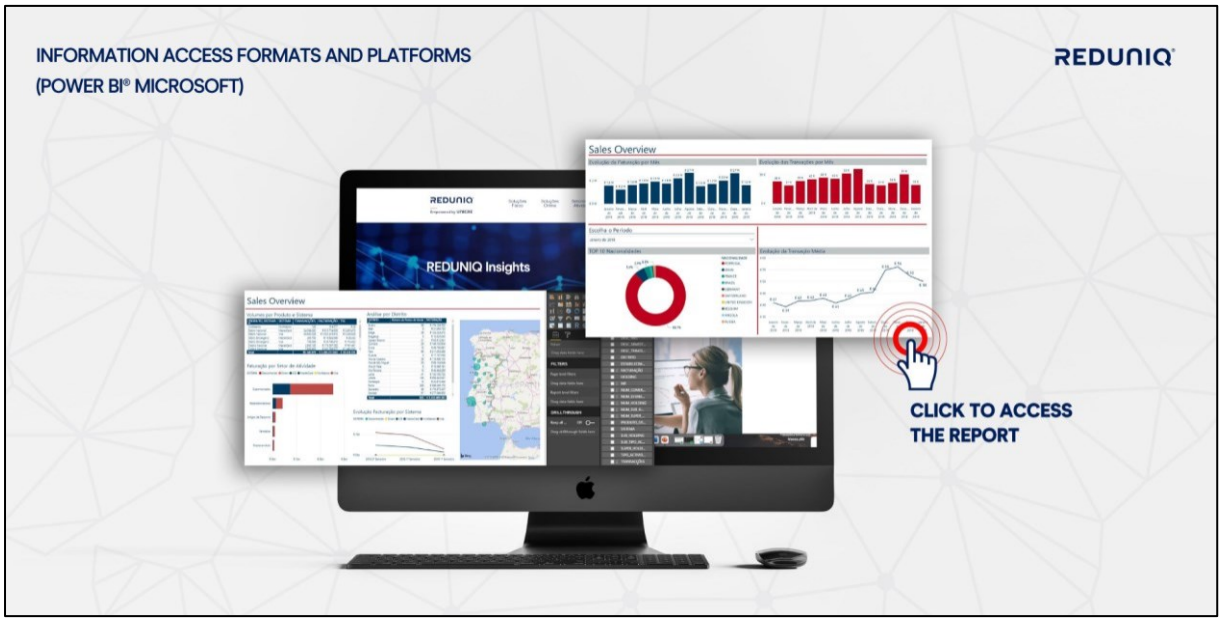
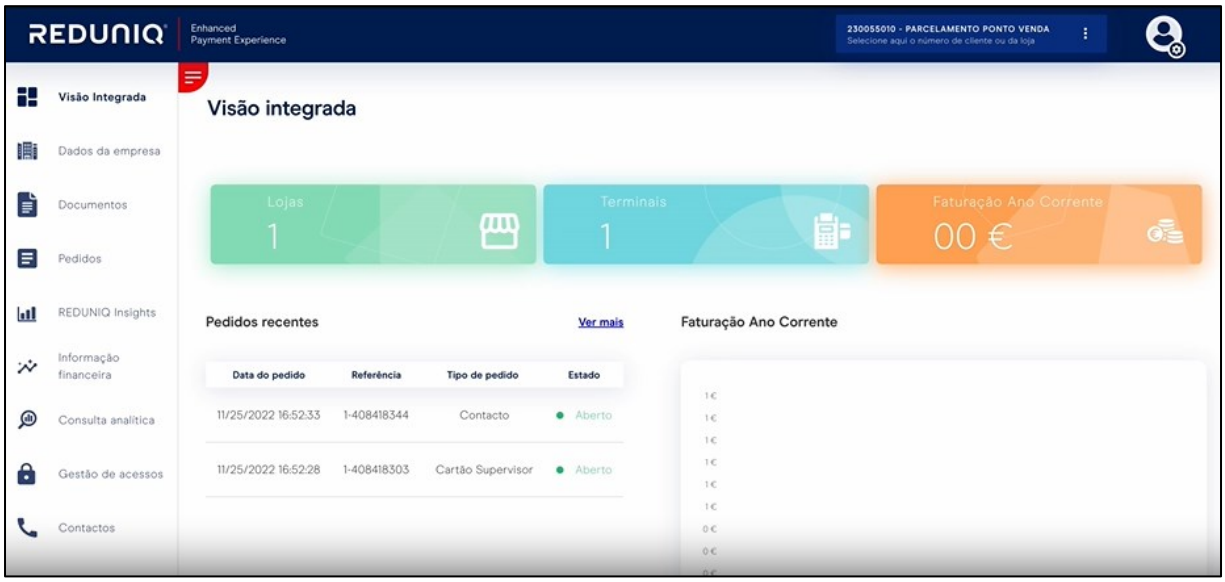
Appendices

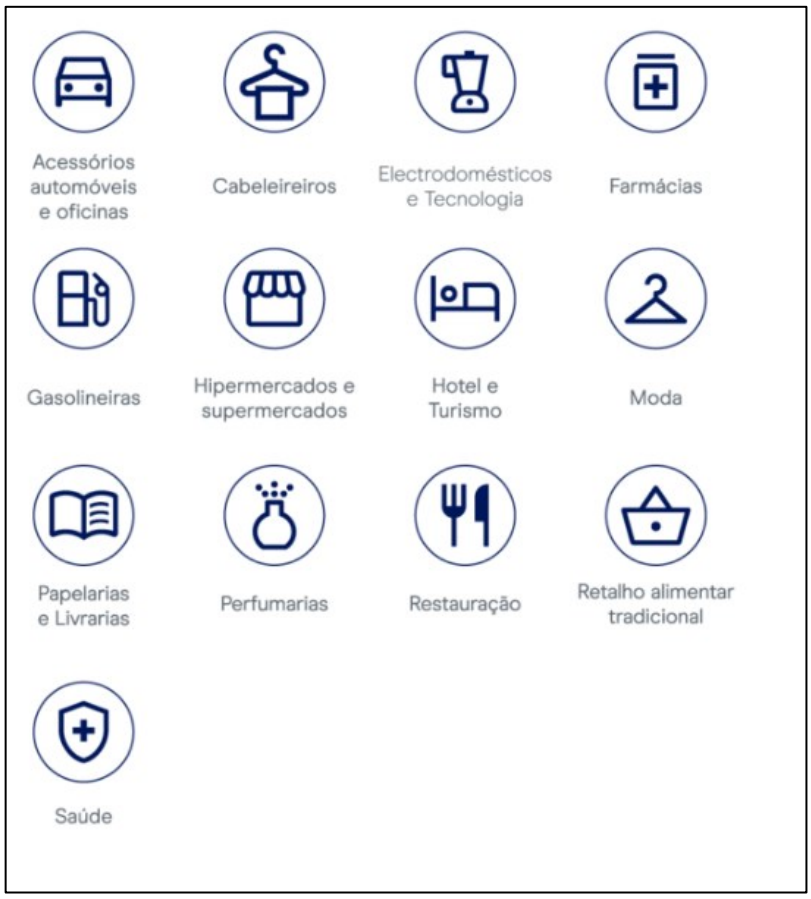
Appendix A – REDUNIQ Insights



Appendix A 1: REDUNIQ Insight Interface



Appendix A 2: REDUNIQ Insight Platform



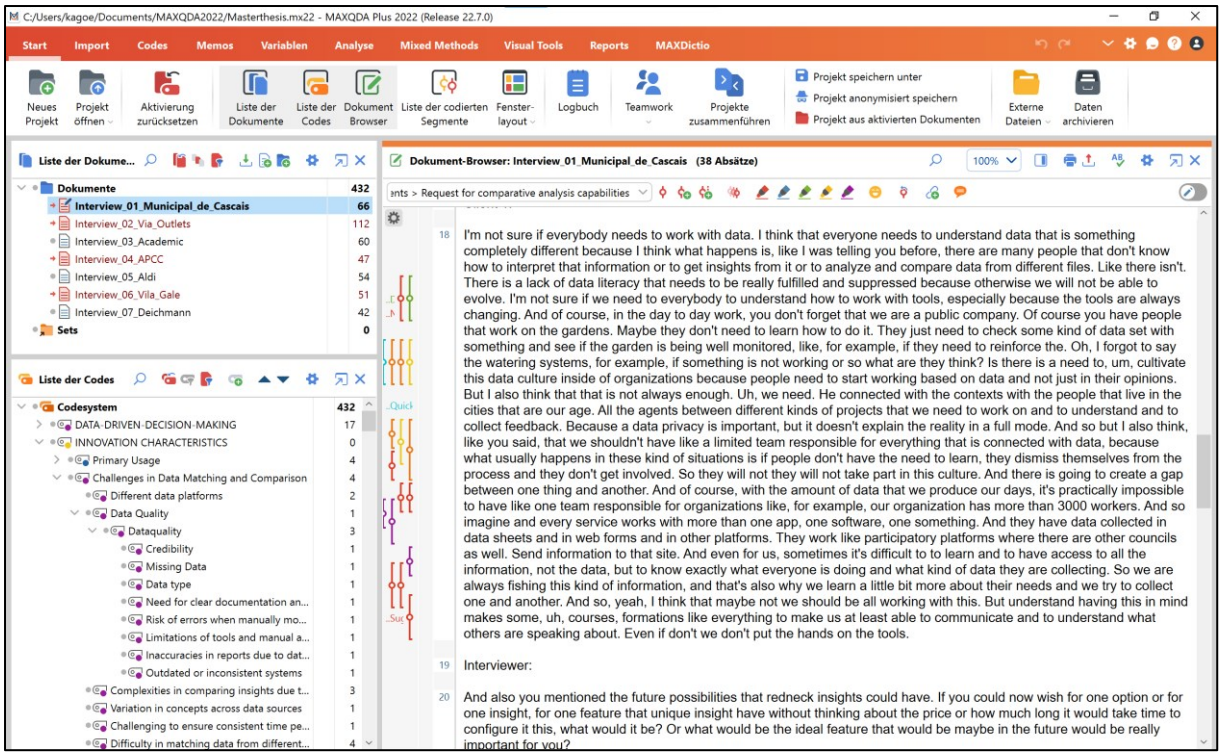
Appendix A 3: REDUNIQ Insight Sectors

Appendix B – MAXQDA

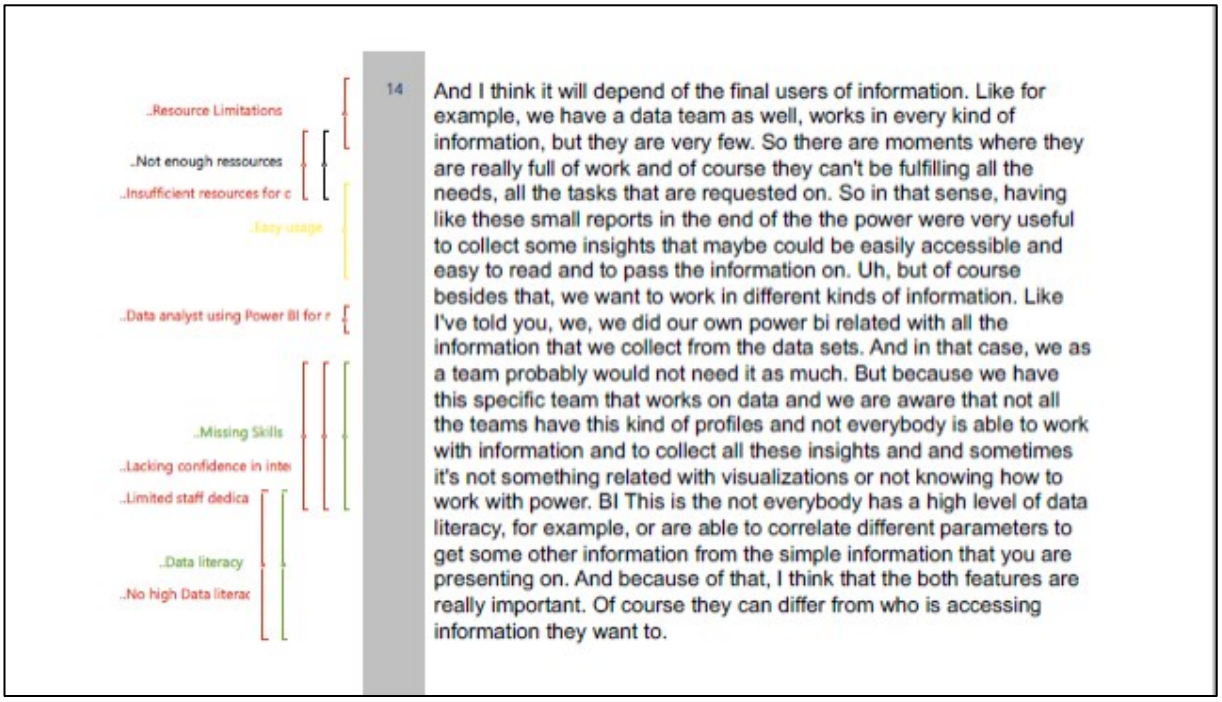
Appendix B1: Coding framework from Interviews

No	Factor	Category	Codes	Example References	Occurence
1	T	Amount of data	Data Utilization Overload	*"So, we built so much on our reports* ***that now we have a lot of data available,*** *and we don't take as much value as maybe we could." (Interview 2); "because the data,* ***it's been increasing a lot"*** *(Interview 6)*	**13**
2	T	Infrastructure	Different data silos	*"And there the challenge is not only the technology itself,* ***but the different data silos that exist*** *because their data is stored in there." (Interview 5)*	2
3	T	Interface	Easy readability of data and using the solution	***"We can read very easily****. So the dashboard in Power BI. it is very easy, and I can say and very good for the user."*	**6**
4	T	Interpretability of Data	Lacking in finding the right use case	*"And normally we want to base our decisions on data, but sometimes it's difficult* ***for us to make sure that we are doing the right readings****, that we are looking at the right KPIs or the right data sets just to make sure that we are using the correct things."*	**9**
5	T	Compatibility of data	Difficulty in matching data	*"Now with us in digital, it's also the case that* ***you can't combine a lot of thing****s, for example. You can't just pull in every attribute and every metric. Sometimes it doesn't fit together and then something wrong comes out and you have to know very precisely what you can use and how and why it might not have worked now." (Interview 7)*	4
6	T	Complexity of data	Challenges in analyzing complex data	*"To our main worries where we need to collect data, we need to start working on the data, put up the information and organize the information, getting the information" (Interview 6)*	3
7	T	Data Segmentation	Need for more segmented reports	*"o at least breaking down into brands or breaking it down into brand segments. So not having just the general value of our business." (Interview 2), "I think that the reports could be more segmented."(Interview 2)*	**8**
8	T	Data Quality	Challenges in assuring data accuracy and reliability	*" But the merchandise management system, for example, is perhaps totally outdated and these are perhaps I don't know the articles or so, are still built on an old turnover or not cleanly built and if you then just make evaluations with it, it will just not be so meaningful or* ***just always brings certain errors with it around****." (Interview 5)*	5
9	t	Customization	More customized data	*"all the information and make* ***it more suitable for what people maybe would need.****" (Interview 2), "probably could go* ***into more detail"*** *(Interview 6), "more comparative analysis"(Interview 02)*	2
10	T	Value of Insights	High Value of information for the company	*"For us* ***very important information to collect*** *and to explain what we have to do for the market" (Interview 4) "and we don't take as much value as maybe we could"(Interview 2)*	2
11	O	Data Integration	Complexities in comparing insights due to differing bases	*"and it's one of our* ***difficulties is to make sure that we are comparing the same time period and the same formulations of the data****." (Interview 2)*	**6**
12	O	Cost-time effort	No sufficient cost-benefit ratio	*"I'm not going to say that it was not relevant.* ***But when I looked at the cost that it was involved for something that it's nice to have, but it's not crucial for my business*** *or for my decisions." (Interview 6)*	1
13	O	Resource limitations	Need for building analytical capabilities	***"We will probably need more people to analyze the data"*** *(Interview 6); "As a company, you also* ***need the resources to really act*** *on it in real time." (Interview 7) "that's where I think* ***we have a lack of resources"*** *(Interview 6).*	5
14	O	Culture	Creating a supportive culture	*"There is a need to, um,* ***cultivate this data culture inside of organizations*** *because people need to start working based on data and not just in their opinions." (Interview 1)*	**6**
15	O	Data Literacy	Different levels of data literacy	***"Not everybody has a high level of data literac****y" (Interview 1); "There is a* ***lack of data literacy*** *that needs to be really fulfilled" (Interview 1)*	5
16	O	Human resources	Resource limitations	*"We have this specific team that works on data, and we are aware that* ***not all the teams have this kind of profiles and not everybody is able to work with information"*** *(Interview 4)*	4
17	O	Roles & Responsibility	Analyzing data is not the main responsibility	*"We shouldn't have like a* ***limited team responsible for everything*** *that is connected with data" (Interview 1)*	2
18	O	Management support	Leadership commitment	*"This data-driven thing that we have,* ***it's actually led by our director*** *because he's very data-driven and anytime that we have." (Interview 2)*	4
19	O	Technological readiness	Readiness to adopt and use data	*"We were already we're already on in the* ***data path****." (Interview 1)*	4
20	O	Workflow Between Teams	Different languages between teams	*"So marketing department* ***speaks a completely different language than we do****. The department and marketing is then very quickly once spoken of personas. But what this means in the technical area and how to implement it is another question." (Interview 5)*	4
21	E	Internal data governance	Growing awareness and readiness for data adoption	*"But you notice that* ***it gets more and more attention"*** *(Interview 5)*	4

25	DDDM	Evolution of Data Importance	Anticipated technological developments	*"You can notice that **it gets more attention**" (Interview 5)*
26	DDDM	Data security, ethical & privacy concerns	Growing Data security and privacy concerns	*"My personal experience is that the big groceries in particular **take the issue very, very seriously** because they are also a bit of a target." (Interview 5)*
27	DDDM	Future Trends	Predicitons & Forecasting	***"In the future they will have predictive models** where they can say, okay, because your company had this historical behavior, you can expect that. So that's our view on this on this, the future for this kind of data partners." (Interview 2)*
28	DDDM	Data availability	Data is not always accessible	*"Because I can only say about us know that, for example, **they were not so strongly restricted in the past**." (Interview 7)*
29	DDDM	Account management	Long term relationships	*"Are at least three years, 3 or 4 years. I don't recall the first time that we start working with them, but **it's been a long-term relationship.**"*
30	DDDM	Regional variations	Different adoption of data	*"But what we have is **different velocities working on in our country** and in different kinds of organizations. (Interview 1)"*
31	DDDM	Business Model Evaluation	Optimizing Internal processes	*"So, it allows us to take **better decision**s. First of all, more informed decisions and second of all, **much more quickly**." (Interview 6)"*
32	DDDM	Business Insights	Analyzing internal performance	***"So, occupancy, source markets, revenue per customer**. So, the data is very important to analyze our KPIs and the **performance** (Interview 6)"*
33	DDDM	Data-Driven-Decision making	More Informed decision	*"Because in my opinion, decisions are simply better based on data, as if it were somehow subjective or based on gut feeling." (Interview 7)*
34	DDDM	Marketing	Personalized marketing campaigns & promotions	*"That is very helpful for our strategy, not only in terms of, for example, **investments in marketing communication** outside our country, but also to inform our brands what they need to be prepared for." (Interview 2)*
35	DDDM	Supply Chain Management	Cost savings along supply chain	*"What are energy costs in the certain country for the machine that makes it all? What are **transport costs**... And apart from that and derived from it, we can estimate approximately how the price can be influenced."*
36	DDDM	Operations	Adjusting staffing levels	*"The **number of people in the stores** because we tell them what the prediction for the next month in terms of number of visitors and they is also manage the team taking that into account" (Interview 2)*
37	DDDM	Sales	Planning sales data	***"Plan very precisely on a rolling monthly basis**, how much sales do we make?" (Interview 7)*
38	DDDM	Product Management	Identifying product trends	*"it is also very important, um, to try to adjust our strategies in order to **develop new products** so we are able to collect nowadays the opinions of our guests (Interview 6)*
39	DDDM	Strategy	Optimizing Pricing Strategies	*"**Pricing**, etc., about reductions. Tools are already being developed that calculate the day on which we have to reduce by one percent more in order to achieve our goals, but they are not sufficient." (Interview 7)*
40	DDDM	Benchmarking	Performance against competitors	*"Competition of .... could buy to know how much customers and users has." (Interview 3)*
41	DDDM	Predictive Modelling	Demand forecasting	*"So the data is very important to analyze our KPIs and the performance, the historical data. **It's also important to do some forecast**" (Interview 6)*
42	DDDM	Inventory management	Optimizing stock levels	*"do it a lot **with stocks**. For example. They try to **manage stocks accordingly** to the nationalities that are coming in the next months." (Interview 2)"*



Appendix B 2: MAXQDA Interface



Appendix B 3: Coding Process Interview

Appendix C – Interview Scripts

INTERVIEW SCRIPT

INTRO

My name is Kathrin Göbel and I'm a Master Student at Católica Lisbon. For my Master Thesis I am currently conducting research on the use of data analytics in the retail sector based on the example of REDUNIQ Insights.

The focus of my thesis is to evaluate the current impact and application of data analytics in the retail business in cooperation with REDUNIQ insights. The aim here is to investigate how retailers are currently using data and how they can make use of transaction data in the future.

As a customer of REDUNIQ, your perspective is incredibly valuable to this research. I am interested in hearing about which role retail analytics has on your business and how it has may impacted your decision-making processes within your company.

During this interview, we will be discussing a range of topics related to the use of data and the challenges and possibilities that come with it, and the impact it has had on your business.
Before we begin, I want to assure you that your responses will be kept confidential, and your name will not be associated with any of the information you provide.

QUESTIONS

1. Can you introduce yourself with your role in the company?
    2. How exactly is retail analytics or data used in your area?
    3. What types of data does your company collect and how is that data managed and analyzed?
    4. Which business areas are particularly involved here?
    5. Would you say that there are enough resources in your company and that the area is given enough importance?
    6. What role does collaboration between different departments or teams in your company play in using retail analytics and adapting processes?
7. Can you share some examples where retail analytics has helped align processes in your organization?
    1. What other strategic considerations and decisions are made in your company based on the findings from retail analytics?
    2. What specific challenges existed when implementing retail analytics in your company and how were they overcome?
    3. How do you measure the success and effectiveness of retail analytics initiatives in terms of process alignment?
    4. How has your company's use of retail analytics evolved over time?
    5. To what extent is corporate culture related to the use of data?
    6. Which opportunities do you see in retail analytics in the future for your business?

CLOSING

Thank you for taking the time to participate in this interview. Your insights and perspectives have been extremely valuable and will be instrumental in informing the research for my thesis. If you have any additional thoughts or feedback about it please feel free to share them with me.
Finally, I want to reiterate that your responses will be kept strictly confidential and will only be used for the purpose of this research. If you have any questions or concerns about the research process, please don't hesitate to reach out to me.
Once again, thank you for your time and contributions. Your input is greatly appreciated.

Appendix C 1: Interview Script Retaile

Interview Script

INTRO

Thank you for taking the time to speak with me today. My name is Kathrin Göbel and I'm a Master Student at Catolica Lisbon. For my Master Thesis I am currently conducting research on the use of data analytics in the retail industry based on the example of REDUNIQ Insights.

The focus of my thesis is to evaluate the current value proposition of REDUNIQ Insights and identify opportunities for improvement to achieve REDUNIQ Insights 2.0.

As a customer of REDUNIQ Insights, your perspective is incredibly valuable to this research. I am interested in hearing about your experience and how it has impacted your decision-making processes within your company.

During this interview, we will be discussing a range of topics related to your use of REDUNIQ Insights, including your initial decision to acquire it, the types of insights you have gained, and the impact it has had on your business.

Before we begin, I want to assure you that your responses will be kept confidential, and your name will not be associated with any of the information you provide.

QUESTIONS

1. Can you tell me a little about your business and your role within it?
2. How important is data analysis for your business?
3. How did you first hear about REDUNIQ Insights, and what led you to start using the product?
4. What are the primary ways you use and how often do you use REDUNIQ Insights?
5. What are the most valuable insights you have gained from using REDUNIQ Insights and what value do you believe REDUNIQ Insights provides to your business?
6. How has using REDUNIQ Insights impacted your decision-making process?
7. Which departments are using it, and do you have enough resources to handle the data from the reports?
8. How easy is it to use REDUNIQ Insights? Are there any challenges or frustrations you have experienced?
9. What additional features or capabilities would you like to see added to REDUNIQ Insights that could better meet your needs?
10. In your opinion, what are the strengths and weaknesses of REDUNIQ Insights' customized report offering?
11. Have you compared the customized report from REDUNIQ Insights with similar offerings from other data analysis platforms? If so, how does it compare in terms of quality and relevance?
12. Have you recommended REDUNIQ Insights to others? If so, what did you tell them about the product?
13. How do you see the use of data analytics like REDUNIQ Insights evolving in the retail industry in the future?
14. Finally, is there anything you would like to share about your experience using REDUNIQ Insights or data analytics in the retail industry?

Appendix C 2: Interview Script REDUNIQ Insight Client

Appendix D – Interview Summaries

Section	Summary
Introduction and Role	The interviewee, identified as a member of the Department of Innovation and Marketing, serves as an internal consultant for various city services, including facilitating collaboration between external companies and internal departments, data analysis, visualization, and data sharing. (Interview_01, Pos. 1-11)
Data Application	Initially, the department lacked specific objectives when acquiring data services. They focused on exploring the potential applications of the data, experimenting to answer questions related to events, economic impacts, and more. (Interview_01, Pos. 12-29)
Valuable Features of Data	The value of data features depends on the needs of end-users. Small, easily comprehensible reports with accessible insights were highly valuable, particularly for the data team. The interviewee emphasized bridging the data literacy gap within the organization. (Interview_01, Pos. 30-43)
Data Literacy	The interviewee stressed the importance of data literacy within organizations, highlighting the need for understanding data for informed decision-making, regardless of direct tool usage. (Interview_01, Pos. 44-61)
Future Insights and Features	Future possibilities discussed included understanding user behavior in specific scenarios and creating user profiles and behavioral patterns to enhance project funding applications. (Interview_01, Pos. 62-79)
Competition and Data Providers	A previous experience with another data provider was mentioned, but it was not considered direct competition due to differences in data granularity. (Interview_01, Pos. 80-97)
Data-Driven Initiatives	The interviewee discussed the progress of data-driven initiatives in the region, acknowledging varying levels of readiness among different organizations. The pandemic accelerated data adoption in some areas. (Interview_01, Pos. 98-118)
Conclusion	The interview concluded with an emphasis on the importance of embracing data and digital transformation within organizations, with a focus on building data literacy and informed decision-making. (Interview_01, Pos. 119-128)

Appendix D 1: Interview 1

Section	Summary
Introduction and Role	Interview 2 introduced their role as an employee responsible for CRM and marketing data related to outlet centers in Portugal. (Interview 2, Pos. 1-18)
Duration as REDUNIQ Customer	Interview 2 mentioned that they have been a REDUNIQ customer for at least three to four years, emphasizing a long-term relationship. (Interview 2, Pos. 19-25)
Frequency of Using REDUNIQ Insights	REDUNIQ Insights is used on a monthly basis for reporting KPIs and obtaining insights. (Interview 2, Pos. 26-35)
Valuable Insights from REDUNIQ	The most valuable insights gained from REDUNIQ Insights are related to European tourism, including spending, nationality, and visiting patterns of tourists in their centers. This information guides their marketing and brand strategies. (Interview 2, Pos. 36-63)
Challenges in Using Data	Challenges initially included understanding the data sources and ensuring unbiased analysis. Over time, they have built extensive reports, but the challenge now is to extract the most valuable insights due to limited resources and complex data comparisons. (Interview 2, Pos. 64-98)
Desired Features and Capabilities	Interview 2 suggested more segmentation in reports, especially by brands and product segments, and greater flexibility for comparative analysis. (Interview 2, Pos. 99-116)
Internal Data Management	Interview 2 explained that they collect data from various sources, including their loyalty program, and use Power BI for internal data analysis. (Interview 2, Pos. 117-139)
Sharing Data with Brands	They share insights from REDUNIQ Insights with brands and retailers, especially related to stock management and team planning. (Interview 2, Pos. 140-157)
Competition and Data Providers	While Interview 2 mentioned SIBS Analytics as a potential competitor, they are still investigating its offerings. (Interview 2, Pos. 158-171)
Recommendations for REDUNIQ Insights	Interview 2 recommended REDUNIQ Insights, highlighting its role as an early data provider and their ability to personalize reports. They also praised the relationship with their account manager. (Interview 2, Pos. 172-187)
Importance of Retail Analytics	Interview 2 emphasized the importance of data-driven decision-making in their data-centric company. They believe retail analytics will become more predictive in the future, aiding strategic decisions. (Interview 2, Pos. 188-213)
Challenges in Managing Data	Interview 2 discussed the challenge of having the right staff and resources to work with the increasing amount of data. They are slowly investing in data tools but currently prioritize other aspects of their business. (Interview 2, Pos. 214-238)
Company Culture and Data Use	The company culture is data-driven, led by their director, who values data-driven decision-making. Data is essential for all their decisions. (Interview 2, Pos. 239-258)
Impact of COVID-19 on Data Usage	Interview 2 mentioned that COVID-19 provided an opportunity to focus more on data due to increased free time. While not directly related to the pandemic, it allowed them to enhance their data analysis efforts. (Interview 2, Pos. 259-273)
Predicting Sales for Events and Holidays	They use data to predict sales for events and holidays, helping in communication and inventory management decisions. (Interview 2, Pos. 274-290)
Importance of Additional Data	Interview 2 expressed the importance of additional data, especially segmented by brand and product segments, for benchmarking and deeper insights into market trends. (Interview 2, Pos. 291-312)
Sharing Data with Partners	Brands partner with them to utilize the insights, particularly in stock management and staff planning. It's an additional service they offer. (Interview 2, Pos. 313-331)

Appendix D 2: Interview 2

Section	Summary
Predictive Analytics Challenges	Discussion on challenges in predictive analytics. Mention of the difficulty in considering all relevant parameters.
Sales Planning Implications	Discusses how changes in parameters like average selling prices can impact sales planning. Highlighted the challenge of justifying sales plans.
Using External Data	The potential benefits of using external data sources, including transaction and payment data, are discussed. Reference to using data for marketing during events like Black Friday.
Resource Limitations	Challenges related to resource limitations for implementing real-time data analysis and expanding teams.
Data Security	Mention of data security in the company, indicating that there are no specific training programs.
Measuring Data Effectiveness	Question raised regarding how data utilization effectiveness is measured. Explanation of the complexity of attributing outcomes directly to data usage.
Future Data-Driven Approach	Optimism expressed about the future becoming more data-driven and measurable.

Appendix D 3: Interview 3

Section	Summary
Introduction and Background	In this interview, the interviewee, associated withl, discusses their collaboration with REDUNIQ Insights since the beginning of 2021. They emphasize the importance of data analytics in understanding consumer behavior within the shopping center industry. (Interview 4, Pos. 1-24)
Purpose of Using REDUNIQ Insights	The primary purpose of using REDUNIQ Insights is to develop studies, gain insights, and create a comprehensive perspective of consumer behavior within shopping centers. This data serves various purposes and aids decision-making. (Interview 4, Pos. 25-48)
Frequency of Using REDUNIQ Insights	REDUNIQ Insights is utilized on a monthly basis to gather sales and consumer data, which is crucial for understanding trends, behavior, and performance within shopping centers. (Interview 4, Pos. 49-63)
Ease of Use of REDUNIQ Insights	The interviewee finds REDUNIQ Insights user-friendly, particularly praising the ease of reading and interpreting data through its dashboard in Power BI. No specialized skills are required to use the platform effectively. (Interview 4, Pos. 64-91)
Desired Additional Features	Regarding additional features, the interviewee expresses contentment with the current offering of REDUNIQ Insights. They do not see the need for further features, as the existing data satisfies their requirements. (Interview 4, Pos. 92-112)
How They Came Across REDUNIQ Insights	The interviewee mentions that a former director introduced REDUNIQ Insights, and it was subsequently approved by the board. They haven't explored other data providers as they are content with their current solution. (Interview 4, Pos. 113-136)
Recommendations to Other Companies	The interviewee suggests that other companies and retailers could benefit from REDUNIQ Insights, primarily due to its ability to provide location-specific data related to sales within shopping centers. It allows for benchmarking and trend analysis. (Interview 4, Pos. 137-168)
Importance of Data Analytics in Business	Data analytics is considered highly important for business, especially in the context of the retail industry. Understanding consumer behavior, trends, and preferences through data analysis is essential for making informed decisions and achieving business objectives. (Interview 4, Pos. 169-189)
Impact of COVID-19 on Data Importance	The interviewee acknowledges that COVID-19 has raised awareness of the importance of data. It has highlighted the value of data in adapting to changing circumstances and making strategic decisions. (Interview 4, Pos. 190-209)
Role of Data Security and Privacy	Data security and privacy are regarded as vital, and individuals expect their personal information to be protected. Complying with data protection regulations is essential for building trust with customers. (Interview 4, Pos. 210-238)

Appendix D 4: Interview 4

Section	Summary
Background	The interviewee he has been working with in Global Sourcing, responsible for analytics related to long-term consulting projects focusing on supply chain efficiency, financial aspects, and sustainability.
Challenges in Data Analytics	Handling large volumes of data efficiently, including transitioning from on-premise databases to cloud-based solutions. - Integrating data from various silos into a single platform for analysis. - The need for a diverse skill set that combines technical expertise with business understanding, which is unique to this field.
Training for Working with Data	Excel proficiency is essential for office jobs. - Dashboard solutions and basic data analysis skills are becoming increasingly important. - Advanced technical skills require specialized training or self-education. - Training is crucial due to the risk of errors, especially in data definition.
Collaboration Across Departments	Collaboration is challenging, especially in reporting and requirement engineering. - Translation and understanding of different departmental languages can be a barrier. - Product owners or project managers play a key role in bridging the gap between technical and business teams.
Resource Allocation and Attention	Larger companies are recognizing the importance of data analytics but may prioritize hiring more people over creating scalable solutions. - The focus on scaling and automation is becoming more apparent. - Culture and company history may affect resource allocation and attention to data analytics.
Impact of Company Culture	Company culture plays a crucial role in how data is used and analyzed. - Creating a culture that welcomes both introverted and extroverted individuals is important. - Traditional or conservative cultures may hinder technical people from thriving.
Evolution of Retail Analytics	The shift from descriptive analytics to predictive analytics is significant. - Predictive analytics relies on a strong foundation of historical data. - Projects often require quick iterations due to the fast-paced nature of the retail industry. - Finding a balance between detailed analysis and actionable insights is essential.
Importance of Predictive Analytics	Predictive analytics is central to many aspects of retail, including product recommendations, demand forecasting, and customer engagement. - It helps in making informed decisions about pricing, promotions, and inventory management.
Data Analytics and Sustainability	Data analytics will play a critical role in sustainability efforts in the retail industry. - Regulations and consumer expectations are driving the need for transparency and accountability. - Analyzing the carbon footprint of products and assessing supply chain efficiency are key areas of focus.
Data Privacy and Training	Large retailers take data privacy seriously and invest in employee training. - Some companies may be overly cautious due to legal and ethical concerns. - Training includes awareness of privacy regulations and data handling best practices.
Future of Data Analytics	Data analytics will continue to be essential for cost management and optimization in supply chain and procurement. - Focus on sustainability, human rights, and environmental impact will grow. - Digitalization and marketing will also be critical, especially for competition and customer engagement.

Appendix D 5: Interview 5

Section	Summary
Predictive Analytics Challenges	Discussion on challenges in predictive analytics. Mention of the difficulty in considering all relevant parameters.
Sales Planning Implications	Discusses how changes in parameters like average selling prices can impact sales planning. Highlighted the challenge of justifying sales plans.
Using External Data	The potential benefits of using external data sources, including transaction and payment data, are discussed. Reference to using data for marketing during events like Black Friday.
Resource Limitations	Challenges related to resource limitations for implementing real-time data analysis and expanding teams.
Data Security	Mention of data security in the company, indicating that there are no specific training programs.
Measuring Data Effectiveness	Question raised regarding how data utilization effectiveness is measured. Explanation of the complexity of attributing outcomes directly to data usage.
Future Data-Driven Approach	Optimism expressed about the future becoming more data-driven and measurable.

Appendix D 67: Interview 6

Section	Summary
About the Business and Role	The interviewee is introduced as the CEO of a hotel chain with 40 properties in Portugal and Brazil. They mention their expansion plans and key markets.
Importance of Data Analytics	Data analytics are deemed crucial for the business, enabling the analysis of key performance indicators (KPIs), customer opinions, and product development. Data informs most decisions, including investments and product features.
Evolution of Data Importance	The importance of data has grown significantly over the years, transitioning from manual data collection to automated systems. This allows for quicker and more informed decision-making based on historical and real-time data.
How REDUNIQ Insights Was Adopted	REDUNIQ Insights was introduced to the interviewee by the REDUNIQ team, and they decided to try it out, primarily attracted by the ability to collect transaction data and compare it with the competition.
Frequency of Using Strategic Insights	Initially, the interviewee used REDUNIQ Insights on a monthly basis to monitor market trends. However, they later discontinued using the service.
Reasons for Discontinuing REDUNIQ Insights	The decision to stop using REDUNIQ Insights was primarily due to cost considerations. The data provided was considered "nice to have" but not crucial for decision-making. Limited resources also played a role in discontinuation.
Desired Features or Capabilities	If the cost were lower, the interviewee might consider using REDUNIQ Insights again. They suggest that more detailed data regarding transaction sources could make the platform more appealing.
Weaknesses and Strengths	The interviewee did not identify significant weaknesses in the customized reports but mentioned that the platform's usability was good. They appreciated the clarity of the reports.
Data Resources and Future Needs	The interviewee acknowledged the need for more human resources for data analysis. Collecting data has become efficient, but the challenge lies in using the data to propose actions and make informed decisions.
Forecasting Future Trends	Forecasting is challenging, with predictions limited to approximately one year due to the dynamic nature of the hotel industry. The interviewee relies on common sense more than data for longer-term predictions.
Conclusion	The interview concludes with a reflection on the possibility of revisiting REDUNIQ Insights in the future and an acknowledgment that their team may not have dedicated enough time to explore its full potential.

Appendix D 7: Interview 7