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How does Business intelligence & analytics create business value and facilitate ambidexterity?

A case study in the Swedish online retailing industry

Master's thesis in Management and Economics of Innovation

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Abstract

Several tools and methods have arisen in the last decade to leverage data, where business intelligence and analytics have become commonly used by companies and significantly in the online retailing industry. The online retailing industry stands out with its immense growth and access to data on customers, competitors, and products, making it possible to find and create value from data with a relatively low initial investment. Business analytics and intelligence is a fast-evolving field in which earlier studies on value appropriation have primarily been conducted in Spain and the US, outside the online retailing segment. Thus, the Swedish online retailing market is previously unexplored and could be especially interesting to study, as the country is viewed as an IT frontier.

A business is bound to include activities to create value for the present and the future by innovation and continuous improvement to survive, and these processes can be reinforced with business intelligence and analytics. However, how value is appropriated through business intelligence and analytics is sparsely covered and needs further examination. This paper aims to expand the knowledge on how value is appropriated through BI&A. Further, the paper aims to investigate whether and how BI&A can assist continuous improvement and innovation by supporting ambidexterity and its exploitation and exploration processes by studying the online retail market in Sweden.

A qualitative methodology was adopted in which 14 different online retailing companies operating in Sweden have been interviewed, along with two experts in online retailing. The study identified improvements in operational efficiency, increasing sales, and competitiveness of the business as three main areas of value appropriations gained from business intelligence and analytics. The paper presents vast examples of how value is created and appropriated through business intelligence and analytics in these three main areas and are highlighted in the results. Our findings and discussion present how value is created, not only in the online retailers' specific functions but gives a holistic view of how business intelligence and analytics support value creation throughout the organization. Further, our findings suggest that business analytics and intelligence improve the ability to achieve ambidexterity by supporting explorative and exploitive activities with, for example, methods and tools such as designing and aligning KPIs, and A/B testing, influencing the mediating factors of interconnectedness and cross-functional interfaces.

Keywords: Business intelligence and analytics, online retailing, ambidexterity, competitive advantage, dynamic capabilities

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Oscar Thornander

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1
Introduction

The B2C online retailing market in Sweden is experiencing substantial growth (Statista, 2020), and many traditional retailers are refining their business model to include the online segment with an omnichannel structure. Thus, the growth is coupled with increased competition domestically and by new market entry from platform-based marketplace giants, such as Amazon (Piotrowicz & Cuthbertson, 2014). To survive in a market that experiences substantial competition, firms need to innovate in their existing business areas and have the ability to catch new market opportunities early (Dereli, 2015). Grewal et al. (2017) describe the importance for retailers of using big data and analytics to increase their competitiveness to handle the trends and increased competition.

Using data has had an increasing interest in almost all industries for the last decades for their potential of extracting insights into actions to gain a competitive advantage (Conboy et al., 2020). This phenomenon is largely coupled with the fact that more data is available to businesses than ever before. Data availability now includes data from competitors, customers, social networks, user-generated content, machines, products, and internal business (Mortenson et al., 2015). These data sources are often too complex, too large, and generated at such a velocity that traditional data processing techniques are insufficient (Delen & Zolbanin, 2018). Following these issues, new methodologies and processing techniques have been introduced, giving rise to a new era in business decisions making, as per Mortenson et al. (2015), the business analytics period. The most widely adopted definition of analytics (Hindle et al., 2020) arises from Davenport and Harris (2007, p7) that states: *"By analytics we mean the extensive use of data, statistical and quantitative analysis, explanatory and predictive models and fact-based management to drive decisions and actions."* Further, data analytics is a broad term applied to the analysis of any data, while business analytics is considered the general term for any data analytics in business problems (Duan & Xiong, 2015). In this report, business intelligence and analytics (BI&A) will be used as a combined term and is defined according to Lim et al. (2013) as technologies, systems, practices, and applications to analyze critical business data to gain new insights of the business and markets. BI&A is a transdisciplinary field where operations research, machine learning, and information systems are particularly relevant (Hindle et al., 2020). However, the academic focus on the field has mainly been on technical aspects, and there is a lack of business and operations research in the area (Delen & Zolbanin, 2018; Conboy et al., 2020).

Further, dynamic capabilities theory has grown to be one of the most dominant theories in explaining what enables a firm to adapt to changing environments and sustain a competitive advantage (Schilke, 2014). Dynamic capabilities suggest that the ability of a firm to reconfigure its resources and capabilities explains long-term competitive advantage. Building on the dynamic capability perspective, also seeking to resolve what explains a firm's ability to remain competitive is organizational ambidexterity. Organizational ambidexterity refers to a firm's ability to both explore and exploit business opportunities (O'Reilly & Tushman, 2008), which is often described as the ability of a firm to pursue both efficiency and innovation. The organizational theory assumes that the capabilities for exploring and exploiting are widely different, which creates challenges and tensions in organizations in sustaining both (Raisch et al., 2009). Many studies have focused on how organizations should structure themselves to sustain exploration and exploitation and the linking of these activities (Papachroni et al., 2015).

The literature addresses several interesting topics for further analysis in areas of business intelligence and analytics, online retailing, and organizational change in uncertain environments. For instance, Akter and Wamba (2016) highlight a need to explore how firms extract value from big data at their disposal and how the use of big data varies in adoption and implementation between different firm types in the e-commerce industry. Since 2016 the area of extracting business value from BI&A has been extensively examined, and "competitive advantage" and "customers" are the two most frequently covered topics in the intersection between the fields of data science and business analytics (Hindle et al., 2020). However, as Hindle et al. (2020) further state, the use of big data and BI&A is quickly evolving and improving, which gives the need for further exploration of how the field is developing. Further, Benitez et al. (2018) call for additional research on how firms leverage information technology (IT), such as business intelligence and analytics, to create business value. Additionally, they ask for further investigations on the effect IT has on firms' exploration and exploitation capabilities in other countries than Spain and the US, where former studies previously have been conducted.

This study aims to address how value is created through the use of BI&A in the online retail market in Sweden. By investigating how online retailers in Sweden use BI&A to create value, we hope to provide rich new insights on the topic in a previously unexplored market. Further, as the online retailing market is mature in Sweden, and the country is viewed as a fore-frontier in IT, it could be especially interesting to study this market. Additionally, by addressing if, and if so, how business analytics are used to facilitate exploratory and exploitative activities, we hope to contribute to academia on how business analytics can assist organizations in creating and sustaining a competitive advantage.

1.1 Purpose and Research Questions

The study aims to provide insights to the strategic management literature on the phenomenon of how BI&A are used to create value in the context of B2C online retail companies operating in Sweden. Further, the study aims to describe how BI&A supports online retailers' processes of exploring new opportunities and the exploitation of their existing business. Particularly this approach will highlight if and how BI&A are used to create and sustain both a short and long-term competitive advantage by online retailers.

The questions the study will seek to answer are the following:

1. How are business intelligence and analytics creating value in the B2C online retailing industry in Sweden?
2. How are business intelligence and analytics supporting online retailers' exploitative and explorative activities, and whether and how it facilitates their ability to be ambidextrous?

1.2 Delimitations

The study looks at B2C online retailers operating in Sweden. Online retailers included in this study are those having more than 50% of total sales through online sales channels. Further, the selection is delimited to companies primarily in retailing, mainly selling products manufactured by others. The study does not intend to answer if B2C online retailers in Sweden can be considered ambidextrous organizations but to clarify how BI&A tools facilitate ambidextrous processes. An assumption is made that the organizations selected are ambidextrous to some degree. Further, the study does not aim to make recommendations on how online retailers should conduct their BI&A processes to create value but to understand how they are used to create value today.

1.3 Outline of the Report

The report is structured by introducing the phenomenon and research field with its delimitations and research questions in sections 1.1 to 1.2. Chapter two includes the literature review describing the underlying theory and literature on the subject of dynamic capabilities, ambidexterity, value in online retailing, business analytics, and business intelligence. The chosen method, analysis, and sample of the study and its implications for the results are discussed in chapter three. Chapter four describes the study results followed by chapters five and six, including discussion and conclusions answering the research questions and fulfilling the aim of the study.

2
Literature review

The following sections 2.1 to 2.5 depict the underlying theory on the current research of value, competitive advantage, ambidexterity, dynamic capabilities, business intelligence, and business analytics related to this study's area.

2.1 Value

What organizations perceive as value depends on the firm's strategic goals (Günther et al., 2017). However, according to Grant (2016), a firm's sole purpose is to pursue profit over the firm's lifetime, which will provide value maximization for all shareholders. In this paper, value will therefore refer to economic value for the company, which can represent itself as an organization's increase in profit, business growth, and competitive advantage (Davenport & Harris, 2007).

2.2 Creating and sustaining a competitive advantage

Research has shown that less than 0,1% of companies founded in the US are likely to survive to the age of 40 (O'Reilly & Tushman, 2011). Despite their size, vast stable financials and human resources, well-established large corporations can only expect to live between 6 to 15 years (Ormerod, 2005).

As competition is increasing in almost all industries, the primary goal of a firm's strategy is to build a competitive advantage (Grant, 2016). A competitive advantage can be defined as a firm's capacity to create value or simply as a firm's potential to create higher profits than competitors (Grant, 2016). Gaining a competitive advantage can arise from external sources such as acting on changing customer demands, input prices or technological change, or internally from a firm's capabilities to improve or innovate (Grant, 2016). Schumpeter (1942) describes competition as a dynamic process in which the industry is in constant change. The higher level of competition, the less stable industry structures become, and thus the less stable a competitive advantage becomes. Grant (2016) elaborates and describes a competitive advantage as a disequilibrium, and it is created by change and sets in motion the competitive process of discontinuity. So, the higher level of competition, the more extensive degree of change and innovation is needed to sustain a competitive advantage. Managing a competitive advantage involves two major dimensions: positioning and improving for

the present and adapting to the future (Grant, 2016). Jim March (1991, p. 105) expresses it as *"the heart of an enterprise's long-term survival was to engage in sufficient exploitation to ensure its current viability and, at the same time, to engage in sufficient exploration to ensure its future success."*

2.2.1 Dynamic capabilities

Dynamic capabilities theory has grown to be one of the most dominant theories in explaining what enables a firm to adapt to changing environments (Schilke, 2014). Dynamic capabilities enable firms to sense and seize emerging business opportunities and transform their operations accordingly (Teece, 2007). Dynamic capabilities suggest that the ability of a firm to reconfigure its resources and capabilities in ways that are valuable to the customer but difficult to imitate explains long-term competitive advantage (O'Reilly & Tushman, 2011). Dynamic capabilities intend to change a product, process, the market, or the scale served by a firm (Miles, 2018). They should not be confused with a firm's organizational capabilities that refer to how an organization earns a living (Miles, 2018). Even though there are considerable variations in definition, there is increasing convergence on the idea that dynamic capabilities are a set of identifiable and specific routines centered around coordination, learning, and transformation (O'Reilly & Tushman, 2011). These routines enable the renewal of organizational capabilities and increased flexibility in response to market change (Pezeshkan et al., 2016).

To make the process of analyzing dynamic capabilities manageable, Teece (2007) disaggregates the concept into three activities: *sensing* new opportunities and threats, *seizing* opportunities**,** and enhancing, combining, protecting, and, when necessary, *reconfiguring* the firm's intangible and tangible assets. Teece (2007) explains that sensing involves analytics systems of scanning, search, and exploration activities in customer needs, latent demands, technologies, markets, and the evolution of industries and the responses from suppliers and competitors. He further explains that overcoming a narrow search horizon can become problematic for firms tied to problem-solving competencies. Seizing is equivalent to addressing the new sensed opportunity through new products, processes, or services. Lastly, *reconfiguring* involves maintaining and improving tangible and intangible assets.

The theory has met some criticism regarding its definition. It is often described in ambiguous ways, and other concepts such as absorptive capacity, change management, organizational learning, and strategic fit address similar problems (Miles, 2018). Further, the theory has been critiqued in its lack of measurability and that dynamic capabilities are often assumed without specifying their exact components (Miles, 2018).

2.2.2 Ambidexterity

Another vastly influential theory, building on the dynamic capability perspective, also seeking to resolve what explains a firm's ability to remain competitive is organizational ambidexterity - a firm's ability to both explore and exploit market opportunities (O'Reilly & Tushman, 2008). Exploratory and exploitative activities are often described as whether a firm can simultaneously pursue efficiency and innovation. Similar to the theory on dynamic capabilities, criticism for the ambidexterity theory revolves around ambiguity regarding its definitions and measurability. According to O'Reilly and Tushman (2013) the generic use of organizational ambidexterity refers to the ability of firms to do two things at once, e.g., competing in different markets or with different technologies, which leaves room for interpretation. However, O'Reilly and Tushman (2013) stress that ambidexterity is not only about whether a firm can pursue both exploration and exploitation, but more importantly if they can develop the capabilities needed to compete in new markets and technologies to survive in changing market conditions. Turner et al. (2013) further discuss that the distinction between exploitation and exploration is not always clear-cut, and definitions are vague. However, in this study, exploratory and exploitative activities are defined according to Marchs' (1991) article, in which the literature on ambidexterity originated (O'Reilly & Tushman, 2008; Brix, 2019). March (1991) defines exploration to include terms such as search, variation, risk-taking, experimentation, play, flexibility, discovery and innovation, and exploitation to include refinement, choice, production, efficiency, selection, implementation, and execution. O'Reilly and Tushman (2011) argue that the ability of a firm to be ambidextrous is at the very core of dynamic capabilities, which gives managers two critical tasks. Firstly, they must accurately sense changes in the environment, such as technology, competition, customers, and regulation. Secondly, have the capacity to act on the opportunities and threats by reconfiguring both tangible and intangible assets (O'Reilly & Tushman, 2011).

While both exploratory and exploitative processes are viewed as necessary for a firm to survive in a changing or dynamic environment, no consensus has been reached on how these processes should be balanced (Brix, 2019). Many studies have focused on how organizations should structure themselves to sustain exploration and exploitation activities and how an organization should link these activities (Papachroni et al., 2015), which has led to two different views on how exploration and exploitation should be structured (Brix, 2019). The differentiation view assumes that the capabilities for exploring and exploiting are widely different, and therefore, exploitation and exploration must occur across units or organizations, defined as structural ambidexterity (O'Reilly & Tushman, 2013). On the opposing side, the integration view argues that the processes can exist within the same unit, with so-called contextual ambidexterity (Gibson & Birkinshaw, 2004). According to the integration view, both exploratory and exploitative activities can coexist and may be performed without trade-offs (Turner et al., 2013).

Further, it is debated whether maintaining explorative and exploitative is always beneficial for firm performance. According to Luger et al. (2018), the long-term benefits of balancing exploration and exploitation are highly dependent on the company's environment. They state that in environments of incremental change, maintaining a static balancing of exploration and exploitation might lead to superior performance, as incremental change often runs over long cycles. However, statically maintaining and balancing exploratory and exploitative activities will reinforce inertia, limiting a firm's ability to adapt its balance between exploratory and exploitative activities in contexts of discontinuous change (Luger et al., 2018). This inertia will hurt a firm's ability to change and thereby their long-term performance (Luger et al., 2018). From this fact, it can be derived that companies need to have the ability to perform exploratory and exploitative activities and have the ability to shift the balance of each when necessary.

Even though there are opposing views on how exploration and exploitation should be managed, it is agreed that both the abilities to perform exploration and exploitation are positively associated with performance and increases the likelihood of sustaining a long-term competitive advantage, especially under changing market conditions (O'Reilly & Tushman, 2013). Further, efforts have been made to investigate how firms can positively influence ambidexterity. Jansen et al. (2009) identify a set of organizational integration mechanisms and investigate the mediating effect they have on firms' ambidextrous ability. Their logic is that organizational integration facilitates value by linking knowledge sources and providing opportunities to use shared resources and gain synergies between units, which they hypothesize positively influences ambidexterity. The two mechanisms of organizational integration they analyze are cross-functional interfaces and connectedness. Cross-functional interfaces are defined as the use of personnel, task forces, or teams from different divisions with diverse expertise to enable knowledge sharing for exploitative and explorative processes (Jansen et al., 2009). The interfaces facilitate the cross-functional members to reach a common frame of reference and build understanding and agreement. Connectedness regards the patterns of a firm's social network in terms of density and provides the base where organizational members can share experience, knowledge, and transfer and integrate new ideas (Jansen et al., 2009). Jansen et al. (2009) find that cross-functional interfaces mediate exploratory and exploitative processes as it provides linkages between units and on the hierarchical level and eases communication. Further, they find that connectedness has a direct contribution to achieving ambidexterity. Turner et al. (2013) also highlight the importance of similar mechanisms to accommodate formal and informal coordination and processes for creating social relationships and coordination for achieving ambidexterity. Further, Jansen et al. (2006) conducted a study to test how formalization affects exploitative and explorative processes. Formalization is the amount that rules, procedures, instructions, and communications are formalized or written down (Khandwalla, 1977). Formalization was found to have a positive relationship with exploitive outcomes, as existing knowledge and skills accelerate the diffusion of best practices within units. Additionally, it did not negatively

influence explorative activities, even though March (1991) stated that the reliance on rules and procedures hampers experimentation and ad hoc problem-solving efforts.

2.3 Business intelligence and analytics

The terms referred to as business intelligence (BI) and business analytics (BA) and their definitions are not agreed upon and are often used as subsets or special cases of each other (Mashingaidze & Backhouse, 2017). The most widely adopted definition of analytics (Hindle et al., 2020) arises from Davenport and Harris (2007, p7) that states: *"By analytics we mean the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions."* Stubbs (2011) describes business analytics to expand analytics by using descriptive, predictive, and prescriptive analytics to create valuable information to improve business performance. These perspectives align with Mashingaidze and Backhouse's (2017) definition, that describe business intelligence as a set of tools and techniques to use data for decision-making, and business analytics to be a more advanced form of business intelligence. In this report, we will use business intelligence and analytics (BI&A) as a combined term and define it according to Lim et al. (2013) as technologies, systems, practices, and applications to analyze critical business data to gain new insights about business and markets.

BI&A, together with big data adoption, has recently in academic literature been discussed to create opportunities for companies to achieve growth and to improve their overall operations (Ajah & Nweke, 2019). Companies invest in business analytics to achieve a competitive advantage over their competitors (Seddon et al., 2017), and improving business processes through BI&A has great potential to create value and achieve a competitive advantage (Davenport & Harris, 2017). However, to be competitive in general, an organization must have attributes that they perform better than anyone else in their industry, for which BI&A can help improve performance (Davenport & Harris, 2017). Certain industries which generate or have appropriate data available are more suitable to leverage value from using BI&A, which has led some industries to have adopted BI&A to a greater extent (Davenport & Harris, 2017). In some industries, so-called analytical competitors have established themselves. Analytical competitors are organizations that use analytics extensively and systematically to outperform the competition (Davenport & Harris, 2017). Examples of these are Nike and Tesla in the consumer product industry, or Amazon, Tesco, and Walmart in the retail industry. However, Davenport and Harris (2017) state that the likelihood of obtaining a competitive advantage from a specific analytic resource increases with the level of sophistication (figure 2.1), seemingly unrelated to industry-specific progress.

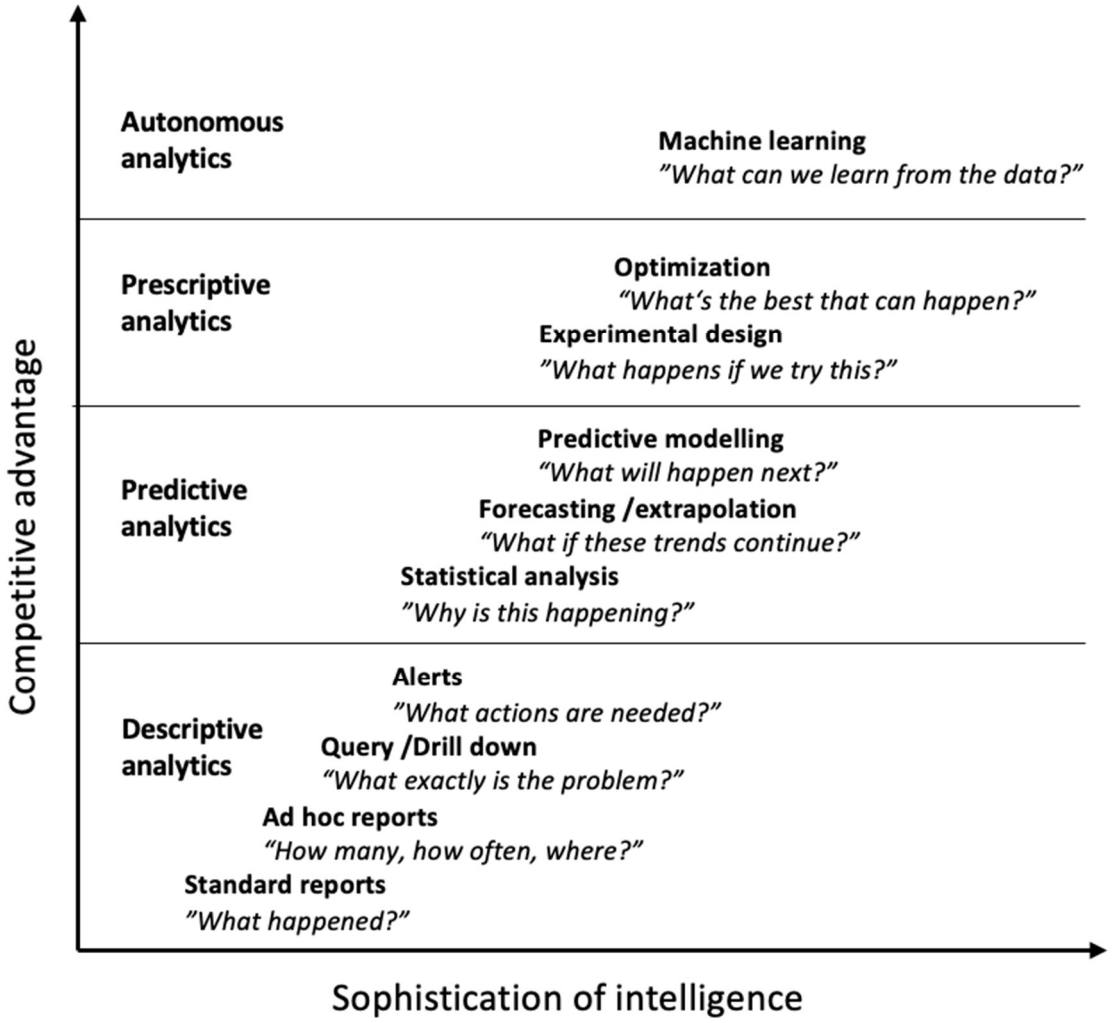

Figure 2.1. *The level of sophistication of analytics in relation to potential competitive advantage. Based on Davenport and Harris (2017).*

2.3.1 Data management and analytics

Data acquisition and management is the first step of being able to generate insights from data. The acquired data can either be fully unstructured, structured or between these extremes, so-called semi-structured (Gandomi & Haider, 2015). One of the differentiating factors of big data to data is the variety of data types, which commonly can handle unstructured data and increase data management complexity. Data management involves collecting, storing, processing, and transferring data (Duan & Xiong, 2015, which can involve internal, external, or open sources (Hindle et al., 2020). Data storage is commonly realized through data warehousing, which consolidates information of different kinds to be analyzed (Ajah & Nweke, 2019). Transfer and process data include the exchange of data within networks (Duan & Xiong, 2015).

Data analytics can be used to draw insights from data when it has been gathered and stored correctly. There are three methods of analyzing data: descriptive analytics,

predictive analytics, and prescriptive analytics (Duan & Xiong, 2015). The methods can be seen to build on one another where descriptive analytics is the first stage of analysis. The primary goal of using descriptive analysis
is to understand the data and its indicators of underlying success or failure (Duan & Xiong, 2015). The second stage of predictive analysis aims to predict the future with past data, using statistical models, assuming that what happened in the past will happen again in the future. Prescriptive analytics is the last stage of analysis involving heuristic search, mathematical programming, and simulation to find the most advantageous actions or decisions to be taken ahead (Duan & Xiong, 2015). The last stage of analytics tries to support decision-making by finding the optimal action using different parameters in mathematical modeling. Davenport and Harris (2017) define descriptive, predictive, and prescriptive analytics in similar ways. They correlate descriptive analytics with business intelligence, as reportings of historical and current data, predictive analytics as quantitative techniques that use past data to predict the future. Lastly, prescriptive analytics is assigned to methods and techniques that specify optimal behavior and action, such as recommendation engines (Davenport & Harris, 2017).

2.3.2 Big data

Big data has in recent years emerged as a concept used in academia and in companies using analytics to improve their business. Gandomi and Haider (2015) define big data similarly to Laney (2001) by three V's: volume, variety, and velocity. Volume refers to the magnitude of data, variety to structural heterogeneity of the data, and velocity to how much data is supposed to be analyzed up to a certain speed (Gandomi & Haider, 2015). Some sources include additional V's to the definition of big data with veracity, variability, and value (Gandomi & Haider, 2015). Data needs to fulfill all three V's to be classified as big data, but there is no specified numerical threshold value for classification. Limits of data classification as" big data" instead depend on the firm using the data's size, industry belonging, and location, which also changes over time (Gandomi & Haider, 2015). The threshold for classification of big data is situational-based and evolves over time, making it challenging to define a relevant universal threshold.

2.3.3 Value creation process of business analytics

Seddon et al. (2017) describe how business analytics contributes to business value through a process model. The model includes organizational factors to succeed with business analytics value creation and a high-level conceptualization of the process (See Figure 2.1). Seddon et al. (2017) argue that the value created by business analytics is formed by decision-making and actions taken based on insights from the use of business analytics. The value created by the action from business analytics can be aimed at better using current resources or by changing the organization's existing resources.

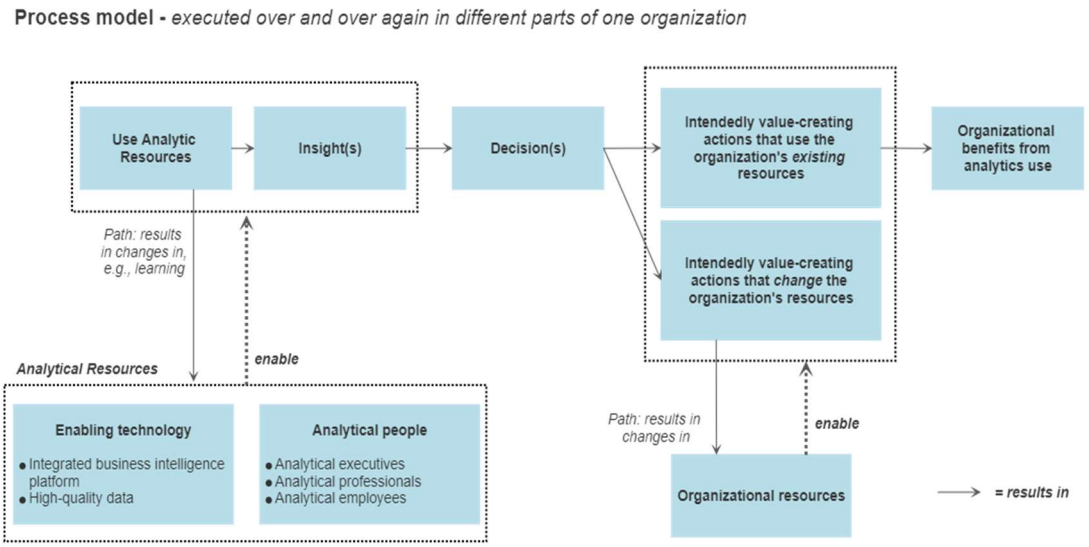

Figure 2.2. *Process model for value creation. Adopted from Seddon et al. (2017)*

Hindle et al. (2020) describe that business analytics can create value by using different types of analytics and data. Relatively small amounts of data can with analytics support better business decisions (Hindle et al., 2020). Examples of big data and analytics value include better and faster decision-making, cost reductions, and new types of product offerings (Ajah & Nweke, 2019).

2.4 Online retail industry

Retailers can no longer be described as intermediaries that buy from suppliers and sell to customers. Instead, they are orchestrators that serve an ecosystem where value is created and delivered to customers and appropriated by the retailers and business partners (Sorescu et al., 2011). Value creation can include product development or flexible pricing, and value appropriation can include improved inventory management or governance structures that increase customer switching costs (Sorescu et al., 2011).

2.4.1 Business model of an online retailer

Where a firm's strategy articulates how a firm aims to achieve a competitive advantage (Grant, 2016), the business model focuses on how the firm creates and appropriates value to achieve a competitive advantage (Sorescu et al., 2011). The business model details the structures, activities, and processes that connect the firm's internal areas such as marketing, sales, and finance to external parties such as customers, suppliers, and partners (Teece, 2010). There is no standard definition of a business model. However, it is agreed that a business model describes a firm's value proposition (Sorescu et al., 2011). Sorescu et al. (2011) define a business model as the structures, activities, and

processes that serve as a firm's organizing logic for value creation (for customers) and value appropriation (for itself and its partners).

Three broad B2C business models for selling products to end-consumers online are defined in table 2.1.

Name	Comment	Companies	Source
Virtual merchant	A retailer that sells products or services solely through an online channel. They can either be handling products themself or let third-party actors store, handle, and ship products.	Amazon, Adlibris, CDON	(aiHello, 2019)
Omni-channel merchant	A retailer that possesses both a physical store and an online sales channel.	Intersport, Clas Ohlson	(aiHello, 2019)
Manufacturer-direct merchant	A manufacturing company that sells directly to consumers through their own online sales channel. No wholesale or retail involvement when it comes to their specific online sales channel.	Apple, Ralph Lauren, Dell	(aiHello, 2019)

Table 2.1. *Broad business models of online retailer B2C*

While each online retailer falls into one of the above-specified categories in table 1, there are differences in the business models commonly used within each category. Virtual merchants are often divided into virtual merchants that handle the logistics for the products or only handle the economic transaction, and whether they sell their own branded products or not. One example of a virtual merchant business model is the platform strategy adopted by Amazon (Hagiu & Wright, 2015a). Virtual merchants typically buy products from wholesalers or manufacturers, store the product, and then sell it to consumers; platforms instead typically only handle the transaction letting third-party sellers handle logistics around the product (Hagiu & Wright, 2015a). In the case of Amazon, a combination of a regular virtual merchant business model and a platform with third-party sellers has been adopted (Hagiu & Wright, 2015b). Further, does Amazon's choice of business model differentiate itself in that third-party sellers compete on the Amazon site (Hagiu & Wright, 2015b). Another emerging trend within online B2C e-commerce is subscription models (Chen et al., 2018). The subscription model is possible to be adopted by all online retailers regardless of the category belonging above. The subscription model is based on the online retailer selling the service of delivering products on a recurring basis to customers (Chen et al., 2018).

However, similarities, independent of the business model, can also be found. Firstly, retailers primarily sell products manufactured by others. Secondly, they engage and interact directly with the end-consumer. According to Sorescu et al. (2011), these two rationales can affect the potential for innovation in retail. Due to selling other firms'

products, a focus on only product assortment is unlikely to sustain a competitive advantage since products are likely found elsewhere, which stresses the importance of how retailers sell rather than what they sell (Sorescu et al., 2011). The direct interaction with the consumer gives importance to the customer interface and how the retailer will optimize interaction and strengthen the customer relationship (Sorescu et al., 2011). These two facts have led to a moving focus from transactions to enhancing customer experience (Sorescu et al., 2011).

Given that the retailing business models now require enhancing customer experience beyond traditional functions of moving, procuring, and stocking products, Sorescu et al. (2011) propose a few themes that define retailers' value creation or appropriation. The themes of value creation they propose are customer efficiency, customer effectiveness, and customer engagement. Where operational efficiency, operational effectiveness, and customer lock-in represent ways of value appropriation for a retailer, and customer efficiency and customer effectiveness embody the process of creating value for the customer. Customer efficiency refers to the process of making customer's access to products as available as possible (Sorescu et al., 2011). A recent trend towards increasing customer efficiency has been to implement an omnichannel business model, where customers can access products both online and in stores. Customer effectiveness is to which degree the retailer can facilitate the consumer's shopping goals (Sorescu et al., 2011). Increasing customer effectiveness can be done by matching assortment with demand or creating a user-friendly and frictionless experience. Traditionally increasing customer effectiveness has meant increasing the depth of assortment of popular and quick-selling products while leaving the demand for niche products unmet. However, the internet has decreased consumer's searching costs, allowing many online retailers to focus their business on niche market segments instead and selling hard-to-find products to many customers (Sorescu et al., 2011)**.** Customer engagement involves to which extent the retailer can evoke emotional involvement beyond the purchase (Sorescu et al., 2011). Operational efficiency refers to doing things faster, cheaper, and simpler, which can manifest itself in, e.g., better inventory management and keeping shelf levels optimal for faster turnaround or through cost reductions by improving the store environment (Sorescu et al., 2011). Operational effectiveness refers to doing the right things, in contrast to efficiency, which entails doing things right. Operational effectiveness means getting the desired results by operating in a maximally effective way for reaching the organization's objectives, such as target market reach or profits (Sorescu et al., 2011). Increasing operational effectiveness in the retail industry can manifest itself as implementing flexible pricing to extract maximum profits from different market segments or matching assortment with demand. Since retailers are not bound to a set product portfolio like manufacturers, they have an advantage in high flexibility in determining product assortment. Customer lock-in is activities intended to lower customers' incentives to search for other firms and switch after the initial purchase (Sorescu et al., 2011). Traditionally in retail, this has been done through memberships or extended warranties. Today more retailers are trying to create loyalty that reflects enduring customer relationships, e.g., contract or subscription-based

models (Sorescu et al., 2011). Lock-in can also be created by creating an assortment that is unique, inimitable, and with a clear value proposition.

2.5 BI&A and ambidexterity in the online retail industry

Both academia and online retail companies have recently caught an interest in the use and benefit of using big data and business analytics (Akter & Wamba, 2016), much due to that research have shown that there is a positive relationship between business analytics and firm performance and that it can enable business process change (Torres et al., 2018). Akter and Wamba (2016) investigated in a literature review of 121 papers the progression of research in the intersection of big data and business value in the e-commerce industry. Their review shows that research has shown big data analytics to create benefits in a range of areas. Big data analytics can create transaction value in the form of cost savings, increased productivity and efficiency, and strategic value such as in competitive advantage and firm performance, by transforming parts such as production, inventory, innovation, and finance (Akter & Wamba, 2016).

Further, they state that the use of big data is skyrocketing in e-commerce due to social networking, the internet, mobile telephone, and other kinds of technology that create and capture data, which is influencing the e-commerce industry to handle the unique nature of big data, that of high volume, variety, and velocity (Akter & Wamba, 2016). However, Vidgen et al. (2019) show that while data may be classified as big, it is not required to create business value. Organizations can create substantial business value from relatively small amounts of data, which may not have been exploited previously, giving new insights on customers, processes, and the competitive environment (Vidgen et al., 2019). Thereby, this study will not focus on separating big data analytics from traditional data analytics but rather focus on the value created by BI&A independently of it can be classified as big data according to volume, variety, and velocity.

In the context of ambidexterity, prior research on exploration and exploitation has mainly focused on balancing the activities are the trade-offs and problems that arise from pursuing both, but it remains unclear how IT technologies facilitate ambidexterity (Benitez et al., 2018). In their study, Benitez et al. (2018) identify that IT infrastructure provides a foundation for building business experimentation and helps to sense and explore business opportunities. Additionally, IT helps develop operational proficiency and to exploit opportunities (Benitez et al., 2018). Their report separates an organization's exploratory capability into the organizational capabilities of business experimentation and business flexibility. Business experimentation is defined as the firm's ability to foster experimentation, creativity, and innovation of new business opportunities (Benitez et al., 2018). Business flexibility is defined as the firm's ability to sense and seize opportunities for competitive action by changing the operational processes, organizational structure, and business strategies. The exploitive capabilities of the firm are disaggregated into operational competence and refer to the firm's ability to exploit its portfolio of operational capabilities for business benefits (Benitez et al.,

2018). These definitions of exploratory and exploitative activities align with our definition, based on March's (1991) definitions of exploration (search, variation, risk-taking, experimentation, play, flexibility, discovery, and innovation) and exploitation (refinement, choice, production, efficiency, selection, implementation, and execution). Benitez et al.'s (2018) study investigated the relationship between IT capabilities and exploitative and explorative capabilities and the relationship between explorative and exploitative capabilities. Their results show that IT has the most significant effect of enabling business experimentation, which is argued to result from IT providing the tools to organize information, handle collaboration, provide ideas, and enable the pursuit of creating endeavors. IT was also found to affect business flexibility, however, with a smaller impact than for experimentation. Thus, Benitez et al. (2018) state that IT affects creativity more than the ability to change. In regard to operational competency, or a firm's exploitive capabilities, IT was also found to facilitate the development of operational competency to exploit opportunities. Regarding the influence of how explorative capabilities affect exploitive capabilities, business experimentation was found only to mediate business exploitation, linked through business flexibility. This, they argue, shows that a firm needs to have the ability to change when an opportunity is found to have an impact on a firm's ability to exploit.

Benitez et al. (2018) contribute to how information technology influences a firm's exploratory and exploitative capabilities. Their definition of IT is broad and regards computer-aided technological, managerial, and technical resources that provide the basis of using IT applications. Benitez et al.'s (2018) definition of IT, e.g., includes hardware, software, and the skills needed to use, develop, and improve applications. Further, Boaden and Lockett (1991) state that many common terms are used as subsets of IT, such as decision support. Thereby, we view business analytics to be a subset of IT. Benitez et al.'s (2018) study call for further research on how firms leverage IT to create business value and its effect on firms' exploration and exploitation capabilities in other countries than Spain and the US, where former studies primarily have been conducted.

3
Methodology

This chapter entails the chosen methodology and theoretical reasoning for this study. The chapter includes a description of our chosen research design and approach, qualitative data collection, and adapted analytical method. Finally, the chapter ends with a discussion concerning the quality and ethics of the report.

3.1 Research Strategy and Approach

According to Bell et al. (2018), research strategy refers to the overall approach of a research project, including methods chosen to answer the research question.

Blaikie (2011) states that the main approaches to business research are of an inductive, deductive, retroductive, or abductive kind. The approach refers to the role of theory in research, where research either tests a theory through a hypothesis or generates a new theory. The two extremes of the main approaches are the inductive and deductive approaches. An inductive approach refers to generating theory solely from data collected, and the deductive approach tests previous theory through data (Blaike, 2011). Braun and Clarke (2006) state that an inductive approach is enhanced by not engaging in prior literature before the analysis, as it likely influences the outcome. As the aim of the study was set, and readings were done on existing literature before conducting the analysis, an inductive approach was assessed to be inappropriate, as the theory generated with an inductive approach should emerge without influence. The chosen field to be investigated, of how online retailers operating in Sweden use BI&A and how it is used to support their explorative and exploitative processes, is scarcely researched, particularly in an e-commerce setting. As previous studies were limited and this study aspired to enrich and elaborate on existing knowledge, an abductive approach was assessed to be appropriate. As per Mantere and Ketokivi (2013), an abductive research approach entails that the researcher adopts the best fitting theory and bases the empirical findings on parts of that theory.

Chosen methods in business research are commonly divided between quantitative and qualitative methods, meaning whether the methods are based on the collection of numerical or composed of spoken words and images, respectively (Bell et al., 2018). According to Easterby-Smith et al. (2018), qualitative methods are used to gain insights into organizational realities through discovering the views, perceptions, and opinions of individuals and groups, which tends to be of an explorative nature. As this study aims to understand how online retailers are using BI&A, in what areas they benefit from

it, and how they perceive that this creates value and supports exploration and exploitation, a qualitative approach was adopted. Further, a qualitative approach has the advantage over a quantitative method of giving access to information in context and provides a more comprehensive view of the topic (Easterby-Smith et al., 2018). In this study, the qualitative data was gathered through semi-structured interviews and is further explained and motivated in section 3.2.

Through continuous iteration between empirical findings and existing theory, the aim was to find intersections and gaps between the collected data and theory and generate a holistic view of the value creation process of BI&A and how it supports both exploratory and exploitative activities. Identifying research gaps and fully covering the topic has been done by reading literature on business and data analytics, dynamic capabilities, ambidexterity, value creation, the retail and e-commerce industry, and through interviews with; CEOs and managers in retail firms; digital agencies specializing in data and business analytics in online retailing.

3.2 Data Collection

Qualitative data are gathered non-numerical data, typically collected through interviews, observations, videos, images, or documents (Easterby-Smith et al., 2018). Qualitative interviews are a powerful tool to capture the ways people make meaning of experiences (Rabionet, 2011). As value and its meaning are subject to individual perception and not consistently measurable, interviews were chosen. Further, as the study aimed to uncover and describe how firms work with BI&A and how this creates value for them, interviews were deemed appropriate as they are descriptive in nature. Interviews can be either structured, semi-structured, or unstructured. Structured involves having predefined questions asked in a specific order, allowing for no or little room for flexibility in responses (Easterby-Smith et al., 2018). Unstructured interviews involve informal conversation without an interview guide creating more variation in the answers but with no or minor guidance in the subject (Easterby-Smith et al., 2018). Semi-structured interviews include guided open questions, leaving room for some follow-up questions and variation in answers while still within the defined area of interest. Semi-structured interviews were chosen due to the explorative nature of the study, pressing on the importance of having questions within the area of interest. At the same time, it allows for flexibility to capture information outside the knowledge of the authors' earlier academic research. Primary data collected in the form of semi-structured interviews constituted the basis for the findings of the study.

The crafting of an interview guide should, as per Rabionet (2011), be guided by reading previous literature and work on the subjects of interest. Consequently, the formation of the interview guide was directed by a continuous screening of literature on topics such as business value, online retailing, e-commerce, ambidexterity, exploration, exploitation, business analytics, data analytics, business intelligence, and big data.

Further, Google Scholar was used for finding articles, websites, and papers on business analytics to identify tools and terms used in the online retailing industry. The initial review of the literature allowed the interviewers to familiarize themselves with previous research and common concepts to craft the interview guide. The interview guide was designed with general and open questions at initiation and specific questions further into the interview, which allowed the interviewers to initially take a passive role and let the interviewee start the interview into areas that they viewed as more critical and in areas they likely were well-informed. The specific questions were used to help initiate new topics when the interviewees had nothing to add or if the conversation steered into irrelevant areas. Follow-up questions were frequently used to gain exemplifications and illustrations of discussed topics. The interview guides were continuously updated as previous interviews had been transcribed and analyzed, and new topics or ones in need of further exemplification were uncovered. See *appendix A* for the used interview guides.

Purposive sampling was chosen as the strategy for sampling, followed by snowball sampling. Purposive sampling involves the researchers choosing the sample of interviewees in line with the aim of the study (Easterby-Smith et al., 2018). In this study, the sample was based on characteristics of the firm, industry, company size, business model, and role of the interviewee. Snowball sampling involves making use of selected interviewees' recommendations of other people to interview. The use of snowball sampling in addition to purposive sampling was chosen as the interviewees could give recommendations of employees with additional insights to give. Additionally, them knowing the industry and their competitors yielded recommendations of new organizations and people to interview.

Easterby-Smith et al. (2018) describe representativeness and precision as two principles guiding decisions around sampling. Representativeness involves the sample's characteristics representing the larger population of companies, while precision involves the credibility of the results, representing the entire population by a large enough sample size in relation to the total population size (Easterby-Smith et al., 2018). Using purposive sampling with clearly defined characteristics of the population and targeting the B2C online retailers operating in Sweden, the demands to achieve representativeness and credibility were met. Using snowball and purposive sampling to find new insights does, however, create potential bias issues. While all interviewee's companies were within the defined characteristics of the sample, it cannot be concluded that the purposive and snowball sampling design has not affected the collected data. Although several different roles in different companies have been interviewed, higher-level managers could potentially be biased to portray their company in a flattering way. Further, internal recommendations from the snowball sampling could have been steered towards employees with similar views as the person giving the recommendation.

The interviews were held with 14 of the largest B2C online retailers having an online sales channel in Sweden, with yearly revenue between 100 million SEK and 5 Billion

SEK. Further, experienced experts within the online retail space were interviewed to broaden the insights from how business analytics are used. The interviewees chosen from the online retailers had titles such as CEOs, CIOs, CMO's, Business controllers, and Business development managers. Interviewees primarily with managerial roles were chosen as it was deemed that they likely could give a holistic view of how business analytics are used in their respective firms. Further, these roles generally have strategic elements incorporated, and therefore information could be gained on how business analytics impact short and long-term value creation. These chosen roles were, in some cases, complemented by an analyst to cover more in detail the work with BI&A. Furthermore, two interviews were conducted with experts in online retailing to extend the view of value created by BI&A. The target segment of the largest online retailers operating in Sweden, in their respective market segment, was chosen due to them having the most considerable likelihood of having BI&A implemented in their processes. Some companies and the associated interviewees' names are anonymized by their request, either due to being publicly traded companies, restricting what they can share, or due to internal company policies. Interviews were conducted until theoretical saturation was reached. Bell et al. (2018) define theoretical saturation as a state in which further interviewees do not add additional data giving new insights to the found concepts in the analysis. In this study, this became apparent in the last held interviews where no new value-adding actions of using BI&A or in the process of exploitation and exploration arose. This insight was reached through continuous analysis of the interviews, where, from the thematic coding, it could be seen that while new interviewees provided detailed examples, no new areas of interest arose.

The interviews were conducted during a period between 30 - 80 minutes, with an average of 50 minutes. The interviews continued until all questions in the interview guide had been covered. Due to the imposed recommendations related to the ongoing COVID-19 pandemic, interviewees were primarily conducted through video meetings via Zoom or Google Hangouts. In one case, the interview was held through telephone without a video connection. In close relation to a held interview, the recording was transcribed and analyzed manually. The analysis process is accounted for in section 3.3. In total, 18 interviews were held, resulting in approximately 15 hours of recorded material and 135 pages of transcripts. Table 3.1 displays the held interviews in this study.

Company	Company type	Person	Role	Interview date
Curamando	Consultancy firm	John Ekman	Partner	26 January
Engelsons	Omni-channel merchant	Stefan Engelson	CEO (Chief Executive Officer)	27 January
Adlibris	Omni-channel merchant	Sofia Söderqvist	CMO (Chief Marketing Officer)	29 January

Company A	Omni-channel merchant	Person A	CEO	1 March
Company B	Virtual merchant	Person B	Head of E-commerce	9 March
Nelly	Virtual merchant	Kristina Lukes	CEO	12 March
Kids Brand Store	Omni-channel merchant	Adeline Sterner	CEO	12 March
Dahlquist	Consultancy firm	Niklas Dahlquist	E-commerce consultant	12 March
Company C	Omni-channel merchant	Person C	CFO (Chief Financial Officer)	15 March
CDON	Virtual merchant	Rickard Johansson	Business Intelligence Manager	15 March
Adlibris	Omni-channel merchant	Magdalena Lindh	Web analyst	17 March
Pierce	Virtual merchant	Göran Sällvin	CMO	17 March
Bubbleroom	Virtual merchant	Esko Österbacka	CFO	19 March
Nelly	Virtual merchant	Adrien Mathieu	Business Analyst	19 March
Boozt	Omni-channel merchant	Peter Jørgensen	CMO	22 March
Company D	Virtual merchant	Person D	Controller	24 March
Company E	Virtual merchant	Person E	CRM & Marketing Automation Manager	30 March
Jollyroom	Virtual merchant	Emil Thell	CFO	30 March

Table 3.1. *Interviews held (See literature review for classification of company types)*

3.3 Analysis of Results

The analysis of the qualitative data was done by using thematic analysis as the adopted methodology. Thematic analysis involves searching for recurring features or patterns in the data (Braun & Clarke, 2006). The chosen methodology has its advantages in offering flexibility by minimally organizing data while describing the data in rich detail (Braun & Clarke, 2006). As the study aimed to provide rich insights and describe the phenomenon of how BI&A creates value and affects exploratory and exploitative processes, this methodology was seen as advantageous. Further, thematic analysis is appropriate as a method for interpreting experiences, meanings, and the reality of participants (Braun & Clarke, 2006), which was assessed suitable from the authors' realist ontology. As per Braun and Clarke (2006), a thematic analysis should be initiated by familiarizing yourself with the data, which was reflected in the process by continuously reading and discussing the content of transcripts from interviews throughout the data collection and analysis process. During the data collection, this allowed new areas of interest to be discovered, or the realization on specific topics that needed further elaboration and gathering of data. Further, data regarding these areas could then be collected through additional contact with previous interviewees and additions to the interview guide.

The transcripts were continuously coded by breaking down the data into parts and attributing names. Bell et al. (2018) state that the process of qualitative coding requires the researcher's interpretation of the data to shape emerging codes and themes, unlike quantitative research that requires data to fit into preconceived codes. The coding was conducted by first reading through the transcripts, making comments and summarizations on citations and portions of the transcripts. Further, each transcript was shortly summarized, and the comments were categorized and coded into either value-adding themes, processes, tools, or organizational functions, such as or A/B-testing, exploitation, Google Analytics, and marketing, respectively. When an initial coding had been conducted in Google Docs, the coding continued with the assistance of Microsoft Excel. Each citation and portion were initially shortly summarized. All summaries were then compared and analyzed to find common elements and then grouped into common codes. Additional remarks were made into what functions or units were inflicted by the codes. The codes were based on organizational actions done with BI&A, such as A/B-testing or customer segmentation, as the use of BI&A most often was described through actions. As the aim was to capture how BI&A creates value, codes could emerge from frequent or unique mentions, as both instances were needed to capture the value created. Consequently, themes could emerge from codes with as few as one mention. Subsequently, the codes were analyzed and discussed to decide how they should be grouped into themes. According to Braun and Clarke (2006), it is essential to address what should constitute a theme when using thematic analysis, as it is not clear-cut. However, the key to making a theme should depend on whether it can capture something important in relation to the research question (Braun & Clarke, 2006). During the interviews and analysis, it became apparent that certain functions and units

used business analytics to a greater extent than others, like marketing, and categorization of themes by function was discussed. However, as many codes were cross-functional, categorizing according to functions involved many overlapping codes, which made the portrayal of how value was created unnecessarily intricate, and thereby this idea was rejected. Further, it was concluded that the first-order themes should represent the expressed effect that each code/action had on the organization, which the codes were categorized into accordingly and constituted the first-order themes. Several first-order themes were multidimensional and could have been placed into several first-order themes. These codes were placed into several first-order themes if they had significant implications for multiple themes, and if the code was primarily affecting one theme, it was placed under a singular theme. Later, the first-order themes were categorized into second-order themes, based on how the first-order effects implicated business value. These common second-order themes formed into operational efficiency, increased sales, and the competitiveness of the business.

The thematic analysis was done separately by the authors, meaning that each transcribed interview was read and analyzed for finding areas of interest by both authors. The found areas of interest were then discussed among the authors, and when they were interpreted differently, discussed if to be included. The entire analysis involved subjective interpretation, and the involvement of both parties allowed for discussion and, thus limiting subjective interpretations influencing the result. Figure 3.1 shows the coding, which forms the basis for sections 4.1 to 4.3.

Code	First-order theme	Organizing theme
Attribution modeling	Digital marketing efficiency	Operational Efficiency
Automized marketing channel investments		
Customer value segmentation guiding marketing		
Modeling of marketing channel investments		
Report data to Google on customer choices		
Customer requests guiding customers service staffing	Administration and customer service efficiency	
Identification of bottlenecks		
Less required personnel due to automatization		
Machine learning categorization of products		
Sales data predicting future sales		
Follow up on employment satisfaction		
Sales predictions guiding warehouse staffing	Warehousing and logistics efficiency	
Follow up on efficiency in warehousing activities		

Add-on service advising product fit based on data	Decrease returns	Operational efficiency
Identification of characteristics of products being returned		
Identification of customers with excessive returns		
Identification of reasons for returns on certain products		
Automated purchases based on decided levels	Optimization of purchases and stock	
Identification of bad selling inventory		
Marketing and logistics capacity coordination		
Marketing and stock availability coordination		
A/B test of shipment price effect on sales	Average order value	Increase sales
Add-on service for upselling		
Product recommendations		
Product listings based on customer data		
A/B testing	Conversion rate	
Analysis of customer journey		
Analysis of newsletter effectiveness		
Analysis of website speed		
Price scraping		
(Marketplace spec.) Product categorization improvement	Customer retention	
Customer requests guiding customers service staffing		
Customer service performance		
Customer-value segmentation guiding service level		
Drop shipment analysis of supplier's delivery times	Customer retention	
Follow up on customer happiness		
Identification of bottlenecks		
Newsletter sent based on time intervals and purchase	Increase traffic to the site	
Visualization of marketing channel data		
Add-on service to suppliers based on data	Inhouse marketing sales	
Assessment of customer lifetime value	Value segmentation of customers	Competitiveness of business
Identification of key signs of high-value customers		
Brand recognition tracking	Branding, positioning, and assortment	
Identification of market and product trends with external data		

Matching assortment to demand		Competitiveness of business
Social media analysis		
Price adjustments based on historical customer demand	Increase average profitability of sales	
Price adjustments based on competitor's incapacity		

Figure 3.1. *Thematic coding of interviews*

3.4 Research Quality

One way described by Bell et al. (2018) of assessing the quality of research is proposed by Lincoln and Guba (1985) and Guba and Lincoln (1994), who introduce trustworthiness and authenticity as criteria assessing the research quality. The trustworthiness criteria consist of credibility, transferability, dependability, and confirmability (Bell et al., 2018).

Credibility has to do with the match between the observations of the researchers and the ideas and theory created (Bell et al., 2018). The researcher used current literature on qualitative research methodology to design the study in a preferable way matching the aim of the study. Further, transcripts and quotes were sent to the interviewees to check that the author's interpretations reflected what the interviewee meant, and both actions were taken to increase the study's credibility.

Transferability involves the generalization of the findings, meaning how the results can be applicable to a broader population than the sample (Bell et al., 2018). In order to judge the generalizability of findings within the group sample, the researchers of this study have made a thorough description of the sample and each interviewee, including company name and type, person's name and role, and date of interview. Secondly, interviews were held until theoretical saturation was reached to include as many factors as possible.

Peers should understand the study process and be able to audit the process to achieve high trustworthiness. Trustworthiness is proposed by Lincoln and Guba (1994) to be achieved partly through dependability. It is adhered to by having a thorough description of the process, such as the sampling, interview guide, transcripts of interviews, and analysis (Lincoln & Guba, 1994).

The last part of trustworthiness proposed by Lincoln and Guba (1994) includes confirmability, involving the researcher's efforts to limit personal values affecting the results, achieving as high objectivity as possible in each part of the study. While Bell et al. (2018) describes that it is impossible to achieve complete objectivity, the researchers have made efforts to create as high objectivity in the study as possible. Firstly, all transcripts from interviews are available on request. Secondly, the

researchers analyzed each interview transcript separately to minimize individual personal values.

3.5 Research Ethics

Bell et al. (2018) state that there are four main ethical concerns to be considered when conducting a study: whether there is - harm to participants, lack of informed consent, invasion of privacy, or deception involved.

To address these considerations, information regarding the objective of the study was informed to all interviewees. Further, every interview started with discussing whether the interviewee agreed on the conversation being recorded, whether they wanted themselves or the company to be anonymous, and if they wanted to approve eventual quotes used before publishing. By being upright about the intent and purpose of the study and giving the interviewees a second review of quotes and the opportunity to be anonymous, ethical concerns have been addressed.

4
Results

This chapter presents the value that the online retailers described was gained from the use of BI&A. Further, insights regarding how BI&A supports their current organizations' abilities to exploit and explore are presented. The chapter is firstly divided into three sections (operational efficiency, increase sales, and competitiveness of business) which emerged from the coding as the main areas BI&A are used to create value. Associated subheadings are those found from the thematic analysis seen in figure 3.1. Certain first-order themes are multidimensional and are represented under multiple second-order themes. These themes are accounted for under the first-order theme it affects most significantly. A complete representation can be seen in figure 3.1. Lastly, a section follows, presenting the findings on how BI&A is used to support online retailers' exploitive and explorative processes.

4.1 Operational efficiency

Several interviewees describe B2C online retailing as a low-margin industry with large direct costs associated with each sale. An online retailer must efficiently run the operations to lower the direct and indirect costs to achieve profitability. The interviewees explained that the large direct costs associated with online sales include online marketing, logistics, third-party payer system fees, warehousing, procurement, and in some sales, costs associated with returns. The interviewees described that lowering the direct costs create value by a substantial effect on the overall profitability. A few interviewees have also described product obsolescence as an essential metric that influences profitability and should, consequently, be low. Product obsolescence refers to the loss of value for products that become harder to sell for various reasons. The following sections, 4.1.1 to 4.1.5, describe how the interviewees use data and BI&A to create value by lowering costs and increasing the inventory turnover rate.

4.1.1 Digital marketing efficiency

Customer acquisition is, by many interviewees, described to be an essential part of driving sales and should, consequently, be managed in a way that increases sales efficiently. Person C (Company C) describes:

> *"The online team looks at what the cost of marketing is in relation to the order intake. It is maybe the most important metric because one thing that often distinguishes successful from unsuccessful online retailers is the amount they spend on getting customers to buy. Marketing spending can vary from 5-20% of total the turnover, which is why we monitor this metric daily."*

To ensure that the marketing costs do not become too high, several interviewees have emphasized the importance of clearly gathering and visualizing the marketing data and its expenditures in different channels. The interviewees further describe several different methods to use data and BI&A to decrease marketing costs. An issue multiple interviewees described is not knowing exactly how effective their used marketing channels are when it comes to cost in relation to the number of customers acquired. While all marketing channels have the same purpose of acquiring new customers, the different channels create problems attributing the value from the investment. Attribution modeling is one method to understand better how each marketing channel contributes. Adeline Sterner (Kids Brand Store) highlights this:

> *"Many times, you work with last-click, meaning that you see the acquired customer's last clicked advertisement. However, a person choosing to click a certain ad might do so because he or she has seen the product and our brand in ten different other places, which is influencing the decision to click on the advertisement. This makes it seem like the last clicked ad is exaggeratedly cheap when in reality, other communication also influenced the decision. This is why we work with attribution, to actually see how effective each channel is"- Adeline Sterner (Kids Brand Store)*

Person B (Company B) further exemplifies this:

> *"The advertising on Facebook is never on its own getting enough credit without us examining the ad influence. Hence, we ask the customer how they came to our site, giving us data which we then analyze to understand the actual number of acquired customers from Facebook."- Person B (Company B)*

Attribution models try to assign the newly acquired customers to the correct marketing channel by capturing data on each interaction the customer has with the different marketing campaign and when the customer converted into a buying customer. These models are then adjusted based on these interactions to make the model as accurate as possible. Further, some interviewees stated that they asked the customers how they had found their site.

Some of the interviewees take this attribution modeling of seeing how profitable they are in each marketing channel one step further by automating the processes of the investments in the different marketing channels. Göran Sällvin (Pierce) is one of the interviewees who illustrate this:

> *"Marketing is automated based on different data points from which we drive either to maximize profitability or revenue. We have built a dataset to see how profitable we are in each marketing channel. [...] To achieve the set profitability goals, we, therefore, built a model based on 2020 data where we can simulate 2020 again at different investment levels, creating a normal distribution curve showing the point of investment to achieve maximum growth in 2020. This model is then applied to 2021 to see how large the marketing investment should be to maximize profitability and/or growth" – Göran Sällvin (Pierce)*

Another way of decreasing cost in marketing described by interviewees is using segmentation of customers based on value. Online retailers want to advertise to customers with a high likelihood of buying upon seeing the advertisement since this lowers the amount needed to be spent to achieve a certain number of sales. Peter Jørgensen (Boozt) describes this:

> *"In early days, we decided to make customer segments based on their behavior, divided into three tiers in terms of value. [...] The customers are divided into 15 different segments based on what they in the past have bought, to what price, and the number of products they have returned. If you, for example, are a customer who has bought much without discount, not returning any products, then you are regarded as a very high-value customer. By doing this, we can focus marketing on the high-value customers but also make sure to exclude the ones we know buys very small amounts at a discount, or are frequently returning products." - Peter Jørgensen (Boozt)*

All interviewees emphasized using Google Analytics and Facebook in marketing for advertisement and as a means to understand the customer journey better. While the data presented by Google was widely seen as very good and valuable for all the online retailers, Person B (Company B) highlighted one additional way of decreasing unnecessary spending in marketing with Google Analytics by reporting data back to Google and Facebook. One example, described by Person B (Company B), is when a customer decides to withdraw a product from their shopping cart. When this happens, it might not be desired to advertise the same product to the customer on Facebook or Google since they have shown not to want the product. Person B (Company B) describes this as a way to lower the cost and protect the brand by not annoying the

customer with advertisements on things they have clearly shown that they do not want to buy at the moment.

4.1.2 Administration and customer service efficiency

In some cases, administration costs in online retailing are possible to decrease with no or small effect on operations with BI&A. To understand how much administration is required, online retailers need to forecast and set budgets. The previously introduced forecasting model based on value segments also have the possibility to do this, Peter Jørgensen (Boozt) explains:

> *"We have seen that customers in different value segments come back with a certain likelihood. Based on the number of customers in each value segment, we can fairly precisely predict how much they will spend with us in 2021. This, together with past years' data on the number of newly acquired customers, becomes the basis for our forecast. With an added predicted number of returns you can get a projected revenue over the next months and years" - Peter Jørgensen (Boozt)*

With these predictions, operations can be planned accordingly. Thus, keeping costs of administration such as the number of employees at the correct level makes the company deliver on sales effectively while keeping costs down. Another way of keeping costs of administration is to automate certain processes. Adeline Sterner (Kids Brand Store) describes, *"Since we started being more data-driven, we have managed to cut costs by removing certain roles which instead can be automated."* Person C (Company C) exemplifies this with a machine learning use case lowering administrative costs, *"Categorization of articles on our websites is now classified with machine learning, allowing our articles to be classified, for example, rustic and Scandinavian with a certain color."*

Person C (Company C) further explains that this allows them to decrease cost and improve categorization, as the machine learning algorithm does more precise work than employees manually categorizing.

Another cost of running an online retailing site is caused by providing customer service. Magdalena Lindh (Adlibris) describes how their development in BI&A has created a better understanding of bottlenecks in their operations. Rickard Johansson (CDON) describes a use case of analyzing past data to decrease customer service cost: *"Customer service decides on the number of working hours to be put in, based on the number of customer requests. This is based on prior data, which makes them keep control of employee costs"*. This analysis of past data on the number of requests and time it takes to answer the requests enables CDON to limit the number of workers in customer service being too unoccupied at work.

4.1.3 Warehousing and logistics efficiency

An online retailer needs to store its products. Storage can be done internally by operating a warehouse or by letting a third-party store the products. When operating a warehouse, the retailer needs to run warehousing operations as efficiently as possible to keep the associated costs down. In warehousing, as with customer service, the number of employees needs to be adapted to demand and sales, as Person B (Company B) describes:

> *"The staffed hours in the warehouse are based on the forecast of sales ahead. If the forecast turns out to be far from the actual sales, then either the products will be delivered late to the customers due to lack of personnel or the other way around, our personnel doesn't have enough to do, bearing unnecessary cost for our company." – Person B (Company B)*

As mentioned by Rickard Johansson (CDON), this type of forecast also applies to logistics: *"The logistics function has a good understanding of which and when products will sell. This is then supported by adding additional trucks, so we are able to deliver to the customers".* While forecasts can support the planning, it does not help the efficiency of the actual work. Several interviewees have described the use of different metrics measuring the efficiency of the warehouse operations requiring data and analysis.

> *"One of the highest costs for us is those associated with the logistics of the product. To continuously monitor those costs, to see the change of, for example, how effective we are at picking and packing the product and then to take action to improve the processes is essential" - Esko Österbacka (Bubbleroom)*

> *"It is very valuable in the warehouse to optimize different processes such as where the product should be placed. Preferably having the ones being sold the most, closest to the packing stations, to decrease distance for pick-up. And also, to optimize how large the packaging to different orders should be, so that not too much air is paid for" - Adrien Mathieu (Nelly)*

Several companies interviewed work continuously trying to streamline warehouse processes to cut costs and improve delivery speed. E.g., Boozt has automated processes in the warehouse, using robots and a warehouse management system. Peter Jørgensen (Boozt) describes their warehousing operations:

"Basically, the warehouse is close to being automated, having around 600 robots picking items. The use of robots takes some cost out of the system. The robots work very fast and all around the clock, cutting costs but also decreases the time from picking to delivering to the customer. In this, the data is essential." - Peter Jørgensen (Boozt)

4.1.4 Decrease returns

Returns of products bear a substantial cost for online retailers, as they often pay for transportation and the costs associated with inspecting, repackaging, and reselling the product. How high the cost is and, consequently, the priority to lower returns depends largely on what type of product the retailer sells. For example, Adlibris selling books describes having a small number of returns on sold products, hence a small effect on their bottom-line result. In contrast, several of the interviewees representing online retailers selling clothes describe the opposite, where returns are associated with high costs. While the importance of decreasing returns varies, almost all interviewees apply analysis to decrease returns. The different analyses the retailers use to decrease returns are by identifying and managing; characteristics of products being returned; issues leading to returns; and certain customers excessively returning products. Esko Österbacka (Bubbleroom) describes one example of how they analyze product returns in terms of product characteristics.

"We have certain products that we analyze when it comes to returns. For example, certain dresses need to fit perfectly, not to be returned, while other dresses are more forgiving in terms of perceived fit. This gives us information on returns and with that the actual cost of a product, when adjusted for the return cost of the past. This guides our pricing of that specific product and whether the product is profitable or not. This information then guides our purchasing department on what to buy and what not to buy. From that analysis, we can see that, for example, a certain dress is returned too often, making it non-profitable, which makes us exclude it from the overall assortment. If it isn't important to have it in the assortment for another reason" – Esko Österbacka (Bubbleroom)

Adeline Sterner (Kids Brand Store) describes how they try to identify reasons for product returns and how these insights drive actions to decrease returns.

> *"We look at what categories are being returned to most. Of the products that are being returned the most, we try to find the underlying reason/s. Often, it is simple things such as the product being wrongly stated as small in size or the picture showing a certain color of the garment not representing how it looks in real life. When we have identified the reason, we try to correct it." – Adeline Sterner (Kids Brand Store)*

Some returns can be explained with product defects or inaccurate demonstration, but not all returns. Several interviewees explained that through customer data analysis, they have identified that certain customers buy excessive amounts of products knowing that they will likely return them, as the return is free of charge. In this case, the analysis is made on the individuals instead of the product. When the customers misuse the free returns system, actors have taken different actions, for example, by banning these customers from making purchases, making sure not to advertise to these customers, or by giving out warnings.

4.1.5 Optimization of purchases and stock

Managing purchasing and stock levels are essential for an online retailer to deliver the right products at the right time efficiently. Further, it is essential for retailers with their own warehouses to sell the products as quickly as possible, to decrease the risk of long-term storing products that lose value, and to make room for other products in storage. If certain products do not get sold, direct losses in the form of lost sales and indirect storage costs arise. Products that do not sell will lose value if they become outdated technically, style-wise, or expire and likely must be sold at a lower price. To decrease the number of products not getting sold, several interviewees mention applying analysis on product sales data to early identify products that should be decreased or cut from purchases. By doing so, the interviewees describe that it lowers the costs of product obsolescence and more effective use of invested capital, as less capital is tied to stored products. A large part of the interviewees further describes having predetermined levels of automated purchases, triggering new signals of purchase when stock levels of certain products reach below a certain number. Göran Sällvin (Pierce) describes one example of this *"In terms of the supply chain, we have a system in place which predicts what purchases we should do, based on how the sales of the products develop. It helps us minimize the risk of having empty inventory".* While one of the main objectives of the purchasing departments of the online retailers is to optimize the purchases to meet the demand, a few interviewees mention the use of BI&A for improving coordination of cross-functional activities. Since the marketing department wants to market products that the customer is most likely to buy, the company must have the right products in stock to deliver. To make sure that this is the case, Person B (Company B) describes how they use data to increase this coordination.

> *"We have data on stock balances of all products together with their coverage of sizes. Before deciding on pushing certain product to potential customers through marketing, we make an analysis and check that we have a good stock balance and coverage of sizes." – Person B (Company B)*

Capacity coordination can also involve other activities such as measuring and understanding capacity in logistics. A few other interviewees have additionally stated that the coordination of the capacity of the company and the marketing activities should align, not only on stock balance but also on logistics, such as the ability to pack and transport products.

4.2 Increase sales

Increasing sales in an efficient manner were described to be, at least, equally important as running the operations as efficiently as possible. For some, increasing sales was more of a priority than efficiency, as bigger market shares can create a higher bargaining power towards suppliers which can result in lower prices and positively affect customers' choice of store. As mentioned in 4.1, online retailers commonly have high direct costs per order and often pay third parties to generate traffic to their site, e.g., with Google. Since these costs directly impact profitability, it is essential to manage these costs and other activities aimed at generating sales as effectively as possible. Some of the efforts described by the interviewees involve keeping track of and increasing the average order value, conversion rate, traffic to the site, customer satisfaction, and creating other revenue sources with data. Almost all interviewees describe that the traffic to the site, conversion rate, average order value, and customer retention often are correlated with customer satisfaction to form the overarching metrics for sales. For example, the average order value was described to be of great importance since some of the costs associated with each order were fixed, e.g., packaging and transportation. When the average order value increases and the associated order costs stay the same, the profitability goes up. Similarly, the conversion rate directly influences how effective each marketing channel is. By getting more people who enter the site to buy, more sales are generated with the same marketing spend, creating higher profitability. For these reasons, BI&A is used to increase sales, and the metrics mentioned previously, and described in the following sections: 4.2.1 to 4.2.5.

4.2.1 Average order value

According to all of the interviewees, one major factor to increase profitability, and for many, a key performance indicator closely followed, is the average order value of each customer. Analytics are used to increase what each customer spends on each order by making products more accessible, personalizing the content, and lowering friction. Increasing the average order value was exemplified by actions to nudge the consumer

to spend more by making product recommendations or displaying certain products in an order that will have a higher likelihood of being purchased.

> *"The site must be designed so that the customer finds what they are looking for, but preferably also make sure that the shopping cart is as large as possible. As an online retailer, this is essential because, unlike an offline player, we have a shipping cost to take into account, and the shipping is often fixed in relation to the shopping cart, so the larger the shopping cart, the more money we make" - Person C (Company C)*

As exemplified by Person C, increasing the average order value can help to lower operational costs. Handling and shipping goods constitute a large portion of total costs for many actors and are often free of charge. By nudging the customer and making solid product recommendations, the number of transactions could be decreased while maintaining or increasing the revenue per customer. As in some cases, the recommendations lowered the likelihood that a consumer made a second order due to forgetting a particular item during the first transaction, eliminating additional shipping and handling cost.

By analyzing the customer's current site usage and previous browsing history, product recommendations can deliver relevant product listings. The personalized content was used to nudge the customers closer to purchase for an increased average order value. Interviewees all expressed that the systems used for product recommendations use machine learning or AI with a varying degree of sophistication in parameters used and recommendations given. The model for making recommendations uses data on real-time consumer behavior and previously gathered data on individual consumers, and the software reacts as the shopping habits change. Although, recommendations are often not made on an individual level. Personalizations were, in many cases, limited to a certain number of segments, in which all customers were categorized. The output in the recommendations then adapts to these segments and is displayed accordingly. The recommendations were described to have lower accuracy when low amounts of data are available for a specific consumer. As data on first time-visitors is limited, the categorizations and following recommendations are less accurate it could return a lower average order value. However, segmentation could be done more accurately by using segmentation on so-called twin profiles or behavior profiling, as expressed by Esko Österbacka (Bubbleroom) and Peter Jørgensen (Boozt):

> *"As soon as they can identify you or find a twin, they categorize you according to these attributes, and then your product feed is customized." - Esko Österbacka (Bubbleroom)*

> *"If it is a new consumer, you have less data. On the other hand, if you collect the behavior, let's say the clicks and things that have been watched, we catch that, which enables us to calculate what would be the most likely brands or styles that the consumer wants to see." - Peter Jørgensen (Boozt)*

The personalized content was displayed differently and to varying extents. Using a module for product recommendations was commonly mentioned, limiting the recommendations to a particular portion of the page. In some cases, entire product listing pages were personalized, and products that suit the customer's profiling were displayed higher in the list. In other cases, the algorithm was expressed to make recommendations on compliments to a specific product to increase additional purchases.

> *"Recommendations are often made already from the product site, by presenting relevant accessories or to help the customer that, e.g., buys a sink to keep in mind that you also need pipes and hoses to install. Then when you get to the checkout, there are proposals for additional purchases. They are sometimes very good, sometimes less good. Depends on the algorithm" - Person C (Company C)*

To minimize friction for the customers, one of the interviewees had developed an add-on service for upselling that put products and complements on display that are compatible with a specific model or type of product.

> *"One of the great problems for customers is that there are so many different variants, that's the hard part. We have a function on our sites that we call fit-my-bike, which means that you enter which bike you have and we try to help people to find parts that fit." – Göran Sällvin (Pierce)*

Several interviewees expressed that shipment and returns constitute a major cost for the business and are often viewed as a pure hygiene factor that the consumer often expects to be free of charge. However, as two interviewees expressed, data and A/B testing enable the retailer to evaluate the effect different shipping prices offered to the customers have on the average order value.

> *"We have the advantage that we actually can test what gives effect. E.g., what happens if we change the limit for free shipping - does the profit of a larger shopping basket exceed the cost of shipping?" – Adrien Mathieu (Nelly)*

4.2.2 Conversion rate

Conversion rate, or the ability to convert a visitor to a paying customer, was one of the more discussed topics during the interviews. As many online retailers are selling products with low margins and high variable costs, every percentage increase in conversion can significantly affect profitability. As expressed by Person E (Company E), the website's design and features are crucial to make sure the customers find what they are looking for quickly and minimize friction when making a purchase.

A/B-testing was portrayed as a method used by almost all actors to increase the conversion rate. A/B-tests is the process of comparing a control version with another version where one element has changed. The incoming traffic is directed into the two different versions at random. A statistical test is then conducted and measured according to specific KPIs, such as the conversion rate. A/B-tests are used to try out hypotheses that increase the conversions rate, as illustrated by Person A (Company A):

> *"The tests are driven by hypothesis. For example, we should have as few clicks as possible to convert a purchase. We should present as little unnecessary information as possible, then do different tests. Should we have big pictures of clothes or small ones? Should the dumbbells be presented as heavy or light? This is how you measure changes, and in the end, you will see if there is an effect on sales. And so, it is assumed that it is possible to extrapolate the entire incubation." - Person A (Company A)*

Generally, driving and increasing the conversion rate is emphasized to be done by understanding the customer better. The logic behind the reasoning is that a better shopping experience, with less friction, will increase conversion and sales. To gain a better understanding of the customer analyses of the customer journey is made, as portrayed by Magdalena Lindh (Adlibris):

> *"Now we are in the process of mapping the customer journey. To see what types of customers we have, how they move, and their pains and gains. This is done to be able to see where we should invest. Identify where the quick efforts are that can solve a lot. So, the whole CEM team drives the whole issue of customer focus, in all parts." – Magdalena Lindh (Adlibris)*

As pointed out by several interviewees, a major value gained from using business intelligence is the effect that understanding and tracking the conversion rate has on managing customer acquisition and sales. Marketing efforts generate traffic and customers to the site, and the conversion rate represents the ratio of visitors converted into customers. The conversion rate forms a link between marketing and revenue which enables the marketing and sales divisions to coordinate and track their efforts to increase sales and decrease costs, as illustrated by Adeline Sterner (Kids Brand Store) and Magdalena Lindh (Adlibris):

> *"It makes it possible to say that 'we will need this traffic if we have this conversion.' Is it reasonable? Is it not reasonable? 'If we are to have this traffic with this conversion, we will need to buy this many new customers for this price.' Is it feasible? It is also highly dependent on what we have on offer as well. If we have 20% on everything, we have a completely different conversion rate than if we have a full-price site." – Adeline Sterner (Kids Brand Store)*

> *"It enables us to coordinate efforts better than from traditional reporting. I work, for example, on building traffic goals for our channels and the total. If our sales manager says, 'we will need to reach this sales target.' I can then respond, 'okay then but do we need to have this much traffic given that we have this average order value, and this conversion rate" – Magdalena Lindh (Adlibris)*

Several of the interviewed actors also use an automated tool to analyze competitors' price levels, campaigns, and assortments to check that their prices and assortment are optimal for their desired conversion rate, as explained by Adrien Mathieu (Nelly):

> *"I usually do not go to their website and calculate. It is impossible when they have ten, twenty thousand or more products. We use tools that track all products on different websites, and then you can directly see discounts, average price, how many different products they have per category" – Adrien Mathieu (Nelly)*

In some cases, these benchmarks are made on several occasions each day to keep the price levels on a competitive level, as portrayed by Person C (Company C): *"we have a system that scans what our competitors' prices are, and we try to match the lowest price. It happens up to five times a day."*

A few actors mention that analysis is made on newsletter effectiveness to track which brands, ways of communication, or offers reflect a higher conversion. An implementation that resulted from analyzing the newsletters had been done by Company E that send a reminder to customers on items they previously have looked at or put in the shopping bin that had not resulted in a purchase.

Also, one interviewee mentions tracking the website speed to ensure that the server's response time keeps up with the traffic. As illustrated by Niklas Dahlquist (Dahlquist), many e-commerce actors are implementing a new coding technology PWA, progressive web apps, which can have a significant impact on conversion rate.

> *"We see that a lot of large e-retailers are switching to PWA. I know, for example, that AliExpress doubled their conversion rate when they went to PWA. So, you pay the same amount for traffic, but you sell twice as much, so it's an extremely good investment." – Niklas Dahlquist (Dahlquist)*

4.2.3 Customer retention

Increasing customer satisfaction will give a higher customer retention and consequently was expressed as highly important. Keeping loyal customers will reduce marketing expenses, as loyal customers help acquire new customers, and acquiring new customers generally requires severely more investment than retaining and communicating to an established customer base. Emil Thell at Jollyroom explained that building customer satisfaction and loyalty drives traffic to the site organically, which requires no marketing investments. Using BI&A specifically to increase customer satisfaction was expressed as an area with the potential to return high value and explicitly as the primary value-adding area for one actor.

Analytics were expressed to be used to track customer satisfaction in ways such as the feedback received from customers on their overall satisfaction after their contact with customer service or perception of the purchasing experience. Customer service performance levels were also tracked as they develop over time. Further, the staffing of customer service was expressed to be based on incoming requests in customer services. As expressed by Rickard Johansson (CDON), staffing is done by analyzing both real-time incoming requests and historical data on periods with a usually high number of requests.

> *"Customer service puts up its staffing according to how many customer inquiries come in and have a pretty good idea of when a lot comes in. Weekly or monthly cycles that you put your staffing according to." – Rickard Johansson (CDON)*

One of the interviewees expressed that they had implemented a system to prioritize customer service efforts to the most profitable customers, which was done by segmenting the customers in terms of order value. The segments were based on three different levels of order value, and five identified types of customers based on behavior. Customers were then attributed to one of these fifteen segments, which guided the company with actions towards each customer. The segmentation, he explained, guided customer acquisition and actions to customers that have higher profitability. Further, these segmentations also guided action by the customer service division to prioritize their efforts on customers with a better score on the segmentation:

> *"You kind of have this metric so that you can handle the good customers first and the less good ones after. By doing this you see that the happiness of the customer is increased" - Peter Jørgensen (Boozt)*

Analysis of the NPS, net promoters scores, which track customer satisfaction, were also mentioned by several interviewees to be used. The NPS could also be segmented to identify where efforts should be directed to increase the NPS and prioritize customer segments. An effect of tracking customer satisfaction has led an actor to implement a function that automatically updates prices on newsletters according to their current price level.

> *"If you, for example, search for 'iPhone 12', you will receive a newsletter with an offer on an iPhone 12. If you then wait two days or two weeks and then open the same promotional email, the price has changed according to price changes on the website. It is the new updated prices you will see" – Person E (Company E)*

Delivery times were stated as a hygiene factor, and deviating from promised delivery times negatively impacted customer satisfaction. Further, increased delivery precision also lowers the number of errands customers service receives. BI&A was used to track historical delivery times to enable more accurate promises of delivery times to consumers, and the historical data was also used as material for negotiations with suppliers.

4.2.4 Optimize traffic to the site

To generate sales, an online retailer must generate traffic to the site, and the traffic should convert into sales. Acquiring traffic can be done through existing customers or acquiring new customers. Acquiring traffic is, as stated, strongly correlated with marketing expenditures, thereby attracting lucrative traffic is essential. Attracting the correct type of traffic can be made more efficient by visualizing marketing data and helps to take appropriate measures, as exemplified by Adeline Sterner (Kids Brand Store):

> *"We see on each market from day to day how much we have spent, how many new customers and old customers it has generated. It makes it easier to choose how much we want to spend on new or old consumers, for example, on our exposure in Google Shopping. So, we can pretty quickly respond and pull the brake if our expenditures on traffic aren't lucrative." – Adeline Sterner (Kids Brands Store)*

Further, understanding the customers' search patterns, e.g., from Google, social media, and price comparison sites, can assist in creating a cost-efficient strategy for attracting

traffic. The more advanced and automated methods to optimize traffic and customer acquisitions are done through attribution models, which are accounted for in section 4.1.1.

Visualizing marketing data was also mentioned to help identify and understand demand, as illustrated by Person D (Company D).

> *"It's just a matter of finding the analysis and understanding what you want with the analysis. In this case, it could be targeted marketing. What do we sell to this zip code area? Here we sell more conservatories than in this store. Maybe you should aim more efforts there and ride the scales. Or why don't the others want conservatories? [...] So meeting the market is one of the keys to success for us." – Person D (Company D)*

Increasing traffic through existing customers is mentioned to be done mainly through newsletters and mailings. To increase the conversion of the newsletters, interviewees use different segmentations based on time intervals and previous purchases.

> *"We segment our customers based on a customer journey. You want to segment customers, so you don't send the same newsletter to everyone. E.g., it can be a customer who has bought a product but then there has been no repurchase in 3, 6, or 12 months. [...] And there are good systems also where you can build these customer journeys and then say, 'if this does not happen within a certain time, you send this offer,' and so on." - Esko Österbacka (Bubbleroom)*

4.2.5 In-house marketing sales

A unique feature that only one actor has implemented is to create add-on services to suppliers based on their business and customer data. The service consists of a team working together with some of the most sold and popular brands and using data to assist the product development for new season launches, for which they charge the supplier.

> *"We have something that is called Boozt media partnership. That is a small team of six-seven people that sits and orchestrates data and literature to build media plans for our brand relations. If we have Tiger as a brand, and we have built up 250.000 customers that buy into Tiger, then obviously the Tiger brand thinks it's interesting to work with that team when they launch new products to season." - Peter Jørgensen (Boozt)*

Further, the suppliers can purchase personalized advertisements on the website to reach a target audience.

> *"Instead of launching it broadly, you go to the target customers that caters to and love your products. So that's a way to kind of work with data, in a very smart way and in a way where you make money. [...]You can send emails and show banners on the site when the customers are coming on the page. Instead of showing them a broad communication, you can tailor Tiger communication or have Tiger material, which makes sense for us as a brand and for Tiger as a fashion brand. The smart way of retailing and using data [...] It's really nothing different from in the old days when you went to physical stores, and you saw banners in the window, material that they cash in. A campaign like that is often sponsored or paid for by the brand. That is the physical way of doing it. As I just described, the online way is where you can use the data and tailor content to the consumer and then monitor its effect. Then you have built a strong machine based on insights and data, and obviously, you can leverage that, and then you can ask for money." - Peter Jørgensen (Boozt)*

This service nurtures both the supplier and customer relationship and acts as a source of income, as explained by Peter Jørgensen (Boozt):

> *"It's value-adding both from a business perspective, as in making money, but also from a relational perspective to the brands that we buy goods from. You want to be a preferred player to them if you can. Not just us buying from them, but also in us helping them become better. Better brands for the customers that cater to those brands. So those two areas are not easy to solve, and they are of extremely high value." - Peter Jørgensen (Boozt)*

4.3 Competitiveness of business

To survive and create long-term profits, an online retailer needs to perform more than actions to increase sales and manage costs. Tracking and managing the brand, positioning, adapting to customer demand is vital for sustaining competitiveness. Several interviewees raise these topics for successfully running an online retailing company. The interviewees explain that matching the assortment to demand, both today and in the future, coupled with branding, is crucial. Further, identifying target customers and tailoring the offerings to match their demand with the right price level and at the right time is describe to create long-term competitiveness. Some customers are, through BI&A, identified to be high-value customers based on their past spending, low return pattern, or general lifestyle. The following sections, 4.3.1 to 4.3.3, describe how these goals are attained.

4.3.1 Value segmentation of customers

Several actors use BI&A to understand the potential revenue different types of customers likely will bring the business, which enables easier coordination between divisions and the companies to understand how much they should invest in acquiring and converting customers. Understand the expected lifetime value of a customer help marketing to balance investment in acquiring new customers and retaining existing customers, and at what point in time efforts should be made, as illustrated by Adeline Sterner (Kids Brand Store):

> *"If we take marketing as an example. There we are very data-driven and measure cost per new customer, which channel they come in from, and so on. It is a way to know how much we are willing to spend on a new customer. Then you also need to understand how long a customer lives and what the customer lifetime value is. This helps us decide if we want to be profitable on the first purchase, or maybe we should be profitable only at the third purchase." – Adeline Sterner (Kids Brands Store)*

Further, finding similarities and segmenting the customers with similar behavior and understanding what increases their expenditures enables more accurate and focused efforts on target groups, as explained by Adrien Mathieu (Nelly):

> *"We collect data and try to allocate a cost, the customer acquisition cost in relation to what the sales for that customer became. Actually, what you are doing is calculating the customer lifetime value, which can be very simple or very complicated. Find and group those customers who have a high average order value or order frequency and try to understand what they want. It is important to recheck the results when returns by customers are done. At that time, we can finalize our analysis" – Adrien Mathieu (Nelly)*

Several interviewees stated that they use analytics to identify key signs of high-value customers by analyzing their customers to find those with the highest expenditures and analyzing their purchasing behavior. For example, two actors could conclude that there were similarities in the first purchased product by high-value customers. Thereby efforts can be made to acquire customers with similar needs as explained by Göran Sällvin (Pierce) and efforts to retain them according to their shopping patterns, as illustrated by Emil Thell (Jollyroom):

> *"We try to look at, for example, which are the customers who stay with us over time and buy often? What products do they buy? What were the first products they bought? And so on. This helps us to understand where the probability of bigger profit increases. [...] For example, customers who start buying spare parts from us tend to stay with us for a long time and are quite frequent customers. Then we try to think about how we can do different activities to get customers to start buying spare parts." – Göran Sällvin (Pierce)*

> *"92% of our customers are women, so we always talk about 'her' when we talk about the customer. We try to take her in when she's pregnant. We understand that she is pregnant by, for example, her buying a pregnancy book from us. So, we can conclude that 'here we have a customer who is expecting a baby.' Then we know that we potentially have a 10-year relationship with this customer in front of us. Then it is really important to manage it as well as possible, and make sure that she receives good offers, at the right time." – Emil Thell (Jollyroom)*

One of the interviewees was in the process of implementing a predictive analytics model to identify customers that spend a lot, what they purchase, and then send automated and personalized offers to that target group.

> *"What we do is directly personalized. With different types of mathematical models or analysis models, we try to predict the type of offer that you, as a customer, would buy. [...] It's about really trying to understand what type of customers are the ones who buy what. We can see, for example, that these are the ones who bought the most from us and whom we see have a high share of wallet, these people buy a lot. Then you try to find different variables and look at, you do a bit like a twin analysis, you try to find and understand which customers are just like these customers. [...] Then it's about how we should build our communication to nudge the customer closer and closer to a purchase." – Person E (Company E)*

4.3.2 Branding, positioning, and assortment

Many interviewees described using different analytic tools to manage business areas and product portfolios according to changing customer demands. Data is gathered both internally from customers' behavior and search trends and externally from different sources. Göran Sällvin (Pierce) illustrates how they use different external sources to identify potential new markets.

> *"For example, we work together with Google, where we look at how search trends are going in different markets, where there seems to be a demand. Then we review which markets we should be on. [...] For the analysis, we also collect data on registered motorcycles. Even though our market is growing faster than registered motorcycles, it is a pretty good correlation with how many motorcycles there are and how big the market is." – Göran Sällvin (Pierce)*

External data is further used to track how well certain products are selling and to find products outside the current product portfolio that might be worth incorporating, Rickard Johansson (CDON) explains. Additionally, internal customer data directs actors' supply and assortment in lucrative product categories. Indication of changes in demand can also reflect in designing the website and building content adjusted for customer demand, as exemplified by Magdalena Lindh (Adlibris):

> *"Insights will reflect in web development. For example, if we notice 'well it seems that the majority like children's books.' Yes, but then the site team that works with web editing has created and developed the children's book page." – Magdalena Lindh (Adlibris)*

Increased demand for a specific product or category has automated signals that trigger purchases. However, for all the interviewees, the strategic decision regarding new products and categories of markets also requires manual analysis. Several interviewees also mention that they use tools or have partners that help them track brand recognition and social media growth and engagement.

4.3.3 Pricing strategy

A few actors explained that they use flexible pricing to increase the average profitability of sales based on demand. For example, historical data on seasonal customer demand can trigger a price increase during the period when there is an expected demand increase. Another interviewee mentioned a trigger for when a particular product may get a price increase. This trigger is based on the competitor's ability to supply the same product. When a competitor lacks product inventory, it can trigger a price increase of the same or equivalent product on their website, which enables them to capture a higher margin, as illustrated by Person D (Company D):

> *"Our assortment team monitors competitors closely. For example, the bathroom category is very price-sensitive, so we have to be in line with our competitors to have a chance. In that category, we have pretty low margins. However, now during the pandemic, the supply of goods is as chaotic as ever. Therefore, we have one person in the assortment team who is constantly looking at our closest competitors' delivery times. Should it be the case that we have the opportunity to deliver when they can not, we also have the opportunity to increase our prices. So, we make sure that we're constantly meeting the demand." – Person D (Company D)*

Another interviewee explains how they use internal inventory levels coupled with Google search trends to assess an appropriate price level.

> *"But the big gain if we talk about data is to combine the data from different data sources, for example, by linking the Google information with our inventory levels. There you can draw a number of conclusions. [...] If you have a very high demand for a certain product, it can control your pricing based on how much you have in stock." - Emil Thell (Jollyroom)*

4.4 Online retailer ambidexterity

This section describes how the online retailers are organized for using BI&A and goes on to describe how the interviewees perceive that BI&A helps them to exploit and explore.

4.4.1 Organizational structure of BI&A and explorative and exploitative activities in online retailing

The majority of firms were organized in a contextual arrangement with no separation between explorative and exploitative units, thereof units conducted both exploitative and explorative activities. Units were separated into traditional functions, such as marketing, sales, purchases, logistics, finance, warehousing, web development & support. It was clear that the interviewees viewed BI&A as their primary source to improve and gain a competitive advantage, while there was a clear emphasis on improving the existing business over finding new opportunities. Units were described to have a somewhat similar responsibility for exploitative and explorative activities. While insights gained at lower-level units usually traveled upwards in the organizational hierarchy and converting the insights into actions involves multiple functions, as illustrated by Person C (Company C):

> *"Data analytics usually touches on many functions. Most often, the data collection originates in the online team, those who originally work with online marketing. [...] Then it touches on our more financial organization, business controllers usually. For example, if you sit and work as the online team does, for them, it may be enough to see a trend or direction in the data, but again we must communicate it, and it must be described in a different way and be more accurate." - Person C (Company C)*

The majority of respondents did not have a separate unit for BI&A, but instead, the units had gotten an increased number of BI&A activities incorporated in their roles and responsibilities. In many cases, as for Company A, Kids Brand Store, Jollyroom, and Company D, the role of CFO and CMO, or roles in close relation to these, such as controllers, were expressed to have a big responsibility of using BI&A tools to find room for improvements and meeting the budget, as exemplified by Emil Thell (Jollyroom).

> *"Foremost, we have a controlling team, as we call it. It is perhaps a more traditional designation for it, but the role is moving more and more towards data analysis rather than traditional financial controlling. The longer the time passes, the more data analytics there will be in this team. And it's really a kind of coordinating central function for this area. Then as I mentioned, we also have people who work exclusively with Google analytics [...]. And it's a separate marketing team." - Emil Thell (Jollyroom)*

However, a few of the biggest firms, such as Adlibris, Company E, CDON, and Boozt, expressed that they had or were in the process of building an in-house analytics team with the responsibility of finding new ways of leveraging the data to create business value. In some cases, these teams get requests from other units, which have an idea for a new model or process, which the analytics team implements. However, implementing BI&A insights into action was conveyed to almost always involve some degree of cross-functional teams, regardless of the firm had a separate BI&A team or not. The analytics process is clearly illustrated by Kristina Lukes (Nelly) and Peter Jørgensen (Boozt).

> *"Being data-driven is about looking at data, small and large, every day on many different occasions to make wise decisions. You have a strategy and direction and analyze what and how you can influence the KPIs. Here, you have the space to make those decisions yourself according to this mandate. In a process-oriented organization where you work in processes, it's about cross-checking data and looking at the data from slightly different perspectives. We are building an insight, or an analysis department that goes cross-functional. It is not enough to sit in the operation of the warehouse and look alone at the data you have, but you need to cross-reference it in different places in the organization to get insights and "AHA" experiences." - Kristina Lukes (Nelly)*

> *"Basically, the business will have an idea that could be solved, and then they will include the data scientist team to figure out how that can be done. Then they analyze that we have data to support the idea and then build a logic around it, and that is normally how it is done. On the other hand, the data scientist team sees a lot, so they are also very business-minded. So, if they see that they can strengthen areas of the business with something, they will. So, it works in both ways." - Peter Jørgensen (Boozt)*

Formal cross-functional meetings were described to be used, often daily or weekly meetings, to track KPIs and performance in relation to goals and targets. Meetings were described to assess and evaluate performance compared to forecasts and budgets and take action in cases of underperformance. New business opportunities or identification of new areas of improvements were described by some to surface ad hoc and by others as a continuous process, as described by Kristina Lukes (Nelly):

> *"The basis for the analytics team is about delivering against the strategy we have. And in it lies both the continuous improvement work, but also identifying new business opportunities. So, the mission of the analysis team is both" – Kristina Lukes (Nelly)*

Further, in one case, for Adlibris, where no formal cross-functional analytics group had been formed, an informal group had emerged, as explained by Magdalena Lindh (Adlibris):

> *"People from different departments that in one way or another work with analytics try to join forces and help each other as much as possible. We have a newly started group for CEM, customer experience management, where we have CRM and customer analysts. We have me sitting on the market side as a web analyst. We have a business developer on purchases. Then we have our BI team that sits on IT, working on the business system and all those connections. So yes, there is a group, but it is self-created." – Magdalena Lindh (Adlibris)*

4.4.2 BI&A supporting exploitation

Several interviewees described that the benefits of using BI&A reflected not only for individual cases of business improvement but also by aiding processes within functions and facilitating cross-functional operational improvements (exploitation). A few interviewees mentioned issues of not knowing how actions and changes made affect their unit's performance and the overall business. Further, some explained that even though various KPIs existed, continuous follow-up was too far apart in time to make it possible to distinguish what change or actions resulted in a positive effect on the business. To resolve this issue, shortening the feedback loop and making it possible to see how individual changes made a difference. Several interviewees mentioned that having a function or person responsible for providing daily reports by compiling the data on how each function's performance had been in relation to the set goals for the KPIs to the different functions facilitated better assessments and faster changes. One example was CDON that has a person responsible for BI, creating and sending out daily reports, as Rickard Johansson (CDON) describes:

> *"We have reports that are being sent out on a daily, weekly, and monthly basis. Basically, they are summaries of what has happened. With the reports, you get a feeling of how the business is going. When viewing where the KPI's and numbers included in the report are pointing, you are able to draw insights and dig deeper in your analysis on what should be done ahead. [...] It's hard to say how much value this generates for us now that these processes for reports are standardized but, I would say that without these reports, we probably would be out in the dark on what happens and draw conflicting conclusions one week to another, having a hard time creating consistency and long-term improvement." – Rickard Johansson (CDON)*

A few other interviewees describe that the ability to test things and get feedback from the daily reports facilitates a culture of improvement within each function. A/B testing was used to shorten the feedback loop further when testing new ideas. As described in earlier chapters, the possibilities of using A/B testing create value in many areas, for example, by testing of product assortment, website, newsletter, and marketing channel

effectiveness. The prerequisites for conducting A/B tests are that data can be collected and compared before and after changes have been made. Several interviewees describe the use of A/B tests as an essential tool to create improvement in a data-driven way which cannot be done without gathering data and usage of BI&A.

Another issue raised by the interviewees that counteract the ability to create continuous improvement was that different functions use to widely separated KPIs. Generally, functions are working against common references such as the budget, which the KPIs reflect. However, in many cases, the functions have targets and track improvements that cannot be translated into revenue, or there are differences in terms and language used between functions. Some interviewees described how this could cause problems in communicating between functions and aligning targets and goals. By creating high-level KPIs that can be broken down into function-specific KPIs, or by creating KPIs cross-functionally, this problem could be overcome, as illustrated by Magdalena Lindh (Adlibris):

> *"Just the fact that finance talks about billed sales, which we who work with channel performance cannot do. We cannot calculate or optimize on that, so then we have to get the two things together. Since this is precisely what we have had problems with, we have created something we call the target compass, where we sit together with purchasing, sales, CEM, and market and set common KPIs to understand what it is we should optimize towards? And why? For example, we can be minus in sales and plus in traffic. We need to speak the same language so that we understand each other." – Magdalena Lindh (Adlibris)*

Closely related to the problem with conflicting KPIs, a few interviewees explained having issues of getting an overview of other functions capacity, creating coordination issues, and consequently using unnecessary resources. Magdalena Lindh (Adlibris) exemplifies

> *"About a year ago, it did not go that well for Adlibris. We stood in the middle of Christmas shopping time, unable to deliver. People bought products from us at Black Friday that we later delivered in February, which to some extent was due to us not being data-driven, making us unable to understand why things went a certain way and how we should act ahead. This has now improved, where we are much more data-driven all the way to logistics. Now we know, for example, when to increase marketing spend due to having capacity in logistics and when not to due to incapacity." – Magdalena Lindh (Adlibris)*

Several other interviewees explained similar issues of not knowing exactly how other business units perform, thus making it difficult to coordinate their efforts efficiently.

Many interviewees explained that using BI helps to make the data understandable, correct, and available between functions, and thus the issue of coordination can be better managed. This action is by several interviewees explained to effectively create touchpoints between units, guiding decisions daily in different functions that are for the best of the entire company and not only a particular function.

4.4.3 BI&A supporting exploration

As mentioned, no actor has implemented any structural separation where a unit is solely responsible for exploratory activities. Instead, exploratory activities were incorporated into the roles of employees. Even though there was a clear emphasis on exploitive activities over exploratory, there were still some examples of how BI&A aided the exploratory process.

The foremost mentioned way that BI&A tools facilitated the exploratory process was the possibility to play and experiment with visualizing data in different ways. By presenting the data in new ways, new insights on, e.g., the potential for increased sales in product categories, or identifying new demand.

> *"Since we have the data in our database, by asking the right questions, I can basically get what I want. Most recently, today, I looked at uptake capacity per store in the form of zip codes. When you connect a store to a certain amount of postal code, you see what the possibility is of reaching out, how many customers and homes are there in these areas. So, I feel that I can get all the data I really want. It's just a matter of finding the analysis and understanding what you want with the analysis. In this case, it could be targeted marketing. What do we sell to this zip code area? 'Here we sell more conservatories than in this store, maybe you should focus more there and ride the scales, or why do the others not want conservatories? Is it that it is too hot, you are rather sitting outside? So, meeting the market is one of the keys to success for us." - Person D (Company D)*

Further, as customer demand changes over time, the BI&A tools could automatically signal when demand increases for certain product categories. These signals give employees indications that the assortment in these product categories potentially should be increased, decreased, or changed.

Besides experimenting and testing, BI&A tools were not conveyed as extensively used for exploratory processes. However, the interviews showed that the companies with a BI&A function or team were the ones who conducted exploratory activities continuously, and also the few who had realized new business areas.

Access to extensive customer data and the capabilities of analyzing and interpreting the data had led one actor, as mentioned in section 4.2.5, to start a new business area. Even though the actor did not intend to start a new business area, it emerged from using BI&A and understanding the value their data can create for other parties.

5
Discussion

This chapter analyses and relates the study's findings to the academic literature on BI&A, ambidexterity, value, and competitive advantage. The chapter is divided by the study's research questions, 5.1 referring to the first research question and 5.2 to the second research question.

5.1 Value creation of BI&A by B2C online retailers in Sweden

The results show that the primary sources of value gained from BI&A are improved operational efficiency, increased sales, and competitiveness of the business. Value is presented as the perceived value conveyed by the interviewees. No measurements have been made on value, as in economic benefits gained, as it was outside this study's scope.

The value creation process of analytics seems to be in line with Seddon et al.'s (2017) business analytics process model. The use of analytics resources leads to insights that influence decisions that either change the organization's existing resources or through existing resources to create value. The results show that in some cases, the analytics resource used leads to insights that result in actions that end as an improvement of the three value segments. E.g., such as the analysis of customers, which may lead to new insights on customers preferences or products to include in the assortment. In other cases, the analytic method used has a direct effect on said value themes, such as automated product recommendations that are continuously done with machine learning algorithms, which eludes the insight-to-decision stage. However, one could argue that decisions are made through the algorithm, and in that case, the model is comprehensive for the process. Concerning what influences the decision to create value by using existing resources or changing the organization's resources, no conclusion can be made. However, it can be stated that a clear majority of decisions leads to changes in the form of actions using existing resources, which can be expected as using the existing resource base requires less effort.

With this said, there are differences in the codes/actions included in the results and the level of sophistication and automation of the business analytic methods and tools used. Certain codes are rather simplistic in the level of automation and could constitute as data collection and presentation, which then employees or analysts evaluate as material for actions. Other examples as attribution modeling can, as explained, incorporate a very high level of sophistication depending on the precision and number of factors

considered in the calculation. However, the perceived and expressed value does not convey any correlation to the level of sophistication or amount of data used. Instead, the most elemental analysis was in many cases displayed as the most value-adding, as with aligning key performance indicators between units or shortening feedback loops. This was especially illustrated by the firms that had not, in relation to others, made considerable progress in implementing BI&A. That the most elemental analyses give high value seems to align with Vidgen et al.'s (2019) statement that relatively simple analyses that may use small amounts of data can create substantial business value. The perceived value gained from a new BI&A activity seems to be related to what has previously been exploited through BI&A, rather than how sophisticated the model is or how much data are being used. However, Davenport and Harris (2017) state that the level of sophistication in the analytic methods used directly correlates to the possibility of it giving a competitive advantage. This could indicate that several of the firms with a lower level of sophistication and advancements in their BI&A tools cannot attribute their position as one of the biggest online retailers in Sweden to their BI&A capabilities. Rather, their position could be obtained from other sources, a lack of competition, or purely that the competition lags even further in implementing BI&A.

The focus on improving operational efficiency to lower costs and increasing sales is in line with what the literature described as a major value driver for using BI&A (Akter and Wamba, 2016). However, Sorescu et al. (2011) argue that the focus in retailing should shift from what retailers are selling towards how they interact and sell to the customers to sustain their competitive advantage. The results indicate that BI&A primarily helps to keep costs down rather than improving the interaction with the customers. In some cases, increasing the sales involved creating a better customer experience and improving the interaction, while the focus is primarily on making the customer buy more frequently and for larger amounts. Increasing purchase frequency and the average order value was done by, for example, nudging the customers through twin analysis and increasing conversion through A/B testing. Where product recommendations and add-on services improve the customers' ability to find what they are looking for and propose additional complementary products, it might not create a competitive advantage, especially since almost all interviewed companies offer similar services in terms of product recommendations. These services do, however, create customer value by increasing customer efficiency through easier and smoother interaction. Further, it can be argued that lowering costs and increasing sales enables the online retailer to offer lower prices on products, which reflects in customer value while not necessarily improves the interaction. So it can be stated that the primary target value of using BI&A has been aimed at improving the profitability of the business by decreasing costs and increasing sales, not by improving the customer experience.

Increasing the competitiveness of the business was, similar to increasing sales and improving operational efficiency, explained to primarily improve profitability. The main focus of leveraging their available data to improve competitiveness was to find the right customers (the most profitable), appropriating value through add-on service to

suppliers, and exploiting competitor's inability to deliver. While BI&A improves the online retailer's sales and profits, it does not necessarily create a competitive advantage through a better customer experience. Instead, these actions enable the online retailers to effectively target the most valuable customers, increase sales through up sales, and leverage customers' willingness to pay by exploiting competitors' lack of coverage.

While sparsely covered in an online retailing context, the value from big data and analytics has been described to include faster and better decision-making, cost reductions, and new types of product offerings. This study shows that cost reduction is one of the largest areas of value contribution together with increased sales. As mentioned, better and faster decision-making is also achieved through the gathering and visualization of data and A/B testing, applicable to a wide range of business areas. A new area of value found was the product offerings emerging from BI&A, as the inhouse marking service provided by Boozt. This new type of offering, now directed to the suppliers rather than the customer, was a direct effect of leveraging their data through BI&A capabilities. This new area allowed Boozt to both establish a better supplier relationship and create a new revenue stream. What stands out, and not previously mentioned in the literature, is how the use of analytic helps online retailers find the right customers and adapt the offering to their demand. Further, as described by several interviewees, value segmentation of customers creates more value than just the lowered costs for customer acquisition. Value segmentation allows the retailer to identify and steer the business offering to the customers that are most likely to want to buy the products and least likely to return them. Something that is not possible in traditional retailing without access to these amounts of data. Earlier, a retailer gladly accepted all customers interested in buying their products no matter what and how much they bought or returned. Today, with value segmentation, online retailers can provide offerings and marketing efforts to those customers that are more likely to be profitable in the long run. Furthermore, the possibility of leveraging the knowledge of the products, customer's projected needs, and competitors' inability are more extensive than before with the use of BI&A. This is made possible by the increased amount of gathered data and tools available to conduct the analysis. While retailers without online sales channels can adjust prices according to competitors' prices and availability, online retailers using BI&A can do this continuously and more accurately. Further, online retailers can, through the use of BI&A, offer products to target customers at the right time, and this precision, as described by Emil Thell (Jollyroom), can potentially create a long-term, high-value customer.

Several different units of online retailers are individually appropriating value from the use of BI&A with a varying degree of sophistication of the analytics. However, it is apparent from the results of this study that some parts of the online retailer's business are using BI&A to a wider extent. Marketing is brought up by all interviewees to be heavily influenced by the introduction of BI&A. Why the marketing function has gone further with their use of BI&A might be attributed to the fact that marketing is a fundamental part of any retail organization and that the access to marketing and

customer data in recent years have been made available by Google and other digital marketing platforms. Companies often have resource constraints and, therefore, are bound to prioritize their investments, both in analytics and in other parts of their business. As analytics of any sort requires structured data, it is likely, that areas that already have structured data either from external or internal sources will require less investment to get started and be prioritized. Further, as companies might tend to focus on their core business, which in the case of an online retailer involves acquiring customers, selling products, and running operations efficiently, it might explain why the use of analytics at the moment is heavily focused on decreasing cost, especially in areas where data to a large extent are available through Google. As described by Person C (Company C), 5-20% of total revenue can be attributed to marketing costs, thus significantly impacting the overall profitability of the online retailer. However, even though analytics focuses primarily on decreasing cost and increasing sales, it was apparent that several of the companies recently have or are in the process of widening their scope of analytics into various functions and by cross-functional work. This could be seen as some of the larger online retailers recently had introduced an analytics team and increased the number of BI&A projects. This development is likely to continue and accelerate the use and value appropriation from BI&A in online retailing.

Our interviewees further seem to indicate that taking the first step in using BI&A requires the most extensive effort, such as Adlibris, who, during the last year, had started the process of leveraging their available data and implementing BI&A in their processes. In their case, the preparative phase of choosing and sorting through their data to find what can potentially bring value was very time-consuming. The high initial resource requirements could also be correlated with the effort needed to acquire the capabilities needed to work with data and BI&A. As for companies that had progressed further in their BI&A endeavor, their processes of implementing new BI&A processes were continuous and required shorter time periods. The initial phase of getting started with BI&A can seem overwhelming and might deter companies with limited resources. To overcome the resource requirements of starting an internal BI&A endeavor, a few of the smaller companies, seen to total revenue, had outsourced some of their BI&A activities, e.g., as their attribution model activities.

5.2 BI&A influence on exploitative and explorative activities and ambidexterity

Similar to what is mentioned by (Akter & Wamba, 2016), the interviewed online retailers expressed that data and its associated IT systems, business intelligence and analytics are essential for creating profits. While there are considerable disparities between the companies to which extent BI&A is used and which functions are impacted, all interviewees use BI&A for similar sources of value creation, which is reflected in their exploitative and explorative processes. A focus on becoming more data-driven in several business functions was apparent, especially in the more

prominent online retailing organizations, by having appointed teams responsible for BI&A. Several of the interviewed companies had taken recent steps to integrate BI&A into daily operations, both by the above-mentioned value-adding activities and, in a few cases, to continuously explore new opportunities.

As mentioned in the results, there is an emphasis on exploitive activities over exploratory activities where operational efficiency and increased sales are the most prominent driving motivations for using BI&A. How BI&A is used for exploitive activities is extensively illustrated and accounted for under previous sections. However, what is interesting to elaborate on is the processes used primarily for improving and exploiting the operations that seem to mediate or improve exploratory activities and how this relates to existing literature. Cross-functional interfaces and interconnectedness are the two mechanisms that mediate the explorative and exploitative processes, as described by Jansen et al. (2009). Cross-functional interfaces are defined as knowledge sharing between different units and facilitates a common frame of reference. As described by the interviewees, implementing and creating methods and tools for BI&A almost exclusively involves cross-functional work, or at least that the use of cross-functional efforts improves results. As widely illustrated by the interviewees, a major value-creating factor is creating clear KPIs in and between units, which advantageously should be aligned to common targets and used with common terminology and language. Additionally, efforts to make data, KPIs, targets, and goals clear and available with business intelligence achieve a common understanding and increase performance. The KPIs were explained to be connected to business data, improving the accuracy, and further helped to decrease the time for feedback, which lowers time for decisions. Further, these efforts improve coordination between units, for example, by marketing units to understand what capacity the logistic unit has, then guiding marketing decisions at that time. While these efforts are directed towards exploiting and improving the existing business, we argue that they can directly be translated into cross-functional interfaces and should, thereby, according to Jansen et al. (2009), facilitate both exploitative and explorative activities. One example of how these efforts relate to both exploitative and explorative activities are the KPIs, which are primarily used to track exploitive activities in daily operations and how they create improvements for the organization. However, these can also be used to assess changes for exploratory activities, as with Boozt's Media Partnerships, a new business endeavor that resulted from their exploratory activities, that have reflected both in their revenue and their KPIs. Additionally, the common alignment of targets and KPIs facilitates collaboration between units, reflecting in both exploitative and explorative activities.

Further, as Magdalena Lindh at Alibris explained, creating their common KPIs involved representatives from purchasing, sales, CEM, and marketing. These functions were also mentioned to have representatives in the self-created group that worked together with analytic processes and tools. As described and proved by Jansen et al. (2009), connectedness, or the patterns of a firm's social network in terms of density, provides the base where organizational members can share experience, knowledge and

transfer and integrate new ideas that directly affect ambidexterity. The example of setting common KPIs and aligning them to common goals and targets by using cross-functional teams could have led to the formation of the self-created analytics group. Even if this might not be the case, the cross-functional work that analytics often requires will likely increase the connectedness of team members as they work more closely together. As exemplified by Kristina Lukes at Nelly, working and creating value from data requires cross-functional work, as data from multiple sources collected at different units is often necessary. These findings might show that the increases in connectedness and cross-functional interfaces are a direct effect of working with analytics to a greater extent, as BI&A, in many cases, requires cross-functional teams and collaboration. Thereby it can be argued that an increased ability in BI&A mediates an increased ambidextrous ability through an increase in connectedness and cross-functional interfaces.

Aligning the results to Benitez et al.'s (2018) study, the results seem to support that working with BI&A allows for better business experimentation. The BI&A tools allow the actors to analyze their available data in new ways, facilitating business experimentation. This could be explained by BI&A giving organizational employees the basis to use collaborative tools to provide new ideas and improvements. Further, examples such as A/B-testing enable the retailers to try new solutions and test the effect of the change, which allows the retailers to try new opportunities and solutions and assess their benefits. As accounted for in 4.4.3, the actors who had implemented BI&A tools to a greater extent, often with an incorporated analytics team, were also the ones who explicitly stated to conduct exploratory activities continuously. Thereby it could be argued that using BI&A facilitates exploratory activities by both providing tools and methods to easier conduct and test new solutions and enabling a culture that allows for exploration. Boozt was arguably the actor who used BI&A the most extensively. They had for many years worked towards leveraging their data to create business value and were the only actor who had initiated an entirely new business area, the Boozt Media Partnership. This finding seems to align with Benitez et al.'s (2018) findings that IT capabilities, in this case, BI&A, have the most significant influence on business experimentation and less on business flexibility. This is further strengthened as many actors expressed that they experimented and had the goal of finding new creative endeavors through using BI&A but had no direct examples of significant changes or new business areas. Thereby, this could support Benitez et al.'s (2018) finding that IT facilitates business experimentation and creativity, while the business flexibility needed to change is not fully supported by BI&A. Thus, acting on opportunities and implementing change likely requires a change-accepting culture, which cannot be fully facilitated by using BI&A. However, our results cannot support Benitez et al. (2018) claim that BI&A affects business exploration to a more extensive degree than exploitation, as the interviewees illustrated that the value gained from using BI&A was to a majority in the form of exploiting existing operations by decreasing costs and increasing sales. The bigger effect BI&A has on exploitation could be a result of the retailer’s inclination towards favoring exploitation over exploration rather than the

actual effect of BI&A on these processes. Thereby, supporting or contradicting this would require measuring the effect BI&A has on firm performance in their exploratory and exploitative processes, which is outside this study's scope.

As O'Reilly and Tushman (2011) state, the core of being ambidextrous is to have the ability to both accurately sense changes and have the capacity to act on opportunities and threats. BI&A gives the retailers tools to easier sense changes, such as changing customer demands from customer data or competitors' changes in pricing, availability, and assortment. Additionally, the results seem to indicate that BI&A also facilitates finding new opportunities and threats by providing tools and methods to analyze internal and external data in more efficient and collaborative ways. Further, there seems to be a correlation between how incorporated BI&A is into the company and how inclined the firms are to perform exploratory activities and incorporate the findings by changing organizational resources and capabilities.

6
Conclusion

This chapter presents the theoretical contribution of the study divided into the two research questions, followed by an elaboration of the practical implication of our findings. Lastly, limitations and areas for future research are presented.

6.1 Theoretical implications

RQ1 - How are business intelligence and analytics creating value in the B2C online retailing industry in Sweden?

On a high level, the theory on value drivers for using BI&A is consistent with our findings, such as improving operational efficiency and increasing sales. Examples of increased operational efficiency and increasing sales with BI&A are exemplified in functions such as marketing, logistics, warehousing, and administration. Further, contributions are made to theory on a lower and detailed level by illustrating how BI&A in these functions are used to achieve lower costs by improving operational efficiency and increasing sales with various activities. E.g., cost decreases are supported by BI&A by allowing for better capacity coordination or by using attribution modeling. Further examples are displayed, such as how returns can be lowered using BI&A and were portrayed as yielding very high value as many online retailers bear large costs associated with returns. How increased sales is achieved with BI&A is exemplified with various types of analysis that leverage customer and operations data. Examples include product recommendations, listing improvement, and different types of customer data analysis. Value is created by gathering, structuring, and presenting data with BI and aligning BI measures, such as KPIs, facilitating better coordination between units that work towards targets and goals. Further, online retailers create substantial value through various BA tools and methods, such as A/B testing, which efficiently can enforce and assess changes that are meant to improve the business. Examples of A/B tests include website composition increasing average order value and customer newsletter effectiveness increasing sales. Additionally, we provide examples and descriptions of BI&A activities that increase the competitiveness of the business, such as value segmentation, add-on services to suppliers, and exploiting competitors' inability to meet the demand. While the BI&A methods and tools portrayed are not revolutionary, the depiction of how these create business value both in specific functions and cross-functionally through a holistic view of online retailers' BI&A usage, possible new areas for future research are provided.

By presenting how BI&A creates value in the online retailing market with a rich and detailed narrative, our findings support and deepens existing strategic management theory on how BI&A is used to create value and provide new insights on value-adding BI&A activities.

RQ2 - How are business intelligence and analytics supporting online retailers' exploitative and explorative activities, and whether and how it facilitates their ability to be ambidextrous?

Our findings confirm and provide insights on how BI&A provides online retailers with tools and methodologies to easier perform exploitive activities by facilitating improvements and efficiency and explorative activities by giving employees the tools to collaborate and experiment with data. Our study gives support to Benitez et al. (2018) on how BI&A strengthens a firm's exploitative and explorative activities. Further, BI&A seems to strengthen a firm's ambidextrous ability by setting common data-based KPIs, aligning targets and goals, and shortening feedback loops. The BI&A tools in themselves and the alignment of KPIs targets and goals is argued to strengthen cross-functional interfaces. Further, the level of incorporated BI&A into a firm seems to correlate with an increased connectedness, as working with BI&A often requires cross-functional work, which we argue strengthens the social bonds between employees. As cross-functional interfaces mediate, and connectedness directly affects ambidexterity, according to Jansen et al. (2009), BI&A should, with our reasoning, strengthen a firm's ambidextrous ability. Thereby, our results give insights on how BI&A strengthens ambidexterity through the mediators of cross-functional interfaces and connectedness, which can provide a foundation for further research.

Our findings add to the existing strategic management literature on BI&A and ambidexterity by depicting how BI&A supports and facilitates exploratory and exploitive activities and supports ambidexterity in the online retailing market in Sweden.

6.2 Practical implications

While there are a few examples of how BI&A improves and changes the interaction with the customer to create a competitive advantage, the focus of the online retailing companies in the study has instead been on decreasing costs and increasing sales by improving the existing operations. Several examples are presented of efforts that create substantial value, which can be used as inspiration for online retailers, such as value segmentation, which allows identification of high-valuable customers, enabling retailers to cater their offerings to the right customer at the right time. Further, BI&A enables online retailers to a larger extent to find and sell to customers that will be the most profitable, which can be viewed as a means to choose which customers to interact with more extensively. Finding the most profitable customers is enabled through

existing internal know-how of the customers' needs and product assortment connected to the data collected on both customers and competitors. While increasing sales and improving operational efficiency will improve profitability and short-term competitiveness, there could be a need for more efforts to improve the interaction with the customer through performing exploratory activities.

However, one example was found on how BI&A had facilitated the exploration process to create a new offering. Boozt created a new business area, arguably as a result of BI&A capabilities, by understanding how their data could be of interest to their supplier, which allowed them to improve its supplier relationship while creating a new revenue stream. Leveraging BI&A capabilities in this manner could be an inspiration for retailers seeking to find new business endeavors or improve and strengthen the relationship with their stakeholders.

As mentioned on several occasions, the results showed a strong inclination towards exploitive activities by online retailers, which necessarily does not have to affect long-term competitiveness negatively. As per Luger et al. (2018), the benefits gained from continuously performing exploratory and exploitative activities are highly dependent on the nature and degree of market change. As no assessments have been made on how much the online retailing market in Sweden is changing and whether it can be regarded as incremental or discontinuous change, no conclusion can be made on whether more extensive efforts should be directed into exploratory activities. However, interviewees seemed to convey a picture where the competitive climate has slowly been changing, where the most significant change is in regards to the firms, and their competition is becoming more and more data-driven. As the actors slowly have been incorporating BI&A in their business, it could arguably indicate a historical environment of incremental change in relation to BI&A, which according to Luger et al. (2018), favor a statical balance of exploratory and exploitative activities. However, we argue that the competitive landscape is likely to change shortly, as Amazon has entered the market. As Davenport and Harris (2017) state, Amazon uses analytics as a way to outperform the competition, and their entry could disrupt the industry into a discontinuous state and give the need for online retailers to adapt to this new environment quickly. As the results reinforce previous findings that BI&A tools and methodologies both strengthen the ability to exploit and explore, we argue the urgency of adapting BI&A to a larger extent while incorporating a change-accepting climate.

We hope our findings can inspire organizations seeking to improve their operational efficiency, increasing sales, and improve their competitiveness both in and outside the online retailing industry. As the study illustrates how value is created by both basic and more sophisticated BI&A tools and methods, we believe the findings can provide insights to the entire spectrum of organizations, from those just starting their BI&A endeavor to ones already far in this process. Further, our findings illustrate how the process of incorporating BI&A can help organizations become more exploratory, as BI&A provides the tools to conduct these activities, and exploratory processes are

facilitated by the cross-functional work that BI&A activities often need. Thereby we hope that our study can also inspire organizations that seek to become more exploratory to invest in BI&A capabilities.

6.3 Limitations and Future Research

In this study, various values have been highlighted that are achieved through BI&A by online retailers operating in Sweden. While the Swedish online retailing market is argued to be relatively mature to other online retailing markets and large data sets have been available for a long time, the market scope could still limit the generalizability outside Sweden. The online retailing market is one of many different industries that have access to large amounts of data. Future studies could, therefore, evaluate other industries and markets, preferably that have access to large data sets, and investigate their use of BI&A to delineate further the use and value achieved with BI&A.

The focus of this study was to describe the value appropriation of BI&A, not how tools and methods are used in detail. Further, data was collected through interviews with 1-2 representatives from each organization. A future study could focus on a particular company to capture how the process of working BI&A unfolds in greater detail. Further, this study had a descriptive nature and did not attempt to measure or grade how much value different BI&A tools and methods entailed, which limited objectivity regarding the performance gained. Future studies could, therefore, focus on either how the BI&A methods best should be used or try to measure the economic impact from different BI&A tools and methods.

Having a group within the company that focuses on both exploitation and exploration, namely contextual ambidexterity, is one way of structuring the business to find new opportunities and to make the business iteratively better, which in our selection has been done by incorporating a team within the business that works cross-functional. The other way of structuring the business to be ambidextrous is by structural ambidexterity, where instead a group separate from the business focuses on exploration. That the online retailing companies operating in Sweden have decided to structure themselves contextually raises the question if this way of structuring is optimal to achieve ambidexterity or if structural ambidexterity would be preferable.

Further, our finding on how online retailers increase profitability leverage customers' willingness to pay by exploiting competitors' lack of coverage affects the end-consumer could be an interesting area for a future study. Further investigating how BI&A should be used efficiently for exploratory actions to identify and implement new business endeavors could be an area for future research.

7
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A

Appendix

A.1 Interview guide online retailers

A sample of the questions that were asked to the interviewees together with an approximate time estimation for each part of the interview. Interviews lasted between 30 minutes to one hour.

Before the start of the interview
Explained the purpose of the study, questions around, approval of recording, allowance of publication, and anonymity.

Introduction (5-10 minutes)
What is your background?
What is the background of your company?
What products and services does your company sell?
What is your company's business model?

Business analytics, data, and exploitation (10-20 minutes)
How does your company use business analytics?
What value does business analytics create for your company?
Is business analytics used in decision-making?
How is the process of using business analytics set up to improve your current operations?
Which parts/departments are using insights from business analytics?
How are efforts organized to improve the organization with business analytics?
What business analytics tools are you using to improve the existing business?

Business analytics, data, and exploration (10-20 minutes)
How does your company use business analytics to innovate?
How does your company use business analytics for strategic initiatives?
How is business analytics used to sense the market for opportunities?
How are efforts organized to identify new opportunities?
What examples do you have on how business analytics has created change in your company?
What business analytics tools are you using to find and explore new opportunities?

The final part of the interview (5-10 minutes)
Any additional information you want to share in this area of Business analytics and innovation?
Are there any other people you would recommend us to interview with expertise in Business analytics and its value in online retailing?

A.2 Interview guide consultants

A sample of the questions that were asked during the interviews with experts in online retailing.

Before the start of the interview
Explained the purpose of the study, questions around, approval of recording, allowance of publication, and anonymity.

Introduction (5-10 minutes)
What is your background?
What is the background of your company?
How are you working with online retailing?
What services are you providing eCommerce companies?

Data collection and business analytics (10-20 minutes)
What data is generally online retailers gathering?
What types of analysis are online retailers conducting?
How are these analyses providing value?
What parts of an online retailer's organization draw benefits from applying business analytics?
What tools and technologies are generally used for business analytics?
What integrations of systems are required or often done by online retailer companies to make use of data?

About online retailers (10-20 minutes)
To what extent are online retailers in Sweden today good at using data and analytics?
Are data used and analytics used to coordinate activities, creating a basis for innovation and continuous improvement? How?

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