Digital transformation in interior design industry using human-centered design

Addressing internal limitations in the furniture, fixtures, and equipment department and enhancing satisfaction of corporate clients and interior design professionals of UAE-based interior design company

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Abstract

This research provides a comprehensive analysis of the commercial furniture sales industry, with a focus on identifying how digital technologies can be utilized to improve customer satisfaction. The study explores the various internal limitations that can impact customer satisfaction, such as communication breakdowns, lack of collaboration, and inefficient project management processes. It also identifies opportunities to mitigate these limitations using digital technologies.

One of the key findings of the study was that internal limitations such as communication breakdowns, lack of collaboration, and inefficient project management processes can significantly impact customer satisfaction. These limitations can cause confusion, misunderstandings, and delays in the supply chain process, leading to customer dissatisfaction. However, the study also found that digital technologies can be leveraged to mitigate these limitations and improve customer satisfaction by providing more tailored furniture solutions, improving communication, and streamlining the design and customization process.

The study identified several digital tools that can be used to improve customer satisfaction, such as online customization options, 3D visualization tools, and virtual reality technologies. These tools can help customers visualize furniture in their own space, customize furniture to their preferences, and reduce the need for manual brainstorming and design workshops. Additionally, the study found that digital loyalty management can be used to implement and track loyalty programs, improving customer engagement and satisfaction.

The study also highlighted the importance of effective procurement and supply chain management in ensuring a seamless flow of goods and services and improving customer satisfaction. Inconsistent supplier pricing and response times, slow confirmation times, delays in supply, logistics, and shipment, manufacturing delays, delayed payments, and inefficient follow-up procedures were all identified as challenges. By addressing these challenges, companies can ensure a seamless flow of goods and services and improve overall customer satisfaction.

Keywords: commercial furniture sales, customer satisfaction, digital technologies, communication, collaboration, procurement, supply chain management, 3D visualization, virtual reality, loyalty management, project management, customization.
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1. Introduction

1.1 Background and context of the study

Digitalization, which refers to the use of digital technologies to impact business-to-business interactions, companies, and markets, is causing changes in every aspect of business (Ritter & Pedersen, 2020; Volberda et al., 2021). It has revolutionized the way customers engage with businesses (Mccoll-Kennedy et al., 2019). The research by Lundin & Kindström (2023) showed that digitalization drives user engagement by enabling an increased level of activity and the inclusion of multiple roles, which is particularly relevant in business-to-business (B2B) settings where stimulating engagement is crucial. Additionally, increased customer activity and greater role inclusion reduce the dependence on any single individual relationship. Furthermore, as consistency and transparency across interactions increase, the specificity of individual interactions decreases, which mitigates the risk of varying experiences across different actors in the customer organization. Consistency across interactions can increase in digitalized customer journeys, as everyone in the customer firm has access to the same information.

B2B companies are increasingly adopting customer-centric strategies to compete globally, which often results in changes to their business models. For instance, Monsanto and Atlas Copco have transformed themselves into productivity partners by offering advice and support to their customers (Lundin & Kindström, 2023). However, many B2B companies across different sectors struggle to keep up with this trend. In the past, winning in the B2B arena has been about offering superior products and services or being the lowest-cost producer. But with the increasing global competition, investing in functional excellence is no longer sufficient to gain a competitive edge. This holistic transformation must encompass the company’s culture and core, enabled by digitization. However, achieving the right balance between digital and human interaction in complex customer relationships is crucial (McKinsey, 2022). B2B customers are already demanding a better experience. In a recent McKinsey survey (McKinsey, 2022) of 1,000 B2B decision makers, lack of speed in interactions with their suppliers emerged as the number-one “pain point,” mentioned twice as often as price. And digital solutions loom large in executives’ thinking to make routine tasks more efficient. Some 86 percent of respondents said they prefer using self-service tools for reordering, rather than talking to a sales representative.

Recent research on B2B networks has suggested that digital platforms can help overcome limitations of offline environments, such as paper-based or face-to-face interactions with participants (Pandey et al., 2020). Digital platforms make network orchestration easier, and as a result, B2B networks are rapidly transitioning from offline to digitalized and connected platforms (Wei et al., 2019). This shift has given rise to a new business ecosystem for customer connections and interactivities. The impact of digital communication networks can be seen as companies move from face-to-face interactions to digital business platforms that use multiple digital resources to promote business and knowledge sharing (Ford & Mouzas, 2013). In this global process of digitalization and ubiquitous connection, digital platforms have become a new and important organizational form.

If trust is established, then implementing digitalization in a collaborative B2B process can offer significant benefits. Digitalization can serve as a competitive alternative to face-to-face communication in this business context, providing an effective means to
manage relationships and share information efficiently, inexpensively, and on a large scale. The availability of information and scheduling flexibility make it easier to maintain relationships, which is similar to some offline networks. However, as networks grow and become more complex, digital architectures become increasingly important to navigate within them. Currently, organizations are transitioning from a product-centric and firm-centric perspective to a personalized and interactive user experience that requires more digital architectures (Richard & Devinney, 2005; Smith & Smith, 2021). Digital platforms are useful for building relationships and trust among people who want to collaborate (Eloranta & Turunen, 2016).

After COVID-19 pandemics, the majority of sectors that were used to conducting their business in a traditional way rapidly adopted technological advances. Business customers have largely accepted digital interactions, to the point where it is estimated that by 2025, 80% of B2B interactions will be digital (Gartner, 2023). For example, the hospitality industry switched to self check-in and check-out kiosques, mobile check-ins, direct booking applications and even digital-in diving services (Economic Times, 2023). Airport industry introduced contactless technologies, biometrics, electronic bag tags and offsite processing (Future Travel Experience, 2023).

However, despite the rapidly changing world around us, many industries continue to conduct business in traditional ways. One industry that stands out for its surprising adherence to traditional methods is commercial interior design and Furniture, Fixtures, and Equipment division of it in particular. Despite being one of the most influential industries in the world, the fit-out industry is surprisingly under-digitized in the 21st century. Up to 40% of companies in this sector have lagged behind their peers in the adoption of technology, often due to limited resources (archdesk, 2023).

The furniture, fixtures, and equipment industry plays a crucial role in the success of commercial projects such as hotels, offices, and healthcare facilities. The furniture, fixtures, and equipment refer to the movable items in these spaces, ranging from chairs and desks to artwork and lighting fixtures. Proper selection, procurement, and installation of the furniture, fixtures, and equipment is essential to create a functional, comfortable, and aesthetically pleasing environment that meets the specific needs of the project and its users (Designing Commercial Interiors, 2023; Inform Design, 2023). The furniture, fixtures, and equipment products can also include custom furniture, millwork, awnings, specialty equipment, audiovisual equipment, or custom lighting. Refinishing or reupholstering can be part of the furniture, fixtures, and equipment packages to avoid purchasing new furniture (Designing Commercial Interiors, 2023; Inform Design, 2023).

Clients who lack facility management or purchasing departments often seek help from interior designers or furniture dealers for the furniture, fixtures, and equipment selection and procurement services. Interior design and fit-out companies, as well as specialists can offer the furniture, fixtures, and equipment selection services and in some cases, the furniture, fixtures, and equipment acquisition management services to these clients (Inform Design, 2023). The process involves defining needs, developing concepts, specifying products, estimating costs, soliciting bids, and overseeing installation (Inform Design, 2023).

The furniture, fixtures, and equipment specialists can assist in assessing the quality, value, and appropriateness of existing furnishings for use in a new or upgraded facility, evaluating the costs and benefits of purchasing new furnishings versus refurbishing or
reupholstering existing ones, and working directly with manufacturers to expedite the procurement process. Clients often look for a single source to manage the furniture, fixtures, and equipment procurement process to simplify the process and reduce the number of contacts they need to make (Designing Commercial Interiors, 2023).

However, the furniture, fixtures, and equipment procurement process is often complex and challenging, requiring coordination among various stakeholders such as designers, manufacturers, vendors, and installers. It can be divided into two categories: the furniture, fixtures, and equipment selection services and the furniture, fixtures, and equipment acquisition management services (Designing Commercial Interiors, 2023).

The furniture, fixtures, and equipment selection services require specialists to evaluate the client's needs and requirements for the project, identify the furniture, fixtures, and equipment needs for all functional spaces, evaluate existing furniture that can be reused, and consider numerous factors such as the functions and types of spaces, the number of staff and visitors, storage requirements, signage, artwork, and existing furniture conditions (Designing Commercial Interiors, 2023). Specialists who offer the furniture, fixtures, and equipment selection services must have knowledge about various types of furniture products, including systems furniture, case goods, seating, and freestanding furniture, as well as an understanding of ergonomics, furniture construction, and fabric characteristics (Inform Design, 2023). They must also prepare accurate cost estimates that factor in applicable taxes, shipping and storage costs, installation costs, and fuel charges, in addition to the cost of the product itself (Designing Commercial Interiors, 2023). Specialists must also have knowledge of the furniture, fixtures, and equipment bidding procedures for both private and public projects (Inform Design, 2023).

The furniture, fixtures, and equipment acquisition management services involve several activities and tasks that an architect may provide to the client to manage the furniture acquisition process (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023). In the ordering phase, the architect reviews and approves the dealer's final bid, reviews the detailed systems furniture list, and checks invoices for accuracy before recommending payment by the client. The architect also reviews submittals to ensure the finish and fabric selections are appropriate (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023). During the tracking and scheduling phase, the architect checks acknowledgments for accuracy, records estimated delivery dates, and recommends substitutions or changes to meet the move-in schedule (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023). The architect coordinates with the furniture dealer(s) to schedule delivery and installation and provides on-site supervision during major furniture installation. In the delivery and installation coordination phase, the architect coordinates with the design team during punch list preparation, contacts manufacturers or installers to make repairs, and files and monitors freight or damage claims (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023). Finally, the architect arranges for the installation of artwork and accessories (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023). Despite the challenges of this complex process, the furniture, fixtures, and equipment specialists are better prepared to recommend appropriate solutions for a client's needs.

In the United Arab Emirates (UAE), the furniture, fixtures, and equipment market was valued at USD 7.9 billion in 2021 and is expected to grow at a compound annual growth rate of 4.2% between 2021-2026 (researchandmarkets, 2023). The hospitality and
healthcare industries are major consumers of the furniture, fixtures, and equipment products and services in the UAE. The growth of the tourism industry has led to an increase in construction of hotels and resorts, while the country is investing heavily in building new hospitals and healthcare facilities, which has led to an increase in the demand for medical equipment, furniture, and fixtures (researchandmarkets, 2023).

In conclusion, digitalization has revolutionized business-to-business interactions, and B2B companies need to adopt customer-centric strategies that combine digital and non-digital transformation to improve customer experience and gain a competitive edge. The furniture, fixtures, and equipment industry is one of the industries that have yet to adopt digital transformation fully. Despite the challenges, the industry specialists are better prepared to recommend appropriate solutions for clients' needs. The UAE has a significant market for the furniture, fixtures, and equipment products and services, with the hospitality and healthcare industries being the major consumers.

One of the companies that has faced these challenges is a leading commercial construction and fit-out services provider with Swedish roots in the UAE market that has been operating there for the last 30 years. They offer the furniture, fixtures, and equipment services to their clients in addition to fit-out and traditional projects. However, the current design project process is handled in a traditional way. The clients that the company has are referral, hence when they need a project they call the sales department, who then pass the projects to account managers. Then the whole design project from ideation to implementation is handled manually. This process has been identified as a problem by top management, who see an opportunity in the development of a digital platform that will streamline the sales process by providing customers with an easy-to-use interface that allows both them and the team members to easily collaborate on interior design projects. However, the company is hesitant about the possibility of digitizing the whole fit-out and design process now, so they chose their furniture, fixtures & equipment department for the research and pilot project.

To address this challenge and capitalize on the opportunity, the company has hired a product designer (the author of this thesis) to develop an ecommerce platform that will enable them to improve the Furniture, Fixtures, and Equipment work process and their interaction with the clients. The development of this digital platform is a timely and relevant project that addresses the challenges faced by the furniture industry in the B2B market. By integrating digital technologies into their sales process, the company aims to stay competitive and better serve their customers. The product designer's role in this project is crucial, as they will be responsible for ensuring that the platform responds to the problems and meets the needs of both the company and its customers.

1.2 Problem description

The previous sections described the operational process of the furniture, fixtures, and equipment industry. The results of these processes are the challenges that the industry is confronted with. The studies by Inform Design, 2023; Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023 highlight the following problems faced by the industry: limited resources (the furniture, fixtures, and equipment specialists may be limited in terms of resources, such as time and budget, which can impact their ability to research and recommend the best products for a project); inefficient communication
(communication between clients, designers, contractors, and vendors can be slow and inefficient, leading to delays in the acquisition process); manual processes (manual processes such as filling out paper forms and creating spreadsheets can be time-consuming and prone to errors, which can delay the process and increase costs); limited knowledge (the furniture, fixtures, and equipment specialists may not have knowledge of the latest product offerings and industry trends, which can limit the options available to clients); limited access (the furniture, fixtures, and equipment specialists may not have access to all the necessary resources, such as databases of product information and pricing, which can limit their ability to make informed decisions and provide accurate cost estimates). Additionally, the furniture, fixtures, and equipment industry is subject to various external factors such as supply chain disruptions, changing consumer preferences, and technological advancements that can further complicate the procurement process (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023). Delays, errors, and miscommunications can result in cost overruns, project delays, and user dissatisfaction (Designing Commercial Interiors, 2023).

Before COVID-19 pandemics the issues were not that evident and the furniture, fixtures, and equipment process handled by the interior design and fit-out companies worldwide were considered to be comfortable and involved specifying products from local suppliers for projects all over the world handled manually by the furniture, fixtures, and equipment specialists (archdesk, 2023). However, since the beginning of COVID-19 pandemic the industry experiences changed customer preferences, advancements in technology, and the impact of COVID-19. The ongoing supply chain issues caused a need for rethinking how the processes were carried out (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023).

Among the challenges faced by the furniture, fixtures, and equipment specialists and companies in UAE there were limited access to materials and samples from suppliers, which caused problems in preparing the mood boards for design projects that forced them to work with what was available, leading to potential issues in accurately presenting their designs to clients; material shortages and reliability issues on longer project resulted in the need to respecify and reevaluate designs, leading to additional costs and delays. In UAE some companies tried to deal with the challenges by starting to work with local manufacturers and suppliers. However, due to the large quantities of products required, the furniture, fixtures, and equipment companies faced supply chain issues and extended lead times as the local manufacturers were unable to cope with the volume, affecting the design process of large hospitality projects, compromising on the overall design and quality of materials. Despite slow improvement in the industry, smaller design studios are still facing significant strains on their resources and manpower due to the time-consuming task of re-selecting products and specifying finishes. This is particularly challenging for food and beverages projects where the procurement process and timelines are more demanding. Additionally, these studios may face limited options in the event of shipping delays or extended lead times, or if the client leaves the furniture, fixtures, and equipment until the last minute. In such cases, being involved in the post-contract side is important to continue responsibility through the construction development (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023; occa-design, 2023).

Among other issues encountered by the interior design and fit-out companies the specialists names miscommunication between clients and teams, inaccurate data leading to
delays in project handover, improper allocation of teams and contractors, difficulty tracking project costs and revenue, and delayed project timelines caused by inadequate or non-existent mapping processes development (Inform Design, 2023; sp3london, 2023; Commercial Interior Design, 2023; occa-design, 2023).

According to Grand View Research's market research report published in 2021, the global B2B furniture market size was valued at USD 519.7 billion in 2021 and was expected to reach USD 689.6 billion by 2027, with a compound annual growth rate of 3.8% during the forecast period (grandviewresearch, 2023). However, only 15% of this market is currently available online (architecturaldigest, 2023).

In the UAE, the furniture, fixtures, and equipment process still heavily relies on offline activities, despite the availability of some digital tools and platforms for product selection and procurement (Personal communication with the owner of the researched company). The future of the furniture, fixtures, and equipment procurement will require designers to be connected to a wider range of suppliers and related services. According to Alan Benjamin (Commercial Interior Design, 2023) the founder of one of the world's leading hospitality the furniture, fixtures, and equipment procurement firms, designers will need to make more informed and efficient decisions about the furniture, fixtures, and equipment procurement services for their clients. Although local sourcing may come with challenges such as higher costs, designers can offset these issues by avoiding longer lead times, shipping costs, and accessibility issues associated with international sourcing. This reliance on offline processes can result in longer lead times, higher costs, and reduced efficiency compared to fully digital processes.

Although the interior design industry in other areas has embraced digital tools and platforms, the furniture, fixtures, and equipment sector in the UAE has yet to fully adopt this shift. Therefore, there is a significant opportunity for the development of innovative digital solutions that can better meet the specific needs of businesses and designers in the sector.

1.3 The study’s main objective and research question

The furniture, fixtures, and equipment industry faces challenges like limited resources, poor communication, and manual processes. To enhance their operations and meet customer needs, businesses must address these issues. The industry is heavily reliant on offline activities, despite the availability of some digital tools and platforms for product selection and procurement. Going forward, the furniture, fixtures, and equipment procurement process will require designers to connect with a wider range of suppliers and related services. Therefore, there is a significant opportunity to develop innovative digital solutions that meet the specific needs of businesses and designers in the sector.

The aim of this research is to utilize Human-Centered Design (HCD) as a framework to identify user needs, limitations, and challenges within the furniture, fixtures, and equipment department of the interior design company in UAE that operates in the commercial industry. By adopting HCD principles, the focus is on gaining a comprehensive understanding of user preferences and behaviors. This research will contribute to the development and delivery stages of a larger project, which involves designing and implementing solutions to address the identified challenges. Through the application of HCD, the goal is to create furniture, fixtures, and equipment digital platform
that effectively meet user needs and enhance customer satisfaction. The research findings will inform the subsequent stages of the project, including the development of innovative solutions and the successful delivery of these solutions to end-users.

**The research questions:**

1. *How can the implementation of a human-centered design approach help identify and mitigate internal limitations within the furniture, fixtures, and equipment department of a UAE-based interior design company?*

2. *How can the integration of digital technologies within a human-centered design approach be effectively utilized to address internal limitations and enhance customer satisfaction within the department?*

**Delimitations for Research Questions**

The study will focus solely on the furniture, fixtures, and equipment department of a UAE-based interior design company. The research will not consider other departments or aspects of the company's operations. Additionally, the study will not investigate the broader interior design industry in the UAE or other regions.

The research will only explore the integration of digital technologies within a human-centered design approach to address internal limitations and enhance customer satisfaction within the furniture, fixtures, and equipment department. Other factors that may impact customer satisfaction, such as pricing and marketing strategies, will not be considered in the study. Moreover, the study will not examine the practical implementation of digital technologies, such as hardware and software requirements, costs, and potential challenges in integrating these technologies into the department's existing operations.

By addressing these research questions, the product designer can develop a digital platform that responds to the problems and meets the needs of both the company and its customers.

![Diagram](image.png)

**Fig. 1:** *The target audience is circled on the visualization, while stakeholder agents are put outside*
The research project and its overall scope are aimed at two primary target audience groups: the customers of the company and the business staff involved in product selection and procurement, specifically furniture specialists and interior designers (Fig. 1).

The customer group can be further divided into two subgroups: the primary customers, which include business owners seeking interior design services and new furniture for their spaces, and the secondary customers, comprising architectural agencies, interior design agencies, procurement agencies, cost-consultants, and freelance designers who are hired by business owners to assist with design and furniture procurement. The second target audience consists of specialists who provide services to the primary customer group, such as furniture purchase, interior design services, and customer interactions. These two audience groups are depicted in rounded figures in the visualization. The stakeholders involved in this research encompass vendors and suppliers providing furniture to the specialists and customers, top management responsible for final business decisions, the finance and submission team handling pricing strategies for the furniture department, the business development and commercial departments responsible for acquiring new customers, and the academic institution represented by Malardalen University.

1.4 Significance and purpose of the study

While many studies in the fields of information systems, business, and industrial marketing have emphasized the importance of understanding the causes and effects of digitalization, there is still much to explore (Smith & Smith, 2021; Wei et al., 2019; Yeow et al., 2018). Specifically, there is currently no research on the digitalization of the furniture, fixtures, and equipment sector. Previous research has focused on its impact on factors such as corporate reputation, business model innovation, information technology habits, and the effects of organizational information technology innovation in hospitals (Ali et al., 2015; Bhatti et al., 2021; Lankton et al., 2010; Leidner et al., 2010). Some researchers have noted that companies switching to digital business may encounter conflicts between their digital orientation and their internal resources (Yeow et al., 2018). However, no research has covered the furniture, fixtures, and equipment industry and the effects of digitalization.

This study employs a human-centered approach to support digitalization in the furniture, fixtures, and equipment (the furniture, fixtures, and equipment) sector. Human-centered design (HCD) has been proven effective in identifying user needs and pain points, and in designing solutions that meet those needs (Liedtka et al., 2011). According to Liedtka et al (2011), HCD can help businesses create new products and services that meet customer needs and drive growth. In the context of digital transformation, the study by Gothelf (2020) emphasizes the importance of putting people at the center of digital transformation efforts to create lasting and meaningful change.

This study is significant because it contributes to both academia and industry. Academically, it enhances our knowledge of the potential of digital technologies to transform traditional industries, such as commercial interior design and fit-out. It also contributes to the emerging field of digital transformation, providing insights into the factors that hinder or facilitate the adoption of digital technologies in the commercial interior design and fit-out industry as well as human-centered design field to support digitalization.
For industry practitioners, this study offers practical insights into the potential benefits of digital transformation, particularly for companies that offer furniture, fixtures, and equipment services. Understanding both employees and user problems and needs and working with them through digitalization enables companies to gain a competitive advantage in the market, especially as clients increasingly demand digital solutions that enhance project delivery and reduce turnaround times.

1.5 Overview of thesis structure

The thesis will begin with an introduction that provides background information on the furniture, fixtures, and equipment sector in the UAE and the importance of digitalization in the sector. The introduction will also provide the research question and objectives of the study. The second chapter will review the literature related to digitalization of B2B sector, including the challenges and the benefits of digitalization. The third chapter will describe the research methodology used in the study, including the research philosophy and strategy, data collection methods, and data analysis techniques. The fourth chapter will present the findings of the study, including the needs and problems identified in the researched company. Finally, the fifth chapter will provide a conclusion and discussion of the implications of the study, including the connections between the company’s limitations and customer satisfaction as well as potential impact of digitalization to mitigate the limitations and the future research directions in this area.

2. Literature Review

2.1 Research method

In my initial search for digital platforms and user engagement in the B2B the furniture, fixtures, and equipment and interior design industries, I was unable to find any relevant information. Therefore, I adjusted my search to focus on B2B e-commerce and digitalization. To begin, I needed to define the key concepts of emerging digital technologies. I conducted thorough research and drew upon my experience in the IT field to determine the relevant search terms, which included Electronic Commerce, Sales, Commerce, Business To Business, Digital Transformation, Digital Platforms, E-commerce, Digitalization, Business-to-business, Digital Technologies, Innovation, Information Management, B2B E-commerce, Digital Platform, Digitization, B2B Sales, E-Commerce, International Trade, Business-to-Business, Business-to-business (B2B), Digital, Digital Business. Using these search terms, I conducted two searches using the Scopus and ABI/INFORM Global databases, cross-referencing the results to ensure accuracy. The search strings were built using a combination of article title and main text body stem searches, grouped by keywords. The initial search returned 1924 articles, which were then filtered to exclude non-English articles, leaving a total of 120 peer-reviewed articles and conference papers. These articles were further refined based on their relevance to the business, management, accounting, computer science, social sciences, economics.

After reviewing the titles and abstracts of the remaining articles, only 35 academic journal articles were found to be relevant to the topic of B2B ecommerce. The same process was repeated with the ABI/INFORM Global database, which yielded a total of 10 relevant
articles. In total, 45 articles were included in the analysis and synthesis phase of the research.

2.2 The Role of Digital Platforms in Building and Maintaining Business Relationships

In today's fast-paced and ever-changing business landscape, companies are turning to digital transformation to stay competitive. This shift towards digital transformation has become increasingly popular due to its benefits. Digitization of B2B processes, for example, has emerged as a competitive alternative to face-to-face communication. This allows for swift, affordable, and scalable management of relationships and information sharing, especially when trust is present. However, while the benefits of digital transformation are clear, its implementation can be a complex and lengthy process.

Research has shown that digital platforms are an effective solution for building trust and maintaining relationships among members to collaborate. For instance, Eloranta and Turunen (2016) found that digital platforms are an effective solution for building trust, while Richard and Devinney (2005) found that they are effective in maintaining relationships among members to collaborate effectively. Thus, digital platforms play a crucial role in building and maintaining relationships.

However, achieving the full benefits of digital transformation requires more than just buying technology. Companies need to build IT-enabled resources over time to create organizational capabilities. This means that firms need to develop a measurement scale for digital capability maturity and IT-enabled resources to guide them in their digital transformation journey (Hortovanyi et al., 2023). This is particularly important as research shows the implementation of digital technologies in industrial business relationships carries both positive and negative effects for the relationship, which need further exploration, given that these changes are likely to be permanent (Khodabandeh & Lindh, 2020).

To succeed in the digital space, manufacturers need to work with their partners and customers to create advanced digital services using their industrial assets. This is important to develop more advanced and automated services, and investing in digital platforms can add more advanced features to the platform, allowing for more advanced services (Burston et al., 2020). Additionally, further research is needed to understand the capabilities of B2B networks, the role of digital leadership, and the impact of digital communication on business relationships (Dang & Vartiainen, 2019; Pagani & Pardo, 2017).

Current platform literature lacks a process perspective on how platform architecture development and governance mechanisms co-evolve in the B2B context, which requires close collaboration between platform sponsors, complementors, and customers. Actor-specific data plays a vital role in shaping platform growth and governance, highlighting the need for further understanding of the co-evolution of platform architecture and governance in the B2B context (Cennamo, 2020; Eisenmann et al., 2008; Rietveld & Schilling, 2021).

In conclusion, the story of digital transformation is one that is constantly evolving, and businesses must adapt to stay ahead of the curve. By embracing digital transformation and investing in IT-enabled resources, companies can build the organizational capabilities necessary to succeed in the Fourth Industrial Revolution. While the implementation of digital technologies can be complex, the benefits of digital transformation in building and maintaining relationships cannot be ignored.
2.3 The Benefits and Challenges of Digital Transformation in Building and Maintaining Business Relationships

In the ever-changing landscape of B2B businesses, many models that have worked in business-to-consumer (B2C) contexts do not apply (Corsaro & Anzivino, 2021; Janovick, 2017). The study by Cennamo (2019) found that in contrast to B2C, where the winner-takes-all approach prevails, B2B operates on a platform coopetition model. The high switching costs, narrow platform scope, and size encourage coopetition between platforms rather than competition (Cennamo, 2019).

In the B2B context, digital relationships have become essential as buyers increasingly search for products and services online (Steinhoff et al., 2019; Thaichon et al., 2018). However, companies are disoriented on how to maintain a relational approach while integrating human and digital technologies (Lacka & Chong, 2016). Lacka and Chong argue that new frameworks are needed to explain interactions between companies and actors in their ecosystem.

Digital transformation goes beyond simple digitalization of resources, according to Sheth (2020). It involves using digital technologies to bring significant improvements to businesses, often resulting in new or revised business models (Sheth, 2020). Digital tools generate an enormous amount of information that, if utilized correctly, can improve business decisions and operations. However, merely implementing advanced tools is not enough (Sheth, 2020). Firms need human capabilities to interpret data and convert it into useful knowledge (Sheth, 2020).

Digital instruments have revolutionized the dimensions of time and space in which business interactions take place according to Breidbach and Maglio (2016). The integration of resources in every moment and place has transformed these tools into co-creation instruments and COVID-19 has affected B2B relational approaches, creating new digital scenarios (Ordanini & Pol, 2001; Følstad & Kvale, 2018; Ramaswamy & Ozcan, 2018). Corsaro and Anzivino propose a holistic and systemic view of value creation in digital contexts to interpret and manage interactions.

B2B buyers believe that digital channels are becoming more convenient, with immediate access to product characteristics and customer reviews, which increases trust and transparency in the brand and the company itself. Several studies (Catlin et al., 2017; Pavlou & Sawy, 2010; Ray et al., 2020) found B2B customers prefer digital communication, such as do-it-yourself technology or live bot chats and texts, to traditional salesperson interactions.

Sellers can acquire new customers through the appropriate use of digital inbound marketing strategies, such as webinars, blogs, and email, which help in finding potential leads and transforming them into loyal customers (Bharadwaj & Shipley, 2020). Digital approaches also help firms become more effective in generating customer engagement and finding new business connections (Bharadwaj & Shipley, 2020).

Digitalization highly influences inter- and intra-organizational resource integration, allowing the possibility to connect with unrelated actors or organizations, and changing the ecosystem in which firms operate (Sklyar et al., 2019). Social media has become an essential tool in this process, even in B2B. Managers can use automation systems to
identify potential customers, streamline the sales process, and save time (Sklyar et al., 2019).

In B2B interactions, it is crucial to communicate requests and objectives clearly. Visualization is an effective tool for demonstrating the value of offers and opportunities in business relationships (Corsaro & Anzivino, 2021). Digital presentations and real-time dashboards are useful for enabling visualization and coordination (Corsaro & Anzivino, 2021).

Communication and coordination issues can arise in long-chain teams with a large number of employees, particularly during the pandemic (Corsaro & Anzivino, 2021). B2B firms tend to prefer smaller teams with clear leadership and specialized roles. Agile organizations use digital tools to promote direct interactions and coordinated business processes (Corsaro & Anzivino, 2021). The pandemic has accelerated the adoption of new structures and digital approaches for coordination in B2B firms (Corsaro & Anzivino, 2021).

Digital communication through video conferences and social media has also eliminated the need for travel and long negotiations (Corsaro & Anzivino, 2021). Advanced tools such as AI and IoT have enabled the processing of data without human intervention, and this has become crucial for B2B firms to survive in the digital era (Sundararajan, 2016).

In conclusion, digital transformation is critical for B2B firms that want to remain competitive and create value. Digital tools provide convenience, transparency, and accessibility to both buyers and sellers, leading to improved business relationships. However, digital transformation is not without its challenges. Firms must overcome issues such as communication and coordination, ensuring they have the necessary human capabilities to interpret data correctly and convert it into useful knowledge. They must also integrate digital tools with traditional relational approaches effectively. Finally, the transformation must go beyond simple digitalization of resources to bring significant improvements to businesses, often resulting in new or revised business models.

2.4 Challenges and Approaches for Digital Innovation in Companies

In today’s digital age, companies face various challenges in maintaining a competitive edge. One challenge is the need to react to changing market requirements, while the other is to propose new solutions proactively based on new digital technologies (Abrell et al., 2016). Companies need to adopt a proactive approach to make good use of new digital technologies. However, managing uncertainties about future market needs is the focal challenge of this approach. The article emphasizes the importance of distinguishing between customers and users and managing their knowledge differently to overcome the challenges.

To overcome the challenges, companies should seek to understand their markets and find new ways to set a long-term direction for digital innovation. Integrating user knowledge into their digital innovation processes is crucial to innovate proactively beyond incremental improvements in current products and services (Abrell et al., 2016).

In a study by Berezina et al. (2022), it is recommended to create test groups of stores and outlets to identify technical problems before introducing innovations. Moreover, the company should provide free technical equipment to retail outlets and consider creating
training materials that explain the functionality of the platform to improve the online purchase experience of customers. The study also suggests smoothing the transition of existing customers to the platform and leaving them the opportunity to interact with sales representatives through additional communication channels without the physical presence of sales representatives at the outlet.

Khan et al. (2022) presented a research paper on Sappi's B2B and B2C e-commerce sites. The study revealed that customers gave higher ratings than employees for usability, pragmatic and hedonic qualities, and net promoter score. Additionally, customers experienced more usability issues, potentially due to having more than one annotator per recording. The analysis also revealed that employees tended to compare Sappi's B2B site with B2C e-commerce sites, while customers compared it with other B2B sites. The study suggests that companies should recognize this bias, involve employees in testing and improvement, communicate the differences between B2C and B2B sites, and consider renaming the site to address the implicit comparison.

A study by Heinold et al. (2022) on WERU GmbH found that customer satisfaction and trust have a significant influence on customer loyalty. This study confirmed the strong relationship between customer satisfaction and loyalty found in previous research and also identified satisfaction as a direct influencing factor for loyalty. The study suggested involving customers in the development process of products, which could increase customer loyalty in the long run. The provision of e-learning tools and community platforms could be used to counteract B2B-customer concerns. Trust was found to be strongly influenced by open and honest communication.

Pala et al. (2019) conducted a literature review on architectural and interior design-specific e-marketplace systems and found that there is limited research on this topic, with most studies focusing on proposing or developing prototypes for the industry. Challenges to the adoption of e-Marketplace systems in the industry have been identified, such as lack of trust, technical infrastructure, workforce, behavioral issues, fragmentation, and investment in technology. However, the case study findings on a contractor organization's context highlight several unique challenges due to the inter-organizational nature of B2B e-marketplace systems and their processes. These include the diversity of business units and industry sectors, project characteristics, and purchasing characteristics, which suggest that a one-size-fits-all approach to digitizing purchasing and procurement processes may not be appropriate in large organizational contexts. To achieve effective adoption and acceptance at multiple levels, different B2B e-marketplace system configurations should be considered, with the adoption and acceptance of these systems being highly correlated with end-users' job function. Furthermore, post-implementation evaluation is crucial for optimizing the use of B2B e-marketplace systems.

In conclusion, digital innovation is crucial for companies to maintain a competitive edge in today's market. To achieve this, companies must adopt a proactive approach and integrate user knowledge into their innovation processes. Overcoming the challenges posed by digital innovation requires a deep understanding of the market and the needs of customers and users. Companies should also recognize the biases of their employees and involve them in testing and improvement processes. Furthermore, companies should consider different configurations of B2B e-marketplace systems to optimize adoption and acceptance. Post-implementation evaluation is also essential for optimizing the use of these systems and achieving effective adoption and acceptance at multiple levels.
3. Methodology

As a researcher, I am interested in investigating the internal limitations within the processes of the furniture, fixtures, and equipment department in a fit-out company in the UAE and how they affect customer satisfaction. To achieve this goal, I have decided to use human-centered design (HCD) as the basis for my investigation. HCD is a widely used process in various industries (Norman et al., 1986), including interior design and furniture, with its primary objective being to drive innovation by understanding the needs of users, developing innovative solutions to meet those needs, and delivering effective solutions within specific social and economic contexts (IDEO, 2023).

The International Standards Organization (ISO, 2010) has established key principles for human-centered design, including the incorporation of user-centered evaluation, an iterative process, consideration of the overall user experience, and the involvement of a diverse team with multidisciplinary skills and perspectives (ISO, 2010).

In the context of the interior design and furniture industry, the underlying philosophy of HCD encourages leaders and managers to design products that align with how users, including clients and beneficiaries, can, want, or need to use them (IDEO, 2023). Instead of requiring users to significantly modify their behavior or attitudes to accommodate the design and furniture, the aim is to enhance the usefulness, usability, and adoption of these products (IDEO, 2023). Ultimately, this approach aims to improve the overall interior design and furniture experience, leading to positive outcomes and impacts.

To achieve my research objectives, I plan to use grounded theory and interpretivism in my investigation. These research methodologies will allow for a deeper understanding of the subjective experiences and interpretations of individuals, providing a more complete picture of the phenomenon being studied. Grounded theory qualitative methods can be employed to inform the HCD process. By using a combination of HCD and grounded theory, I hope to gain a comprehensive understanding of user needs, preferences, and behaviors, and develop furniture, fixtures, and equipment that meet those needs effectively.

The Double Diamond model and Human-Centered Design (HCD) are two interconnected concepts that have gained significant attention in the field of design and innovation. The Double Diamond model is a visual representation of the design process, while HCD is a philosophy and approach that places users at the center of the design process.

The Double Diamond model, introduced by the Design Council UK, presents a systematic approach to design thinking, emphasizing the importance of divergent and convergent thinking in the design process. The model consists of four distinct stages: Discover, Define, Develop, and Deliver (Design Council UK, 2005). In the Discover stage, designers immerse themselves in the problem space, exploring and gathering insights to understand the users, their needs, and the context of the design challenge. The Define stage involves synthesizing the gathered information to define the problem statement and establish clear design goals. In the Develop stage, designers generate and explore a wide range of possible solutions, encouraging divergent thinking. Finally, in the Deliver stage, the focus shifts towards convergent thinking, where designers refine and implement the chosen solution.

The thesis specifically focused on the first two stages of the Double Diamond process, which are the Discover and Define stages (Fig. 2). During the research, I conducted interviews with various industry stakeholders and collected data from different
sources to gain insights into the challenges and issues facing the commercial furniture sales industry. By analyzing the data, I was able to identify key issues related to communication, resource allocation, process efficiency, technology utilization, knowledge and expertise, customer service, timeliness and responsiveness, data management, stakeholder collaboration, procurement and supply chain management, and post-purchase support.

The data collected during the Discover and Define stages provided the foundation for the development of a digital platform that will address the identified challenges and improve customer satisfaction in the industry. The next stages of the Double Diamond process, which are the Develop and Deliver stages, will involve using the findings from the thesis to design and implement the digital platform.

The Develop stage will focus on creating potential solutions to the challenges identified during the earlier stages, and testing them to determine their feasibility and effectiveness. This stage will involve brainstorming and prototyping different solutions to the identified challenges, and selecting the most promising ones for further development.

The Deliver stage will focus on implementing the selected solutions and delivering the digital platform to the end-users. This stage will involve designing and developing the digital platform, testing it for functionality and usability, and finally launching it to the market.

![The visualisation of the overall digital project](image)

**Fig. 2:** *Blue color of double diamond demonstrates the part that thesis research is focused on*

3.1 Research Philosophy
Interpretivism is the research philosophy that underpins this study. It emphasizes understanding social phenomena through the subjective experiences and interpretations of individuals (Strauss & Corbin, 1990). Social reality is not objective or independent of human observation, but rather is constructed through the meanings and interpretations that individuals ascribe to their experiences (Denzin & Lincoln, 2011). Qualitative research methods are often associated with interpretivism, as they seek to explore the complexity and richness of social phenomena in-depth, rather than reducing them to quantitative measures (Creswell, 2013). In interpretive research, the researcher's role is to engage in a dialogue with participants, seeking to understand their perspectives and experiences, rather than imposing preconceived categories or theories onto the data (Denzin & Lincoln, 2011).

3.2 Research design

Qualitative research methods are particularly useful for exploring complex and emergent phenomena in-depth, and for obtaining rich and detailed data that cannot be obtained through more conventional research methods. They encompass a variety of approaches for collecting, analyzing, and interpreting data. Qualitative research methods allow researchers to explore subjective experiences and perspectives of individuals, as well as the social and cultural context in which these experiences and perspectives are situated (Creswell, 2014).

Interviews and observation will be used as the primary methods of data collection in this study. Interviews can be structured, semi-structured, or unstructured (Merriam and Tisdell, 2015). Structured interviews involve using a predetermined set of questions and are often used for survey research. Unstructured interviews are more free-flowing and conversational, allowing the interviewer to explore topics in greater depth. Merriam and Tisdell (2010) suggest that semi-structured interviews are useful for gathering rich and detailed data, as they allow for flexibility in questioning and follow-up. The interviewer can probe for more information based on the responses of the interviewee, which can lead to deeper insights and understanding of the topic being studied. Semi-structured interviews also allow for the exploration of multiple perspectives and experiences, which can provide a more comprehensive view of the phenomenon being studied. Merriam and Tisdell (2015) describe interviews as a way of collecting data through conversation between the researcher and the participant. Interviews can be conducted face-to-face, by phone, or online. Fisher (2007) suggests that interviews can be used to explore what people think or feel, what they do, or how they experience a particular phenomenon. The choice of interview type and format depends on the research question, the population being studied, and the available resources.

In-depth interviews are particularly useful for exploring subjective experiences and perspectives of individuals. Semi-structured interviews will be used, which provide a set of open-ended questions, but also allow the interviewer to ask follow-up questions based on the responses of the interviewee. This type of interview is particularly useful because it allows for exploration of the views and experiences of the interviewees in more depth (Gillham, 2000). I will be using semi-structured interviews as one of the primary methods for data collection in my research because they provide an opportunity to gather in-depth and nuanced information about the experiences and perspectives of my participants. By
allowing for flexibility in questioning and follow-up, I hope to gain a deeper understanding of the phenomenon being studied and to explore multiple perspectives and experiences.

These interviews will then be followed by observation of the furniture, fixtures, and equipment process to support the information learned through the interviews. The observation helps to provide a deeper understanding of the context and to identify any factors that might not be evident through interviews alone.

The purpose of the data collection process is exploratory, to answer 6WH questions - who, what, when, where, why, and how - to identify the participants, stakeholders, and actors involved in the furniture, fixtures, and equipment process, the current process, when and where it occurs, why digitalization is impacting it, and how it is being impacted and to find out how digitalization can impact the current furniture, fixtures, and equipment process (Lewrick et al., 2018).

The research strategy that will be used in this master thesis is grounded theory, which is an inductive research approach that aims to develop theory from the data collected. This approach enables the researcher to develop new insights and understandings that may emerge from the data (Alvesson & Sköldberg, 2009).

Grounded theory involves the development of a theoretical framework that accounts for the phenomenon being studied (Strauss & Corbin, 1990, Alvesson & Sköldberg, 2009). The framework is based on the experiences and perspectives of the individuals involved and is grounded in the data collected during the study. Grounded theory is particularly useful for addressing questions about process and building theory, usually substantive theory rather than formal or "grand" (Strauss & Corbin, 1990, Alvesson & Sköldberg, 2009). The approach allows for a flexible and open-minded approach to exploring the data and developing new insights and understandings, which is important for investigating a new field without a theoretical (Strauss & Corbin, 1990, Alvesson & Sköldberg, 2009). It is a methodology that focuses on the discovery of theory, on grounded theory, and on qualitative research (Strauss & Corbin, 1990, Alvesson & Sköldberg, 2009).

To build a substantive theory using grounded theory, the data collected is used to develop concepts and categories, which are then used to build (Strauss & Corbin, 1990, Alvesson & Sköldberg, 2009). Categories are important analytic ideas that emerge from data and answer the question "What is going on here?" (Strauss & Corbin, 1990, Alvesson & Sköldberg, 2009). The overall object of the analysis is to identify patterns in the data. Building a substantive theory involves the identification of a core category, which is the main conceptual element of theory (Charmaz, 2014). This approach allows theory to emerge from the data, rather than beginning with a preconceived theory in mind. Different types of coding in grounded theory include open coding, axial coding, and selective coding (Walsh, O'Brien, & van Teijlingen, 2015). Grounded theory studies can be found in nearly all disciplines and fields of practice (Charmaz, 2014).

To ensure relevance to the research questions and the emerging theory, theoretical sampling will be used to select participants based on their relevance to the research question and the emerging theory. Theoretical sampling will enable the development of theoretical framework in an iterative and emergent manner, allowing for refinement of theory as new data emerge (Fisher, 2007). The primary methods of data collection will be interviews and observation. Semi-structured interviews will be used to gather in-depth and nuanced information about the experiences and perspectives of the participants. Participant observation will allow the researcher to gain a deeper understanding of the phenomenon.
being studied by experiencing it firsthand. The data collected will be analyzed using open coding to identify patterns and concepts in the data, axial coding to make connections between categories, and selective coding to identify a "core" category and relate it systematically to other categories. In vivo coding will also be used as an important source of category names. Diagramming and macroanalysis will be used to visualize the relationships between concepts and categories, and to identify patterns and connections in the data collected. By using these methods, it is hoped that the research will provide rich and detailed insights into the digitalisation of processes in the furniture, fixtures, and equipment department of the fit-out company in UAE.

3.3 Methods

3.3.1 Participants and recruitment

To gather data, I employed a purposive sampling technique, which is a non-probability sampling method based on selecting subjects according to the researcher's knowledge of the population and the purpose of the study. Firstly, I used theoretical sampling to select participants who are employees of the furniture, fixtures, and equipment department, interior designers, and clients of the company (Merriam & Tisdell, 2015). Secondly, I used purposive sampling to select all actors from the value chain who were involved in the furniture, fixtures, and equipment process, both internally and externally to gain a holistic understanding of how the process works (Strauss & Corbin, 1990). For the interviews, a total of twelve participants were selected based on their roles, areas of expertise, and years of practice in the furniture, fixtures, and equipment or commercial interior design. The sample included interior designers, account managers, estimators, procurement specialists, a 3D designer, and an architect with experience ranging from 3 to 19 years. For the observation methods, a purposive sampling strategy was used to select participants who were currently involved in the furniture, fixtures, and equipment projects at the company as well as working with the company as the client (Strauss & Corbin, 1990).

The interviews with the participants were conducted in person in the showroom of the researched company located in Dubai, UAE. The interview questions were designed to gather information on the furniture, fixtures, and equipment work process, the challenges faced by industry professionals, and the potential benefits of a digital platform to streamline the process. The participants were employees of the researched company who were contacted by me to gauge their interest in participating in the study (Table 1). The interior designers are responsible for designing the layout for design projects, selecting appropriate furniture, fixtures, and equipment to meet the client's needs and specifications. The procurement specialists source and purchase the furniture, fixtures, and equipment components of the projects, negotiate prices and contracts with suppliers, and manage the delivery and installation of the items. The estimators develop cost estimates for the furniture, fixtures, and equipment materials, coordinate with vendors, and ensure that projects are completed on time and within budget. The account managers act as the primary point of contact for clients, manage client relationships, handle project inquiries, and ensure that projects are delivered on time and within budget. The sales manager is responsible for identifying new business opportunities, maintaining relationships with existing clients, and achieving sales targets. When selecting participants, I aimed at interviewing those who had
the closest relations with the clients of the company as well as direct interaction with furniture business process.

The observation helped to identify pain points in their current process and areas where digital tools could be integrated to improve efficiency and collaboration. Finally, I spent several hours observing the clients who came to the company’s showroom for the initial furniture selection process and kick-off meetings. The participants were selected based on their level of expertise in the furniture, fixtures, and equipment and their involvement in ongoing projects.

The research adhered to ethical standards by ensuring transparency and honesty with interviewees regarding the study's topic and their involvement. At the beginning of the interviews and observation, I explained that their personal data would be processed in my study project regarding digitalization of the commercial and fit-out industry within the framework of my degree project at Mälardalen University. The purpose of the study, the voluntary nature of participation, and the assurance of confidentiality were clearly explained. As I was doing interviews and observation, I needed to record the interview so that I have a complete record of both what is said and the tone and way it is said. Hence, the permission to record was needed and in case the interviewee feels uncomfortable, I informed then that I will stop the recording. Prior to the interviews, participants were requested for their consent and provided with an opportunity to ask question. A consent form was shared after the interviews were completed (Appendix 2).

Anonymity (through the use of identifiers) and confidentiality (assuring data cannot be traced back to individuals) were prioritized to gather reliable data and uphold research ethics. Compliance with the European General Data Protection Regulation was upheld, guaranteeing data security and limited access to authorized personnel only.

Table 1: Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Job title</th>
<th>Years of practice</th>
<th>Expertise</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Interior designer</td>
<td>6</td>
<td>Commercial interior design</td>
<td>01:10:33</td>
</tr>
<tr>
<td>E2</td>
<td>Account manager</td>
<td>12</td>
<td>the furniture, fixtures, and equipment</td>
<td>00:38:35</td>
</tr>
<tr>
<td>E3</td>
<td>Account manager</td>
<td>9</td>
<td>the furniture, fixtures, and equipment</td>
<td>00:56:42</td>
</tr>
<tr>
<td>E4</td>
<td>Estimator</td>
<td>4</td>
<td>the furniture, fixtures, and equipment</td>
<td>00:58:26</td>
</tr>
<tr>
<td>E5</td>
<td>Estimator</td>
<td>3</td>
<td>the furniture, fixtures, and equipment</td>
<td>01:03:41</td>
</tr>
<tr>
<td>E6</td>
<td>Estimator</td>
<td>5</td>
<td>the furniture, fixtures, and equipment</td>
<td>00:27:04</td>
</tr>
<tr>
<td>E7</td>
<td>Procurement specialist</td>
<td>18</td>
<td>the furniture, fixtures, and equipment</td>
<td>00:55:11</td>
</tr>
<tr>
<td>E8</td>
<td>Procurement specialist</td>
<td>7</td>
<td>the furniture, fixtures, and equipment</td>
<td>00:19:26</td>
</tr>
<tr>
<td>E9</td>
<td>Sales manager</td>
<td>10</td>
<td>Commercial interior design</td>
<td>00:48:00</td>
</tr>
</tbody>
</table>
3.3.2 Primary Data Collection

I collected primary data through interviews and observation. Grounded theory, which involves inductive reasoning to develop theory from data collected, guided the use of these methods (Charmaz, 2006).

3.3.2.1 Semi-structured interviews

The primary data for this research was collected through semi-structured interviews with employees of a furniture company involved in the furniture, fixtures, and equipment. Semi-structured interviews were used to collect data, allowing for open-ended questions and follow-up questions based on the interviewee's responses (Gillham, 2000). This type of interview is particularly useful for exploring the views and experiences of the interviewees in more depth (Gillham, 2000).

Interview questions should be formulated in a manner that is easily understood and inspiring to the respondents. Rich communication channels are preferred when conducting interviews, including face-to-face personal communication or using electronic communication, such as Skype (Strauss & Corbin, 1990). During the interview, the order of the questions should be flexible, allowing the interviewee to choose the order that best fits their previous answers (Strauss & Corbin, 1990). It is important to note that communication through the internet or channels can affect the interpretation of the answers due to the inability to see body language the same way one would do in person (Strauss & Corbin, 1990).

As part of my primary data selection process, I conducted one-on-one face-to-face on-site interviews with individuals who had experience in the field related to my research question. I followed the framework for interview construction outlined by Merriam and Tisdell (2016) as well as by Maurya (2012) to ensure that the interviews were structured, focused, and provided rich data.

Before conducting the interviews, I carefully planned the interview process by defining my research question, identifying potential participants, and selecting a suitable interview format. Based on my research question, I developed a set of open-ended questions that covered different aspects of the topic (Appendix 1). Considering I had representative of different expertise domain, the interview scripts were altered based on their areas of interest. For example, with account managers who have the closest relationships with the clients, I focused on their interactions with the latter, while the with the estimators I focused more on the process of creating pricing lists for the former as they did not have direct
contacts with the client. Different scripts allowed me to encompass the furniture sales process holistically and look at the research systematically.

The questions in the questionnaires were designed to elicit information about the interviewee's experience, knowledge, and perspectives on the digitalization of processes in the furniture, fixtures, and equipment department. In addition to that I needed to capture the internal problems that occur during their work, hence during the interview I made notes that then were used to reformulate questions for the future interviews as well create a checklist for observation process to align the insights from the interviews with observation results.

I used different types of questions to stimulate responses from interviewees. According to Patton (2015), there are six types of questions that can be used: experience and behavior questions, opinion and values questions, feeling questions, knowledge questions, sensory questions, and background/demographic questions. I used it as the basis for the scripts.

During the interview, I started with warm-up/general questions such as "Can you tell me a little bit about yourself, what do you do for a living?" which is an example of an experience and behavior question. For the main questions, I used open-ended questions that allowed for a variety of responses. These questions were experience or behavior questions or opinion and values questions, depending on the specific question. For instance, I asked "Tell me about a typical day at work; what are you likely to do first thing in the morning?" to get a better understanding of the interviewee's experience.

To elicit specific information, I asked knowledge questions such as "How do you find potential clients?" and sensory questions such as "What are all the things you need to do and know in order to lead the client/project?"

To get a better understanding of the interviewee's feelings, I used feeling questions such as "How do you feel about working with clients/your job?" This type of question allowed me to tap into the affective dimension of human life and get adjective responses such as anxious, happy, afraid, intimidated, confident, and so on.

I included background/demographic questions related to the interviewee's job title or role within the company. These questions helped me to understand the interviewee's background and expertise. I also included devil's advocate questions to explore different perspectives and previous experience questions to gain deeper insights into the interviewee's background and expertise. One of the questions I asked that elicited the most interesting answers was the ideal position question: "If you had a magic want, what would you change in your work process?". The respondents suddenly would start to describe the reality of internal problems existing within the company.

According to Maurya (2012), it is recommended to debrief at the end of each week to review that week's batch of interviews, summarize learnings, and make any necessary adjustments to the script. The goal is to gradually adjust the script and customer demographic to get stronger and more consistent positive signals with each subsequent batch of interviews. My goal was to conduct from 3 to 4 interviews per week and at the end of each week I adjusted the questions of my script with accordance to the answers of previous participants and problems defined. For example, during the first set of interviews I found that most of the participants stressed out the communication problem as the most important for them. Hence, during the next round of interviews I pivoted my questions by going through each problem in turn. I also asked follow-up questions, but didn’t lead them
or try to convince them of the merits of a problem (Maurya, 2012). All these allowed me to keep track of the problems and gain a more nuanced understanding of the topic. By following this approach, I was able to ensure that the interviews were structured, focused, and provided valuable data to answer my research question.

During the interviews, I established rapport with the interviewees by creating a comfortable and safe environment for sharing their experiences and perspectives. I actively listened to their responses and asked follow-up questions to gain a deeper understanding of their perspectives. I also adjusted my approach as needed to ensure that the interviewee's voice was heard and that I was able to gather rich data.

After each interview, I transcribed the data collected and analyzed it iteratively, following Merriam and Tisdell's (2016) framework. I recorded all interviews using my phone with the participants' permission.

To transcribe the interviews, Notta AI (Notta AI, Chuo, Hokkaido, Japan), an automated transcription tool, was utilized. The selection of this software was based on its ability to provide accurate and efficient transcription services. It is important to note that when using automated transcription tools, the data is uploaded to the software platform. Therefore, strict precautions were taken to ensure the security and confidentiality of the data during the transcription process. The transcripts generated by Notta AI were carefully reviewed and cross-checked for accuracy to maintain data integrity.

The European Code of Conduct for Research Integrity provides a solid foundation for this thesis, emphasizing the importance of conducting research with transparency, honesty, and respect for participants' rights.

As a researcher, I clearly communicated that as I am the sole student conducting the project, only I would have access to the data. I ensured that research participants were fully informed about their rights regarding personal data under the General Data Protection Regulation (GDPR). I explained that their personal data would be processed in my study project regarding digitalisation of the commercial and fit-out industry within the framework of my degree project at Mälardalen University. I explained that I required their data to conduct the study project and present the findings in my degree project. I provided them with information on how to exercise their rights and address any concerns by contacting the University's Data Protection Officer at dso@mdu.se. I also informed them that their data is stored on a local folder on a computer, and no transfer of the data takes place outside the EU. To ensure transparency, I informed participants about the retention period for their personal data which equals to the length of thesis project. I also explained them that they have the right to access the data I process about them including transcripts and to request rectification or deletion of their personal data. I informed participants about their right to withdraw consent at any time and explained the practical steps to do so. Participants were also informed of their right to lodge a complaint about the use of their personal data. They were given the option to lodge a complaint either with Mälardalen University's Data Protection Officer or directly with The Swedish Authority for Privacy Protection (IMY), which serves as the supervisory authority. Contact details for the Data Protection Officer and IMY were provided for participants' convenience.

3.3.2.2 Observations

Observation is another useful method of data collection in qualitative research. Merriam and Tisdell (2010) suggest that observational data can be collected through a
variety of methods, including direct observation, participant observation, and unobtrusive measures. Direct observation involves observing people or events as they occur, without attempting to interact with them. Participant observation involves immersing oneself in the situation being studied, and observing and participating in the activities of the group being studied. Unobtrusive measures involve collecting data without the knowledge or participation of the people being studied, such as through the analysis of documents or other artifacts. Direct observation was chosen as a method of data collection for its ability to capture real-time behaviors and events without interference. It provides an objective perspective and allows for the collection of authentic and unbiased data on the work routines and interactions of the furniture, fixtures, and equipment specialists. By observing work processes and client meetings, valuable insights into the internal limitations affecting customer satisfaction can be obtained. Direct observation complements other data collection methods, such as interviews, and enables a comprehensive understanding of the research topic.

Before conducting the observations, I undertook thorough preparation to ensure a comprehensive understanding of the company's structure, internal processes, and existing technologies. By studying the company's structure, including its organizational hierarchy and departmental relationships, I gained insights into the various roles and responsibilities within the commercial furniture sales process. This understanding helped establish the context for observing the furniture, fixtures, and equipment specialists in the department and their interactions with other departments. Additionally, a deep dive into the internal processes of the company was conducted. This involved examining the workflows, procedures, and protocols related to commercial furniture sales, including activities such as client onboarding, project management, procurement, and customer support. Understanding these processes allowed me to identify potential bottlenecks, inefficiencies, or limitations that could impact customer satisfaction.

Based on the insights gained from interviews, I developed a checklist of potential internal limitations (Appendix 3). This checklist served as a guide during the observation process, ensuring comprehensive data collection and enabling me to systematically capture instances of limitations or challenges faced by the employees and the clients in the furniture, fixtures, and equipment department. By aligning the observations with the checklist, I was able to identify specific instances where internal limitations impacted the employees' ability to effectively serve clients and deliver satisfactory outcomes. This approach facilitated a structured and focused observation process, allowing for a deeper understanding of the factors influencing customer satisfaction in commercial furniture sales.

After the interviews were conducted, I agreed with an account manager and internal designer to observe their daily work routine for one working day that included observing their daily tasks as well as shadowing them during several online meetings with the clients followed by shadowing them onsite workshops with the two clients set up at different days. The reason for choosing these two specialists was linked to their close interaction with the client which is aligned with my research question as other specialists do not interact with the end-client on the daily basis.

During shadowing, I took pictures as well as thorough notes. The detailed observations included the tasks they performed, challenges they faced, and their interactions with colleagues and clients. This gave me valuable insights into the internal limitations that
impact customer satisfaction. By actively participating in client meetings alongside the specialist, I was able to observe how internal limitations manifest during these interactions and impact customer satisfaction. During these meetings, I paid special attention to clients' concerns, feedback, and problems expressed. I employed active listening techniques to attentively capture clients' problems, concerns, and feedback. I took detailed notes regarding their experiences, preferences, and suggestions for improvement, which provided valuable insights into the customer perspective.

3.3.3 Data Analysis

In the research methodology employed for this study, data collection and analysis were conducted in parallel. As data accumulated, I transcribed and read the collected data. The data analysis process for this study involved utilizing grounded theory and employing various coding techniques, including open coding, axial coding, and selective coding (Walsh, O'Brien, & van Teijlingen, 2015) as depicted in Figure 3.

![Data analysis procedure of grounded theory method](image)

Open coding was initially performed by asking questions about the data, developing categories to capture the information, and comparing them to other parts of the data for consistency. Axial coding involved reassembling the data by making connections between categories, while selective coding focused on identifying a core category and systematically relating it to other categories. In vivo coding was also utilized to derive category names (Glaser and Strauss, 1967; Strauss, 1987). The coding process required both critical and creative thinking, being open to multiple possibilities, exploring different options, and trusting the process.

The analysis began by establishing the research purpose, which aimed to examine the impact of internal limitations within a company on customer satisfaction in commercial furniture sales and explore the potential of digital technologies to alleviate these limitations and enhance overall customer satisfaction. The data collected through interviews and observations was then systematically coded, focusing on identifying patterns and insights.
that directly related to the research question and were guided by the underlying theoretical framework.

Categories were developed to be mutually exclusive, sensitizing, and conceptually congruent. Data segments were clustered into categories, and a holistic review of the data was conducted to identify emerging themes and insights. Consistency checks were performed to ensure that individual data bits aligned with the main themes.

The data analysis process involved the utilization of the Atlas.ti tool (ATLAS.ti Scientific Software Development GmbH tool, Berlin, Germany) for decoding and analyzing both the interview transcripts and the results obtained from the observations. The Atlas tool offered a range of functionalities that facilitated a systematic and comprehensive analysis of the qualitative data. In consideration of data privacy and security, the Atlas tool for qualitative analysis was selected as the software for data processing. This tool was chosen because it adheres to industry-standard security practices and provides features for pseudonymization, coding, and data encryption. It was ensured that the software was compatible with GDPR regulations and compliant with ethical guidelines for handling personal data.

To begin with, the interview data and observation results were transcribed using Notta AI, an automated transcription tool. However, it is important to note that automated transcription tools may introduce errors or inaccuracies. Therefore, a rigorous approach was followed to ensure the accuracy of the transcriptions. This involved a thorough review process where the transcribed interviews were carefully read through while simultaneously listening to the audio recordings. This step allowed for the identification and addition of any missing text or clarification where needed, ensuring the fidelity of the transcriptions.

Once the transcriptions were prepared, the data analysis proceeded with the application of a systematic coding approach using the Atlas.ti (ATLAS.ti Scientific Software Development GmbH tool, Berlin, Germany). The initial coding phase involved identifying relevant themes, concepts, and patterns in the data and assigning descriptive codes to segments of the text that captured the key ideas and concepts expressed by the participants.

Following the initial coding, an axial coding process was undertaken using the Atlas tool. This involved analyzing the relationships and connections between the codes and organizing them into broader themes and categories. The axial coding process helped uncover the underlying patterns and relationships within the data, contributing to a more comprehensive understanding of the research topic. Comparisons were made between interview data and observations.

Lastly, selective coding was performed to refine and consolidate the identified themes. This involved selecting the most relevant and significant codes and further exploring their relationships and connections. Finally, core themes and relationships were developed into a theory that explained connection between the internal limitations within a company and customer satisfaction in commercial furniture sales.

Atlas.ti tool provided a flexible platform for manipulating and reorganizing codes and categories, facilitating the development of a cohesive and comprehensive interpretation of the data.

During the data analysis process, specific problems were identified and marked with an "E" or "C" to indicate whether they were applicable to employees or clients respectively or both. These marked problems encompassed various aspects such as
estimation and budgeting, design and customization, collaboration and communication, procurement and supply chain management, and customer satisfaction and post-purchase support.

By marking the problems according to their relevance to employees or clients, a clear distinction was made to better understand the specific challenges faced by each group. This approach facilitated a targeted analysis of the factors impacting internal operations and customer experiences separately.

The analysis of the marked problems provided valuable insights into the unique perspectives and concerns of both employees and clients. It allowed for a comprehensive examination of the issues affecting different stakeholders within the commercial furniture sales industry.

By considering the marked problems in relation to the internal limitations within the company, a more nuanced understanding of the interplay between these factors was achieved. This comprehensive analysis helped to identify areas where improvements and interventions were needed to address the challenges faced by both employees and clients.

Throughout the data analysis, the constant comparative method was employed to ensure consistency and coherence in the coding process. This involved comparing and contrasting the codes and categories, looking for similarities and differences, and refining the coding structure.

The results of the coding process were organized and presented in the form of a table, as published in the "Empirical Findings and Results" section. This structured presentation allowed for a clear and concise representation of the findings derived from the data analysis process.

3.3.4 Research quality, trustworthiness, and ethics

When conducting research, it is important to ensure that the study is perceived as reliable and trustworthy. This can be achieved by adhering to certain principles that contribute to research quality. A systematic, rigorous, and clearly defined approach should be employed in terms of the research method, methodology, data collection, and data analysis (Collis & Hussey, 2014). Additionally, to account for research quality, Lincoln and Guba (1985) proposed four criteria: Credibility, Transferability, Dependability, and Confirmability. These criteria have been carefully considered and incorporated into the present research, and their detailed explanation will be provided in the subsequent sections.

3.3.4.1 Credibility

Credibility in research refers to the extent to which the experiences of participants can be accurately interpreted and recognized. Ensuring credibility involves accurately describing the research topic and actively engaging in the research process (Thomas & Magilvy, 2011). To enhance credibility, triangulation of sources and data collection is recommended (Collis & Hussey, 2014), and a thorough examination of individual participants' transcripts for similarities is conducted. To ensure the credibility of this research, several steps were taken throughout the study. Firstly, the research topic was clearly and accurately articulated to the participants, ensuring that they had a comprehensive understanding of the purpose and scope of the research. Active involvement and presence were maintained throughout the research process. As the
researcher, I was actively engaged in the data collection and analysis, closely observing and documenting the phenomena of interest through direct observation and conducting interviews. This active involvement allowed for a deeper understanding of the participants' experiences and ensured the collection of rich and relevant data. A thorough literature review was conducted to establish a strong theoretical foundation and inform the research design. This process helped to ensure that the research was grounded in existing knowledge and provided a basis for interpreting and analyzing the empirical data. To transcribe the interviews, Notta AI, an automated transcription tool, was initially used. However, to ensure accuracy and completeness, the transcriptions were carefully reviewed and edited manually. This meticulous process involved reading through the transcriptions while simultaneously listening to the audio recordings, allowing for the identification and correction of any errors or missing text. This attention to detail contributed to the credibility of the data. In the presentation of the empirical results, direct quotes and words from the participants were included. These direct quotes served as tangible evidence of the participants' perspectives and experiences, adding authenticity and credibility to the findings.

3.3.4.2 Transferability

Transferability refers to the ability to apply the findings of a study to other contexts or situations within the same subject area, without aiming for broad generalizations (Collis & Hussey, 2014). Given that this study is qualitative in nature and involves a relatively small sample size, the primary focus was on transferring the results rather than generalizing them (Shenton, 2004). While generalizability may be limited, other measures were prioritized to enhance transferability.

As a product designer and manager, my professional background may influence how I interpret the results of this study. However, to ensure transferability, this research provided a comprehensive and detailed description of the research question, methodology, sampling process, findings, and results. Furthermore, the study explicitly outlined the geographic and demographic boundaries and provided clear documentation of the data collection process. These efforts were made to enhance the transferability of the study's findings to similar contexts or situations.

3.3.4.3 Dependability

Dependability refers to the ability of one researcher to follow and replicate the research process conducted by another researcher (Thomas & Magilvy, 2011). It is closely tied to the accuracy and thorough documentation of the research process (Collis & Hussey, 2014). To ensure strong dependability, several strategies can be employed, such as involving peer participants, providing detailed method descriptions (Thomas & Magilvy, 2011), utilizing coding and audio recordings, and employing triangulation (Collis & Hussey, 2014).

This research will be peer-reviewed. In addition to that, as the interviews and observation were audio-recorded, as well as notes and photographs were taken and tools such as Atlas.ti was used for coding process, this gives a detailed description of the research process increasing the dependability of the study.
3.3.4.4 Confirmability

Confirmability refers to the extent to which the research process is clearly described and allows for the assessment of how the findings are derived from the data (Collis & Hussey, 2014). Enhancing confirmability involves adopting a "follow" rather than a "lead" approach during interviews, seeking clarifications, and diligently documenting all emotions, biases, and insights through recordings (Thomas & Magilvy, 2011). This fosters reader trust and improves the overall quality of the study.

In this research, confirmability was ensured through various measures. Open-ended interview questions were utilized, and the interviews were audio-recorded and supplemented with detailed notes. A rigorous coding process was followed. The documentation was reviewed and analyzed multiple times, thereby establishing confirmability and instilling trust in the research and its empirical data. Furthermore, the use of direct quotes and keywords from the interviews facilitated the seamless connection between the findings and the empirical data, further increasing confirmability.

3.3.4.5 Ethics

In conducting research, ethical considerations should always be considered. One important issue is informed consent, which must be obtained from all study participants. To ensure that participants are not pressured into participating or altering their behavior, it is important for the researcher to make it clear that there will be no adverse consequences for non-participation. To further ensure participant privacy, pseudonyms or participant codes should be used in place of real names during data analysis and reporting. Any identifying information that could potentially reveal participants' identities should either be omitted or anonymized.

Another important ethical issue is the privilege exploitation that can occur when a researcher is also a colleague of the study participants. To avoid this problem, peer debriefing can be used to ensure that the researcher is not rationalizing feedback into unimportance. Additionally, participants should be given the opportunity to provide feedback on their interviews to ensure that the researcher's conclusions are fair and objective.

Throughout the research process, confidentiality and anonymity must be maintained to protect participants' personal information. Informed consent must be obtained before conducting interviews or observations, and the purpose of the study, voluntary nature of participation, and confidentiality must be clearly explained. Data must be stored securely, with access limited to authorized researchers involved in the study. Any physical copies of data, such as interview transcripts or field notes, must be stored in locked cabinets. The choice of software for data processing is also important, and it should adhere to industry-standard security practices, provide features for pseudonymization, coding, and data encryption, and be compatible with GDPR regulations and ethical guidelines for handling personal data.

For the transcription of interviews, Notta Ai, an automated transcription tool, was used. The selection of this software was based on its ability to provide accurate and efficient transcription services. It is important to note that when using automated transcription tools, the data is uploaded to the software platform. Therefore, strict precautions were taken to ensure the security and confidentiality of the data during the transcription process. The
transcripts generated by Notta Ai were carefully reviewed and cross-checked for accuracy by the researcher to maintain data integrity.

For the analysis of qualitative data, the research employed the use of Atlas.ti, a powerful software tool specifically designed for qualitative data analysis. Atlas.ti was selected based on its comprehensive features and capabilities, which facilitated efficient coding, categorization, and interpretation of the data. The software allowed for systematic organization and management of the data, enabling the researcher to identify patterns, themes, and relationships within the dataset. It should be emphasized that strict measures were taken to ensure the confidentiality and security of the data throughout the analysis process. I conducted the coding and analysis in Atlas.ti, meticulously reviewing and cross-referencing the coded data to ensure accuracy and reliability in the interpretation of the findings.

In adherence to ethical guidelines, proper measures were taken to ensure the protection of participants' privacy and confidentiality during the use of Atlas.ti. Prior informed consent was obtained from all participants, clearly outlining the purpose of the study and how their data would be used. Any personally identifiable information was anonymized or pseudonymized to maintain confidentiality. Access to the Atlas.ti project and the stored data was strictly limited to the me, and data was securely stored with password protection. Furthermore, any excerpts or quotes used in the analysis were carefully selected and presented in a way that ensured the anonymity of the participants. The research was conducted in accordance with ethical standards to uphold the rights and well-being of the participants throughout the entire research process.

4. Empirical findings & Analysis

This study uses the grounded theory developed by Strauss and Corbin in 1990 to analyze empirical findings through three phases of coding: open, axial, and selective. The first phase, open coding, aims to identify initial concepts and themes from the empirical data. Axial coding is used to develop categories and subcategories and relate them to each other, while selective coding integrates the categories and subcategories into a theoretical framework. Through these phases, the study draws out themes and categories from the empirical data to define and understand its meaning.

The empirical data yielded 68 open codes and 16 axial codes, which led to the creation of five theoretical categories that form the basis of the findings and analysis sections (Table 2). These categories were identified based on the similarities and relationships between codes through the process of writing memo notes. All interviews were conducted in English. During the data analysis process, specific problems were identified and marked with an "E" to indicate applicability to employees, a "C" to indicate applicability to clients, or "E/C" to indicate applicability to both.

Table 2: Coding results

<table>
<thead>
<tr>
<th>Theme</th>
<th>Axial codes</th>
<th>Open codes</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimation and Pressure to meet tight project timelines</td>
<td>Deadline pressure</td>
<td>E</td>
<td></td>
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<tr>
<td></td>
<td>Incomplete Renders</td>
<td>E</td>
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<td></td>
<td>Client expect fast delivery</td>
<td>C</td>
<td></td>
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<tr>
<td>Theme</td>
<td>Axial codes</td>
<td>Open codes</td>
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<tr>
<td>Theme 1: Pricing and Markup</td>
<td>Lack of standardized pricing and markup and markup information</td>
<td>Making mistakes in pricing</td>
<td>E</td>
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<td></td>
<td></td>
<td>Missing out details in quotations</td>
<td>E</td>
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<td></td>
<td></td>
<td>Lack of uniformity</td>
<td>E</td>
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<tr>
<td>Misleading budget</td>
<td>Clients budget indecisiveness</td>
<td>C</td>
<td></td>
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<tr>
<td></td>
<td>Clients misleading budget</td>
<td>C</td>
<td></td>
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<tr>
<td></td>
<td>Clients need for alternative pricing</td>
<td>C</td>
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<td></td>
<td></td>
<td>Manual furniture selection</td>
<td>E/C</td>
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<td>Manual GA discussion</td>
<td>E/C</td>
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<td></td>
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<td>Manual order identification process</td>
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<td>Manual loyalty management</td>
<td>E</td>
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<td></td>
<td></td>
<td>Usage gathering requirements process</td>
<td>E</td>
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<td></td>
<td>Need for perfect furniture fit</td>
<td>E</td>
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<tr>
<td>Internal Brand Awareness</td>
<td>Furniture lack of knowledge</td>
<td>E</td>
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<tr>
<td>and Furniture Search</td>
<td>Look for ideas externally</td>
<td>E</td>
<td></td>
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<tr>
<td>Challenges for Design Teams</td>
<td>Clients need for style options</td>
<td>C</td>
<td></td>
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<tr>
<td></td>
<td>Regular customization requests</td>
<td>C</td>
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<td></td>
<td>Need for branding match</td>
<td>C</td>
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<td></td>
<td>Need for particular brands</td>
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<td></td>
<td>Clients need for ergonomics</td>
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<td>Clients need for samples</td>
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<td>Clients need for visuals</td>
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<td>Clients need for wow effect</td>
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<td></td>
<td>Need to copy existing office</td>
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<td>Demand for tailored furniture</td>
<td>Need to copy existing project</td>
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<td>solutions</td>
<td>Need to match existing furniture</td>
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<td>Need for additional furniture</td>
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<td>Client knowledge gap and expertise deficit</td>
<td>Need for clients education</td>
<td>C</td>
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<td></td>
<td>Clients Lack of Experience in design</td>
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<tr>
<td>Theme</td>
<td>Axial codes</td>
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<tr>
<td>Collaboration and communication</td>
<td>Internal communication breakdowns</td>
<td>Clients need for professional advice C</td>
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<td>Communication breakdowns E</td>
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<td>Lack of communication between E project managers and suppliers E</td>
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<td>Inadequate communication channels E within the company E</td>
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<td>Conflicting information among E different departments E</td>
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<td>Clients' unrealistic expectations and Clients' indecisiveness</td>
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<td>Clients unrealistic requirements C</td>
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<td></td>
<td>Slow estimation timeframe E</td>
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<td>Slow client approval times E</td>
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<td>Projects overload E</td>
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<td>No change management process E</td>
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<td>Schedule conflicts E</td>
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<td>Regular revisions E</td>
<td>E/C</td>
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<td>Long client presentation E</td>
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<td>Slow Invoice Processing Times E</td>
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<td>Lack of Visualization E</td>
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<td>Challenges in managing project stakeholders</td>
<td>Having external designer C</td>
<td>Multiple Stakeholders Involvement C</td>
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<td>Not working with end client E/C</td>
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<td>Procurement and supply chain management</td>
<td>Inconsistent supplier pricing and response times confirmations</td>
<td>Slow supplier confirmation times E</td>
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<td>Slow supplier response times E</td>
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<td>Slow supplier response times E</td>
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<td>Manufacturing delays E</td>
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<td>Logistics and shipment issues E</td>
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<td>Need for shipments combination E</td>
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<td>Delays in supply E</td>
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<tr>
<td>Slow invoice processing and payment collection</td>
<td>Manual pending invoice follow-up</td>
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<td>Manual procurement and documentation practices with outdated tools and methods</td>
<td>Manual payment collection follow-up</td>
<td>E</td>
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<td>Manual procurement documentation</td>
<td>Usage of hard-copies</td>
<td>E</td>
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<td>Loyalty to outdated software</td>
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<tr>
<td>Customer satisfaction and post-purchase support</td>
<td>Post-order and post-delivery concerns and Fit and finish issues</td>
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<td></td>
<td>Snagging issues</td>
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<td></td>
<td>Post-delivery unsatisfaction</td>
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<td>Post-order change</td>
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<td>Post-warranty concerns</td>
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<td>Need to change existing floor plans</td>
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<td></td>
<td>Request for refunds</td>
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<tr>
<td></td>
<td>Reupholstery</td>
<td>C</td>
<td></td>
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</tbody>
</table>

4.1 Estimation and budgeting

4.1.1 Pressure to Meet Tight Project Timelines

Through analyzing the various quotations provided, it is clear that there is significant pressure to meet tight project timelines. This pressure can come from a variety of sources, including deadline pressure, client expectations for fast delivery, and incomplete renders. Participant E4 highlighted the issue of deadline pressure, stating: "The workflow I think there should be more coordination with commercial all the time. We are the last time, for example, with the dead we're just concerned with the deadline."

Participant E6 noted that deadlines often change unexpectedly, saying: "Okay. For example, the deadline is next week and then suddenly it moves to Friday. Okay. So we're always the last one to know about this last one."

Client expectations for fast delivery were also a recurring theme. Participant E3 noted that customers "are not willing to wait like three, five days or five reputations or anything they request, they expect it immediately."

Participant E1 discussed how tight timelines can impact the quality of work, stating: "If we don't have time, let's say it's a tender. Yeah. The timelines are unrealistic. They want everything in one day. Then we just put okay, sometimes, yes, we let go of that."

Incomplete renders were also mentioned as a potential cause of timeline pressure. Participant E1 noted that they only focused on certain areas when creating renders, saying:
"So I told account manager, in renders, I am doing only these areas."

Participant E9 discussed how renders are often completed after a project has already been won, stating:
"Money is already here. Mainly for winning the project."

These findings suggest that there is a need for better coordination between the different departments to ensure that deadlines are communicated effectively, and any changes are made known as soon as possible. It is also important to manage client expectations and educate them on the challenges of meeting tight project timelines, especially when it comes to the impact on quality.

Furthermore, it is essential to prioritize tasks and allocate resources effectively to ensure that renders are completed in a timely manner. This will require a clear understanding of which areas are most important to focus on and which can be deprioritized if necessary.

4.1.2 Lack of Standardized Pricing and Markup Information

One of the main issues highlighted by the speakers is the lack of markup information, which can lead to missing details in quotations:
"Sometimes we don't get the full information and that's the difficulty there" (Participant E5)

Without complete information, it can be challenging for workers to execute their tasks correctly, leading to pricing mistakes. Participant E2 notes that the most difficult part of the job is being accurate with pricing, as even small errors can have significant consequences: "Because we need to be accurate with the pricing. Because it's like a contract that the client will check the price one by one."

Another issue highlighted by the speakers is the lack of uniformity in pricing and markup information. This can lead to confusion and difficulty in understanding for both workers and clients:
"There is no uniformity and that's the worst" (Participant E5)
"One person has made this product, another person has made this product" (Participant E6)

According to Participant E12:
"If they look at the boq, they would appreciate it because it's easier for them to understand anything else."

Additionally, uniformity is crucial because clients need to be able to understand the pricing and what they are paying for. Without uniformity, clients may struggle to comprehend the information, leading to further complications: "They pay for it. So if you put the wrong pricing for us, so. Right? No. Yeah. So we need to be, like, accurate" (Participant E4).

Additionally, a lack of uniformity can lead to confusion and difficulty in understanding, making it crucial for businesses to strive for consistency in their pricing and markup information.

4.1.3 Misleading budget

One of the main challenges designers face is clients’ budget indecisiveness. Clients may have a limited budget and may not be forthcoming with their true budget. This can lead to
negotiation and compromise throughout the project, and may result in the client wanting more than they can afford. As Participant E2 stated: 
"I want clients to say their true budget."

Another challenge is clients misleading budget. Designers have to work within a budget, and clients may not understand the true cost of certain design choices. It was observed with Participant C14 while discussing the budget: "50 to 90 per square foot, something like that."

It was also mentioned several times by Participant E2 and Participant E3.

This lack of understanding can lead to unrealistic expectations and disappointment later on in the project.

One of the most significant findings was that clients expressed a need for alternative pricing options. They want to have more options when it comes to pricing, which is understandable since different clients have different budgets. Participant C14 expressed "a desire to see different price points". This feedback highlights the importance of offering clients different pricing options to cater to their varying budgets.

4.2 Design and customisation
4.2.1 Manual Processes in Furniture Design and Selection

The interviews conducted with furniture designers and selection professionals reveal many processes that are still done manually. These processes, such as brainstorming, design workshops, furniture selection, general arrangement plan discussion, order identification, loyalty management, and gathering requirements, involve a lot of physical work, such as writing, drawing, and taking photographs.

As Participant E1 explained: "And then we literally brainstorm on top of it on the table using prints and documents."

This manual process of brainstorming allows for a hands-on approach that designers believe is essential to creating the perfect piece of furniture.

Participant E10 described the manual design workshop process, stating: "in a meeting for a couple of hours, get the GM, sit there and write on the drawing."

The physical act of drawing and writing allows for a collaborative atmosphere that is difficult to replicate with automated tools.

However, the interviews also revealed that some manual processes can be time-consuming and inefficient. For example, furniture selection often involves taking screenshots or writing down names of furniture from websites, which can be a slow and error-prone process. Participant E2 stated: "Went to their websites and took screenshots. Why? That's what I mean. That's what we usually do. Okay. Yeah. Why? Sometimes we don't even do screenshots, actually. If you see our Head Designer’s Markups, she literally just writes the name."

In addition, loyalty management often relies on manual meetings with clients, which can be difficult to schedule and manage. As Participant E3 noted: "no limited numbers or anything specified, but I set myself like at least to meet directly. Go and meet at least five clients a week on minimum trying to because many of the time, if there is no requirements, they will not be much interested."
Overall, the interviews with furniture designers and selection professionals shed light on the importance of manual processes in the industry, but also point to the need for more efficient and automated tools to facilitate these processes in the future.

4.2.2 Internal Brand Awareness and Furniture Search Challenges for Design Teams

"designs are often not linked to real furniture, which can make it difficult to propose furniture that works with the design and fits within a narrow budget," according to the interview with Participant E1.

Another challenge is the "lack of knowledge about furniture among design teams” (Participant E1).

As Participant E3 stated, "Clients may ask for specific types of furniture that the team has no clue where to find."

In some cases, material specialists can help guide the team towards brands and materials that fit within the budget. However, designers may still struggle to understand the "cost of certain furniture items or the availability of specific materials," as Participant E2 mentioned.

To overcome these challenges, designers often look for ideas externally, through online stheces like Pinterest or Google. They may also keep inspiration images for future use. However, as Participant E1 pointed out: "this approach can be time-consuming and may not always yield the desired results."

The research highlights the importance of improving internal brand awareness and knowledge of furniture among design teams. By better understanding the available furniture options and their associated costs, designers can make more informed decisions and propose furniture solutions that better align with client needs and budgets. As Participant E11 stated: "the more we know, the better we can do the job."

4.2.3 Demand for tailored furniture solutions

Through the research, I have found that there is a growing demand for tailored furniture solutions among clients. Many clients have a need for alternative options and regular customization requests. "They want to have more choices when it comes to design and style” was stated by Participant E1. The same interviewee stated that they "usually base their decisions on the visuals that are closest to the chair they have chosen and within their budget range”. Participant E5 mentioned "the need for mood boards that present different styles”. This feedback highlights the importance of providing clients with various design options to suit their preferences. Clients often desire "options of mood boards. When the client is unsure about what they want, then you have to give them, like, a set of different styles." as stated by Participant E12.

Additionally, there is a need for branding color match. As Participant E3 explained: "They had 20 colors in their branding and they wanted every single color to be used in the office."

Some clients also have a specific brand preference and request: "...a design package with those brands, with those suppliers." That was mentioned by Participant C13 during the meeting with the design team for furniture selection that I was shadowing. In some
cases, clients want to change the existing floor plans or copy an existing office design. Participant E2 and Participant E3 stated, "Few clients, they tell us that they want their design to match it to their previous office" and "it should look like the DIFC office." Another client wanted their office to look like a particular project they saw on the website or in Live. by Participant E12 confirmed this by saying: "They saw something on the website, they like, they want to copy that." Matching existing furniture is also important to some clients. Participant E6 explained: "they selected before has to be the same." Participant C13 shared this sentiment, saying: "I want the same furniture that I have in the previous office, I want the same thing." Finally, some clients require additional furniture for their office space. As Participant E2 described: "Or they need additional furnitures in this office spaces, then we go and take down the details and we provide them with the costings, we arrange for the deliveries and everything with the support of the operations." Participant E12 added that they needed "additional furniture, like the sofas, the rugs, the armchairs, and the coffee tables."

Clients expressed a desire for ergonomic furniture. “With many people working long hours at their desks” (Participant E1), clients want furniture that is comfortable and supports their bodies, especially during long hours of sitting. Participant C14 stated that they “want chairs that are ergonomic”. Clients also expressed a need for samples to test out furniture. This feedback is crucial since it allows clients to test the furniture to ensure it is comfortable and meets their needs. Participant E2 mentioned that: "they had asked for two samples to be sent to their office so that all employees could sit and rate the chairs". Clients expressed a need for visuals to help them better understand the design. With visual aids, clients can have a better understanding of how the furniture will look in their space. Participant C14 stated that: "visuals help generate ideas and enable them to visualize how they can improve their new space." Another significant finding was that clients expressed a desire for a "wow effect" and for furniture to be visually appealing. Clients want furniture that is not only functional but also aesthetically pleasing. Participant E1 stated that: "most people don't see furniture; they see style." This feedback highlights the importance of having furniture that is not only functional but also visually appealing. Finally, clients expressed a need for designers to take into account their unique business needs. Participant C14 stated that “they know their workflow better than the designers and can provide suggestions”. Participant C13 mentioned that “they want specific teams to be seated together.” The analysis shows that clients have a strong desire for customized furniture solutions and a willingness to work collaboratively with designers to achieve their desired results.

4.2.4 Client knowledge gap and expertise deficit

One notably recurring theme was the clients' expressed need for advice and guidance from experienced professionals in the industry. As Participant E3 noted: "Usually we sometimes have quite indecisive clients. That's always a struggle, can't figure out which direction they want to go. So you put together lots of different products so that can delay things, the back and forth." Participant E12 expressed that they need help to: "advise how they should sort of work" and to "suggest a cost saving elsewhere." Additionally, Participant E2 mentioned that they can "start to tweak products to generate cost savings."
This highlights the importance of having professionals who can provide expert advice and guidance throughout the decision-making process and help clients make choices that align with their vision and goals. Another crucial theme that emerged from the research was the clients' expressed need for education on the design process. As Participant E9 noted: "you send a layout, is it in PDF form? It is usually in PDF format because they don't know how to read, how the process of change in it works." Participant E12 expressed that they need help to understand "how many persons they want to fit in that space" This lack of knowledge can lead to delays and misunderstandings, highlighting the importance of educating clients on the design process. By providing clients with clear and concise explanations of the design process, professionals can help them understand the timeline, scope, and potential challenges of their project, leading to more informed decision-making and fewer misunderstandings. A third theme that arose from the research was the clients' lack of experience in design. As Participant C14 stated: "it's their first project." This lack of experience can lead to confusion and uncertainty on the part of the client, highlighting the need for professionals who can provide guidance and expertise. Participant EE9 expressed that: "it's always good to educate a client." By leveraging their experience and expertise, professionals can guide clients through the design process, helping them make informed decisions and create successful projects. Overall, the empirical analysis and findings suggest that there is a clear need for professionals who can provide both advice and education to clients in the design and furniture industry. By addressing these gaps in knowledge and expertise, professionals can help clients make informed decisions, avoid delays and misunderstandings, and create successful projects that meet their vision and goals.

4.3 Collaboration and communication

4.3.1 Internal communication breakdowns

One of the most prevalent issues that emerged was a lack of information sharing. As Participant E4 stated: "we don't get the information sometimes" and "we don't know what's happening with the project unless the design gives us instruction." This suggests that there is a need for more open channels of communication within the organization to ensure that all team members have access to the information they need to complete their tasks successfully. Another issue that was highlighted in the transcripts was the lack of consideration for furniture lead times by the design and sales teams. As Participant E6 noted: "they don't necessarily consider the furniture side all the time." This suggests that there is a need for cross-departmental collaboration to ensure that all aspects of a project are taken into account. By working together, teams can identify potential roadblocks and plan accordingly to ensure that projects are completed on time and within budget. Additionally, it was noted that there is often confusion surrounding project deadlines. Participant E5 stated: "for example, the deadline is next week and then suddenly it moves to Friday. Okay. So we're always the last one to know about this last one." This highlights the need for clear and consistent communication regarding project timelines. By establishing clear deadlines and communicating them effectively, teams can avoid misunderstandings and ensure that everyone is on the same page. Another issue that was raised in the transcripts was the lack of communication between teams. As Participant E10 noted: "there's a lot of communication that needs to happen, but sometimes it doesn't
happen." This suggests that there is a need for better communication channels to ensure that all teams are aware of what's happening in a project. Furthermore, it was noted that there is often a lack of communication around changes to a project. As Participant E5 stated: "we would know if they had the meeting here, and then if they change something, we would only know on the latter part because we already made the quotation."

This highlights the need for more timely communication around changes to a project to ensure that all teams are aware of any updates.

4.3.2 Clients' unrealistic expectations and indecisiveness

Clients may have unrealistic requests, such as wanting a table that is too large for the space. As Participant E12 stated that clients: "want to have a ridiculous sized table or something." These unrealistic requests can make it challenging for designers to deliver a successful project while still meeting the client's needs. Finally, clients may struggle to envision the final product, which can make decision-making more difficult. Designers may need to provide visualizations to help clients understand the design. As Participant E9 stated: "If we win the project already, right? We have the aloe in hand, we got the money. Yeah, then we do render. Money is already here. Mainly for winning the project." Clients can also be indecisive, particularly when presented with a large number of options. Designers may need to limit options to make the decision-making process easier. As Participant E12 stated: "People won't want too many options because then they can't make a decision."

4.3.3 Inefficient project management processes

Through the interviews with project managers, I identified several areas where project management processes were inefficient. These areas included slow estimation timeframes, slow client approval times, slow invoice processing times, projects overload, no change management process, schedule conflicts, regular revisions, and long client presentations. In regard to slow estimation timeframes, Participant E3 noted: "The quotation process could be much faster." Meanwhile, slow client approval times were highlighted as an issue because "when we inform the client that the parts are chargeable, we get the pricing from the factory, and then we provide that information to the client." (Participant E8). Slow invoice processing times were also identified as a problem, with Participant E7 noting that: "when we request invoices, they often get stuck or are pending for a long time," and "it takes a long time to receive invoices from the accounts department." Additionally, projects overload was cited as a significant issue, with Participant E1 noting that: "the team is just very overwhelmed" and that "barely had any time, actually, so I barely had any time." In terms of change management, interviewees noted the importance of having a process in place for handling changes. Participant E11 explained: "if there are some changes change request, then change request, then check it with the supervisor and everything." Participant E10 noted that: "it happens frequently that on the last minute they have to change the sofa." Schedule conflicts were also identified as a problem, with Participant E4 explaining that: "you have to speak to the other project managers whether we can move the other schedule" in order to accommodate urgent projects. Finally, regular revisions and long client
presentations were also identified as issues. Participant E6 noted that: "will revision of the items will need to change or there's a revision for quantity because the layout changed something like that we need to omit some items or we need to add some items," while Participant E2 noted that "clients will not read long descriptions."

### 4.3.4 Challenges in managing project stakeholders

The research on the challenges of managing project stakeholders involved conducting interviews with several industry professionals. The analysis of the interviews revealed some key findings that are outlined below.

The first challenge identified was having an external designer. According to Participant E2: "Sometimes the client has their own boq because the client might have their own designer."

This can create conflicting priorities between the client's designer and the project team, making it difficult for project managers to ensure that the project is running smoothly.

The second challenge identified was managing multiple stakeholders. Participant E3 noted that "about 10 people" should not be involved in the project, as too many stakeholders can lead to communication breakdowns and make it difficult to make decisions.

Finally, the interviewees noted that working with a designer who is not the end client can be challenging. As Participant E9 noted: "Typically designers are not the person purchasing, so they're not the buyer."

This can create challenges in managing expectations and ensuring that the project meets the needs of the end client.

### 4.4 Procurement and supply chain management

#### 4.4.1 Inconsistent supplier pricing and response times

During the interviews, several issues were identified with supplier pricing and response times. Here are some direct quotes from the interviewees:

"You send the request to the supplier, but following up with them takes too long." (Participant E8)

"Sometimes they review it, come back, and say the price to the old one may be different." (Participant E2)

"It takes one to three days to get the final price." (Participant E6)

"All of them have a different way of sending the confirmations." (Participant E7)

"Sometimes some other supplier, local supplier is taking five to seven days. So when the order is placed, when we started placing the order, the lead time of the client lead times ten to twelve weeks, that lead time itself starts from that date." (Participant E8)

One common issue was long supplier response times. Interviewees reported that following up with suppliers after submitting a request could take too long, causing delays in the ordering process. This issue highlights the need for suppliers to be more responsive and timely in their communication.

Another issue that was identified was inconsistent pricing confirmations. Some interviewees reported that suppliers were not providing accurate pricing information or were changing their prices after providing an initial quote. This issue can cause confusion.
and delays in the ordering process. To address this issue, suppliers need to be more transparent with their pricing information.

Slow supplier confirmation times were also identified as a specific issue. Some suppliers took longer than others to provide final pricing information, causing delays for buyers. This issue can be particularly problematic for buyers who are working on a tight deadline or have customers who are expecting quick turnaround times. To address this issue, suppliers need to prioritize and streamline their communication processes.

Inconsistency in communication methods was also identified as an issue. Suppliers were found to be using different methods to confirm orders, which can be confusing for buyers. A standardized communication process could help streamline the ordering process and reduce errors.

Finally, slow supplier confirmation times were found to have a significant impact on lead times. Delays in supplier confirmation can cause delays in the overall ordering process, leading to longer lead times. This issue can be particularly problematic for buyers who have customers who are expecting quick delivery times. To address this issue, suppliers need to be more efficient in their confirmation processes.

4.4.2 Delays in supply and logistics

One of the most significant issues that emerged from the interviews was slow supplier response times. This problem was identified by several interviewees, who noted that following up with suppliers can take a long time. Participant E7 stated:
"You send the request to the supplier, but following up with them takes too long."

This delay can cause significant disruptions to the supply chain process, leading to delays in production and delivery of goods.

Another issue that was identified was delays in supply. One interviewee noted that delays in projects and furniture delivery were all out of their control as a business. The other shared their experience of waiting a long time for the order confirmation to be sent. These delays can cause frustration for both businesses and customers, leading to potential lost sales and decreased customer satisfaction.

Logistics and shipment issues were also highlighted as a major concern. The other interviewee mentioned how they combine products from different suppliers in one container, but not from different suppliers that are competitors. This practice can cause complications in the shipping process and lead to increased costs.

Manufacturing delays were another challenge identified in the interviews. The participant stressed the need for the quickest possible manufacturing process, highlighting how delays in production can cause significant disruptions to the supply chain process. In terms of temporary solutions, interviewees suggested lending items that were available in stock. Participant E2 stated:
"For temporary, we can lend."

This solution can help businesses to continue their operations while waiting for the delivery of their goods.

Additionally, combining shipments from multiple brands was identified as a way to save on shipping costs. Participant E7 noted:
"It's better to combine the orders into one shipment."
This solution can help businesses to cut down on shipping costs and streamline their supply chain processes.

4.4.3 Slow invoice processing and payment collection

According to the interviews conducted, participants emphasized the need for timely payments and effective follow-up procedures. Participant E7 stated: "Delay in payment can disrupt the supply chain and create a negative impact on the business. That's why we have a strict follow-up process."

Participant E8 added: "Following up with suppliers who haven't made payments is crucial. It's important to stress the importance of paying on time to avoid delays in the supply chain."

These sentiments were also reflected in the manual pending invoice follow-up process, where a Participant E7 stated: "I always make sure to check for any pending work that I left out the previous day. Following up via email is important to ensure we receive payment on time."

Participant E8 participant highlighted the importance of communication in the manual payment collection follow-up process, stating: "No supplier will release their goods without receiving payment. That's why we need to follow up and stress the importance of paying on time to avoid any delays."

In summary, the interviews conducted and the manual follow-up processes highlight the significance of effective follow-up procedures and timely payments in ensuring a smooth supply chain process.

4.4.4 Manual procurement and documentation practices with outdated tools and methods

All participants mentioned the manual data entry process as a significant component of their procurement activities. Participant E7 stated: "I'm the one who enters everything in Excel". Participant E8 mentioned that "60% of the time they are doing inputs." This finding indicates that manual data entry is still prevalent in procurement activities despite the availability of digital procurement systems. Participants expressed mixed opinions regarding the usage of hard-copies in procurement documentation. Participant E7 mentioned: "If you open that hard-copy, you have the blue, you have the LPO, you have the audio confirmation, you have the client as a buyer LPO and you have the client confirmation."

Participant E8 preferred digital procurement documentation, stating: "I think for me, if it is in the cloud, much better. As long as it will not be deleted in." This finding suggests that procurement professionals differ in their preferences regarding the usage of hard-copies in procurement activities. Some participants expressed loyalty to outdated software in their procurement activities. Participant E2 stated: "I normally use Excel sheet, as I am used to it." Participant E7 mentioned that they used outdated software because "it's not yet available in SAP program." This finding suggests that procurement professionals may continue to use outdated software despite the availability of modern digital procurement systems.
4.5 Customer satisfaction and post-purchase support

4.5.1 Post-order and post-delivery concerns and issues

In the world of furniture sales, post-order and post-delivery concerns can arise, leaving customers with a feeling of dissatisfaction. These concerns can range from issues related to the fit and finish of the furniture, post-delivery unsatisfaction, post-order changes, post-warranty concerns, requests for refunds, and reupholstery.

Fit and finish issues are one of the most common problems that customers face. Customers are often displeased with the visual appearance or comfort level of the furniture they receive. They may find that the product does not fit into their desired space, or the furniture may not be as comfortable as they expected. As Participant E2 stated: "they might say, oh no, this particular fabric looks cheap."

The fit and finish of the product can make or break the customer's experience, and it is vital that companies take these concerns seriously. They want furniture that fits well and is of high quality. Participant E1 mentioned that they the clients concerned about "how some product ranges may not fit exactly into the space, which is not what they expected".

Clients also expressed a need to physically test out furniture to ensure that it is comfortable and meets their needs.

Post-delivery unsatisfaction is another category that can lead to customer dissatisfaction. Customers may have different opinions about the quality or appearance of the furniture after delivery. As Participant E12 stated: "furniture is something that's related to ergonomics; something can look amazing when you look at a picture, but when you actually go and sit on it."

This highlights the importance of ensuring that the product is comfortable and of high quality, not only visually appealing.

Post-order change is another category that highlights the challenges that customers may face when trying to change their orders. As Participant E3 mentioned: "sometimes also during ordering there's a lot of times as well that during ordering we have already placed the order."

This can leave customers feeling frustrated and helpless, as they may not be able to make changes to their order even if they realize that something is incorrect or needs to be changed.

Post-warranty concerns illustrate the importance of supporting customers beyond the warranty period. Participant E2 emphasized: "we don't leave the clients over them, but we continue supporting them for future requirements or if there is any warranty issues and things like that."

This shows that companies must provide support even after the warranty period has ended to ensure customer satisfaction.

The request for refunds category highlights the difficulties that customers may face when trying to get a refund. As Participant E12 said: "some clients will say, we've had to find a poke. We finalize a contract with you. Sorry, we can't we can't possibly reupholster it or do this, do that, sorry. And but we can't refund the products."

This emphasizes the need for companies to have clear refund policies and to communicate them effectively to customers.

Finally, the reupholstery category emphasizes the need to address issues related to existing furniture rather than just focusing on new orders. As Participant C14 mentioned:
"We just need to get re-upholstery price for the products of the existing furniture for the hotel because I think they need to re-upholster."

This shows that companies must provide support for customers who have already purchased their products, not just those who are making new orders.
5. Discussion

5.1 Main findings

The commercial furniture industry is constantly evolving, with digital technologies playing an increasingly important role in the sales process. However, internal limitations within companies can often lead to problems with customer satisfaction, ultimately impacting sales. In this section of thesis, a model will be presented that is visualized as a customer journey map, highlighting the various touchpoints between a company and its customers throughout the sales process. By analyzing these touchpoints and identifying pain points and limitations within the company's internal processes, improvements can be made to enhance customer satisfaction and increase sales. The model will focus on key factors driving successful fit-out and interior design projects, with a particular emphasis on creating an effective e-commerce platform for commercial furniture sales. The journey map will highlight the various touchpoints, including the website, sales team, product configurator, installation team, and post-purchase support, and show how digital technologies can be utilized at each stage to improve the customer experience and ultimately drive sales.

The research conducted for this thesis showed several challenges that can impact the ability to deliver high-quality products and services to clients.

5.1.1 Estimation and budget

Through interviews conducted, it was found that clients' budget indecisiveness and misleading budgets pose a challenge to designers. Additionally, clients expressed a desire for alternative pricing options to accommodate their varying budgets. These findings are supported by experts in scientific articles, which suggest that a positive relationship exists between participative budgeting and budget goal commitment, and that the use of budget information mediates the relationship between budget goal commitment and performance (Macinati & Rizzo, 2014). Budgetary participation alone does not directly influence the use of budget information. However, the level of budget goal commitment is encouraged by the positive motivational consequences of participative budgeting, which, in turn, influence the use of budget information (Macinati & Rizzo, 2014). Furthermore, the relationship between budget goal commitment and performance is not direct but is mediated by the use of budget information (Macinati & Rizzo, 2014).

Digital tools have been used to automate and streamline the construction cost estimating process. Specialized software such as ProEst, CostX, and Sage Estimating are widely used in the construction industry. These tools provide comprehensive features for creating accurate cost estimates, including material takeoff, labor calculations, subcontractor management, and cost database integration (M.F. et al., 2014). BIM software, such as Autodesk Revit and ArchiCAD, allows construction professionals to create virtual 3D models of buildings or structures. These models can be used to extract quantities, generate cost reports, and perform accurate cost estimations based on the detailed information captured within the model (M.F. et al., 2014). Recent studies have
shown that these tools have the potential to improve the accuracy and efficiency of cost estimating (Lee et al., 2012). Several studies have found that digital tools can help reduce errors, increase accuracy, and decrease the time required to complete estimates (Culler & Burd, 2007; García de Soto et al., 2017).

5.1.2 Design and customization

The research done in this thesis work found that manual processes are still widely used in furniture design and selection, which include brainstorming, design workshops, furniture selection, general arrangement plan discussion, order identification, loyalty management, and gathering requirements. These processes require a lot of physical work, such as writing, drawing, and taking photographs. However, some manual processes can be time-consuming and inefficient, such as furniture selection, which often involves taking screenshots or writing down names of furniture from websites, and loyalty management often relies on manual meetings with clients, which can be difficult to schedule and manage (based on the conducted research). This is consistent with the research done by Dang & Vartiainen (2019) who found that loyalty management often relies on manual meetings with clients. Despite the advent of advanced technology, many designers still prefer manual processes as it allows for a hands-on approach and a collaborative atmosphere that is difficult to replicate with automated tools. This is aligned with the research done by Lacka & Chong (2016) who found that B2B companies are feeling the urgency to shift towards digital technologies, but many are disoriented on how to maintain a relational approach by integrating human and digital technologies. However, the interviews with furniture designers and selection professionals reveal that there is a need for more efficient and automated tools to facilitate these processes in the future to save time and increase productivity. By using digital tools firms can automate and streamline these processes, making them more efficient and effective. For example, Mengoni et al. (2014) proposed a web-based collaborative platform for furniture design that allows users to work together remotely and in real-time, reducing the need for face-to-face meetings and manual brainstorming sessions. A practical example of such a platform was developed by Herman Miller who use a web-based collaborative platform called "Living Office" to work with their clients to design and customize office furniture solutions (Living Office - Herman Miller, 2023). The platform allows clients to participate in the design process remotely and in real-time, reducing the need for manual brainstorming sessions and face-to-face meetings.

Another identified issue faced by design teams in the furniture industry includes a lack of knowledge about furniture and difficulty in linking designs to real furniture. Designers often look externally for ideas and inspiration, but this approach can be time-consuming and not always effective. In addition, it leads to unrealistic expatiations by the clients who then face with the issue of not having specific design in stock which ultimately leads to their unsatisfaction. Moreover, as one designer stated, clients may ask for specific types of furniture that the team has no clue where to find. The study highlights the importance of improving internal brand awareness and knowledge of furniture among design teams to better align with client needs and budgets which is aligned with the research by Heinold et al. (2022) who stated that designers who have a better understanding of available furniture options and their associated costs can make more informed decisions.
Lacka and Chong (2016) and Catlin et al. (2017) found that B2B buyers increasingly search for products and services online and rely on human support only when necessary. To address this challenge, designers can keep inspiration images for future use and work with material specialists who can help guide them towards brands and materials that fit within the budget (Corsaro and Anzivino, 2021). The research in this thesis project also found that designers struggle to understand the cost of certain furniture items or the availability of specific materials. To overcome this challenge, designers can work with material specialists and suppliers who can provide them with accurate information about the cost and availability of furniture items and materials.

Another finding shows that clients have a growing demand for tailored and customized furniture solutions. This includes options for mood boards, branding color match, matching existing furniture. Clients desire ergonomic furniture, samples to test out furniture, and visuals to help them better understand the design. This is consistent with the study published by openaccessgovernment (2023) who found that ergonomic features are important factors for customers when purchasing office furniture.

This thesis research also showed that customers want furniture to be visually appealing and designers to consider their unique business needs. Digital tools can help automate and streamline the design and customization process for furniture dealers. By providing online customization options, clients can select their preferred style, size, color, material, and other design features, which can be easily generated by the software. For example, Oh et al. (2008) found that customers who used online customization tools had higher levels of satisfaction and were more likely to make a purchase. Customers who used 3D visualization tools had a more positive emotional response (Dores et al., 2014).

Several furniture retailers offer online customization tools to help customers visualize how furniture will look in their space before making a purchase. IKEA's online kitchen planner allows customers to customize and design their own kitchens (Kitchen Planner - Kitchen Design Tool, 2023). Design Within Reach's 3D Room Planner offers customers the ability to create a virtual room and customize it with furniture and accessories (Virtual Studio - Design Within Reach, 2023), while Pottery Barn's Room Planner (Room Planner | Pottery Barn, 2023) allows customers to change the colors, materials, and placement of furniture in the room. Wayfair's augmented reality (AR) tool allows customers to see how virtual furniture will look in their space using their smartphone or tablet (About Wayfair | Augmented Reality with a Purpose, 2023). Wayfair uses a 3D visualization tool called "Wayfair Spaces" to help customers visualize furniture products in their own homes before making a purchase (About Wayfair | Augmented Reality with a Purpose, 2023). The tool uses augmented reality technology to create a virtual representation of the customer's space, allowing them to see how different furniture products would look and fit in their home. Steelcase uses a virtual reality tool called "Steelcase VR" to design and visualize their office furniture products (unrealengine, 2023). The tool allows designers and clients to explore and customize different furniture options in a virtual environment, reducing the need for manual design workshops and manual furniture selection processes.

The research in this project also found the clients' need for advice and guidance from experienced professionals in the industry, their need for education on the design process, and their lack of experience in design. The study highlights the importance of the professionals who can provide both advice and education to clients in the design and
furniture industry. By addressing these gaps in knowledge and expertise, professionals can help clients make informed decisions, avoid delays and misunderstandings, and create successful projects that meet their vision and goals. The study by Abrell et al. (2016) suggests that companies should integrate user knowledge into their digital innovation processes to innovate proactively beyond incremental improvements in current products and services, which supports the findings that professionals need to provide both advice and education to clients in the design and furniture industry.

5.1.3 Collaboration and communication

The main findings of the research on collaboration and communication revealed several issues, including internal communication breakdowns, lack of consideration for furniture lead times, confusion surrounding project deadlines, lack of communication between teams, and lack of communication around changes to a project. These findings suggest a need for more open channels of communication within organizations, cross-departmental collaboration, clear and consistent communication regarding project timelines, better communication channels, and more timely communication around changes to a project. A literature review conducted as part of this research found that communication breakdowns and lack of collaboration are common issues in organizations, and can have negative impacts on project outcomes (Cascio & Shurygailo, 2008; Kerzner, 2017). The literature also highlights the importance of clear communication and collaboration across departments, as well as the need for timely communication around changes to projects (Kerzner, 2017; Papke-Shields et al., 2010). The use of digital platforms and tools has been shown to improve communication and collaboration across departments, as well as facilitate more timely and effective communication (Breidbach & Maglio, 2020; Corsaro & Anzivino, 2021; Sheth, 2020). However, the successful integration of digital technologies requires strong leadership, clear communication channels, and a culture of collaboration (Corsaro & Anzivino, 2021; Sheth, 2020). The digitization of B2B processes has emerged as a competitive alternative to face-to-face communication, allowing for swift, affordable, and scalable management of relationships and information sharing, especially when trust is present (Eloranta &Turunen, 2016; Richard et al., 2009). Effective communication and coordination are crucial in managing tight project timelines, emphasizing the need for clear leadership and specialized roles in agile organizations (Corsaro & Anzivino, 2021).

In addition to inefficient project management processes, and difficulties in managing project stakeholders were identified as major issues as well. Clients were found to have unrealistic expectations, such as wanting oversized furniture, and may struggle to envision the final product, making decision-making more difficult. Designers may need to provide visualizations and limit options to help clients. These findings are consistent with previous research on the topic, which emphasizes the importance of understanding and meeting clients’ needs and preferences (Pagani & Pardo, 2017). Other studies also suggest that involving clients in the design process can lead to higher satisfaction and better outcomes (Bakalova & Daneva, 2011). Additionally, effective communication and collaboration have been found to be crucial for successful design projects (Chasanidou, 2018; Maier et al., 2009; Pinch et al., 2010). A literature review of design projects has shown that there is a need for designers to manage clients' expectations effectively (Basten
et al., 2016). Clients may have unrealistic expectations due to their lack of understanding of the design process, which can lead to challenges during the project (based on the interview results). By understanding the challenges that clients face, designers can work more effectively with clients and deliver successful projects. For example, limiting options and providing visualizations can help clients make informed decisions and understand the design choices (Mengoni et al., 2014; Oh et al., 2008). In addition, the literature review highlights the importance of communication and transparency in managing clients' budgets (Taghavi et al., 2009). Clients may not understand the true cost of design choices, and designers need to be transparent in their communication about costs to manage clients' expectations effectively (Taghavi et al., 2009).

The use of design thinking can improve the furniture design process by focusing on customer needs, creating empathy, and encouraging collaboration (Lewis et al., 2017; Mishra et al., 2015; Olsen, 2014). Another study found that the use of design thinking can help designers better understand customers' needs and preferences (Seidel & Fixson, 2013). A strong brand identity and brand awareness can positively influence customers' purchase decisions. Research has shown that brand identity and brand awareness are important factors in the furniture industry (Han & Ryu, 2012). One practical example of research findings is implemented by Steelcase that has a research and design team called "Steelcase Design Studio" that focuses on understanding customer needs and preferences (Steelcase Studio • A Custom Design Experience, 2023). They use a variety of tools, such as ethnographic research, digital modeling software, and rapid prototyping, to create furniture solutions that meet customers' needs and align with their brand identity.

5.1.4 Procurement and supply chain management

The procurement and supply chain management research reveals several key findings that shed light on important aspects of the field.

Inconsistent supplier pricing and response times, as well as slow confirmation times, were found to have a significant impact on lead times in the procurement and supply chain management field. These inconsistencies and delays in communication methods can disrupt the smooth flow of operations within the supply chain. This is supported by experts in the field, such as Li & Liu (2013), who found that vendor order placement lead time delays play an important role in supply chain dynamics and contribute to its turbulence and volatility. Das & Abdel-Malek (2003) also found that order quantities and supply lead-times are the two most common changes that occur in supply chains and are most often the cause of buyer-supplier grievances.

This research on procurement and supply chain management identified several key findings related to lead times and disruptions in the supply chain process. Inconsistent supplier pricing and response times, as well as slow confirmation times, were found to have a significant impact on lead times and can disrupt operations within the supply chain. The research is supported by experts in the field, such as Lücker & Seifert (2017) who found that vendor order placement lead time delays contribute to supply chain turbulence and volatility. Additionally, delays in supply, logistics, and shipment, along with manufacturing delays, can create disruptions throughout the entire supply chain process, highlighting the need for effective management and mitigation strategies to ensure a seamless flow of goods and services. Lücker & Seifert (2017) warn that supply chain
disruptions can have a severe business impact and need to be managed appropriately. Van Hoek (1998) suggests that postponed manufacturing requires not only the reconfiguration of the logistics systems but also that of other operations in the supply chain, thus creating a cross-functional effect. Effective coordination of production and shipment schedules can result in a more streamlined supply chain, as suggested by (Banerjee, 2009). Finally, slow invoice processing times can lead to delays in project timelines, and timely payment of contractors is crucial for ensuring the continuity of works and completion of infrastructural projects within time, budget, and quality specifications. These findings are supported by the research of Maurice Paul Okeyo et al. (2015). SRM software, such as SAP Ariba, Oracle Supplier Management, or Zycus, can help streamline communication and collaboration with suppliers (Min, 2020). These tools provide a centralized platform for managing supplier relationships, including supplier performance tracking, contract management, and real-time communication. They can facilitate quicker response times and improve coordination between buyers and suppliers (Min, 2020).

The prevalence of manual data entry despite the availability of digital procurement systems was found to be a significant challenge in fully transitioning to digital platforms and maximizing efficiency and accuracy in procurement activities. It is worth noting that the reluctance to fully adopt digital systems could be one of the factors contributing to the persistence of manual data entry practices. This finding was supported by Ibem & Laryea (2014), who found that despite the progress made in the evolution and use of digital technologies in construction, there is still no single digital technology that integrates all six construction procurement activities into a system that procurers can adopt to manage the entire construction procurement lifecycle. These challenges need to be addressed to ensure a seamless flow of goods and services through the supply chain process.

The research reveals a divergence among procurement professionals regarding the usage of hard copies. This indicates that personal preferences and traditional practices still play a role in decision-making within procurement activities. The results show that personal values of professional purchasers play a key role in the procurement decision, as supported by Astner et al. (2011). Additionally, social preferences systematically affect economic decision making in supply chain transactions, as explained by Coggburn (2017); Loch & Wu (2008) found that interest group diversity, legislative professionalism, results-oriented management, and regional effects each have significant relationships to state procurement practices, which possess varying degrees of reform characteristics.

The research on procurement and supply chain management highlights the persistence of outdated software usage, despite the availability of modern digital procurement systems. This implies that organizations need to overcome resistance to change and address the barriers to adopting new technologies to enhance efficiency and effectiveness in procurement processes. This finding is supported by Abu Bakar et al. (2016), who suggest that public and private sector agencies can improve their procurement process with the use of Internet-based technologies to procure goods and services. Furthermore, Mettler & Rohner (2009) argue that technological and organizational change is necessary to efficiently use e-procurement in the future, while Padhi & Mohapatra (2010) found that management policy effectiveness and IT-readiness encourage the adoption of e-procurement and simultaneously reduce imperfections and enhance effective procurement in government organizations. EDI systems facilitate electronic communication and transaction exchange between buyers and suppliers (Min, 2020). By automating the
process, EDI can eliminate the delays caused by manual data entry and paper-based documentation. It ensures faster and more accurate order confirmation, invoicing, and other communication processes (Min, 2020).

Slow invoice processing times have been identified as a significant problem in procurement and supply chain management. Timely payments and efficient follow-up procedures are critical factors in maintaining a smooth supply chain process, as delayed payments can lead to delays in project timelines and affect the overall efficiency of the procurement process. These findings are supported by various experts in the field, including Maurice Paul Okeyo et al. (2015), who emphasize the crucial nature of timely payment of contractors in ensuring the continuity of work and completion of infrastructural projects within time, budget, and quality specifications. Kikwas (2013) further recommends that adequate construction budget, timely issuing of information, finalization of design, and project management skills should be the focus of the parties in the project procurement process to address these issues. By addressing these challenges, delays in project timelines can be mitigated, leading to smoother project execution.

5.1.5 Customer satisfaction and post-purchase support

Based on the findings from interviews conducted, it has been revealed that customers often encounter various issues related to fit and finish, post-delivery dissatisfaction, post-order changes, post-warranty concerns, refund requests, and reupholstery when purchasing furniture. These concerns need to be taken seriously by companies, and it is crucial to provide support even beyond the warranty period to ensure customer satisfaction. Particularly, the significance of addressing issues related to existing furniture, rather than solely focusing on new orders, has been emphasized through the category of reupholstery.

Research studies, as supported by experts in scientific articles, suggest that digital loyalty management can play a vital role in improving customer satisfaction and loyalty in the furniture industry. The implementation and tracking of loyalty programs using digital technology, such as mobile apps, email marketing, and social media, have been found to drive customers’ choices and encourage repeat purchases. The utilization of technology and the overall customer experience have been identified as fundamental drivers of consumer loyalty (Alshurideh, 2019). Additionally, the success of digital loyalty programs in enhancing customer satisfaction has been attributed to the positive contribution of program features (Panjaitan, 2021). Furthermore, the availability of customer-oriented technological innovations in products has been shown to increase customer loyalty, especially in the context of dynamic marketing capabilities and digital business innovation (Rodríguez-Salvador et al., 2016).

Prominent examples of digital loyalty management in action include Wayfair's "MyWay" loyalty program, which offers free shipping and discounts on eligible purchases, and Room & Board’s "The Key" loyalty program, providing early access to sales, free design services, and exclusive events (About Wayfair | Augmented Reality with a Purpose, 2023). These programs are seamlessly integrated with mobile apps and websites, allowing customers to conveniently track their rewards and benefits. By leveraging digital loyalty management strategies, companies in the furniture industry can effectively address customer concerns and enhance overall customer satisfaction and loyalty.
5.1.6 Visualization of the research

Fig. 2: White blocks demonstrate the limitations impacting customer satisfaction, the arrows directions demonstrate the relation of the factors and their impact, the colored blocks outside demonstrate digital tools that impact the limitations

5.2 Strengths and weaknesses of the study

One of the strengths of this study is that it provides a comprehensive and detailed analysis of the challenges faced by design teams in the furniture industry. The research covers a wide range of topics, including procurement and supply chain management, customer satisfaction, and post-purchase support. The study also provides insights into the importance of understanding customer needs and preferences, effective communication and collaboration, and the use of digital tools and technologies. By addressing these topics, the study provides a valuable resource for design teams, furniture companies, and other stakeholders in the industry. Another strength of the study is that it draws on a diverse range of literature and research to support its findings. The study synthesizes a wide range of sources, including academic journals, industry reports, and case studies, to provide a comprehensive understanding of the challenges faced by design teams in the furniture industry. By drawing on such a diverse range of sources, the study provides a well-rounded and evidence-based analysis of the industry.

Furthermore, the study employs complementary data collection methods by combining in-depth interviews with observations, which enhances the validity and reliability of the findings. This approach allows for a more nuanced understanding of the
challenges faced by design teams in the furniture industry. Additionally, the inclusion of participants with diverse roles within the company adds strength to the study, as it captures multiple perspectives and provides a richer insight into the challenges encountered.

Finally, the study provides practical recommendations for design teams and furniture companies to address the challenges identified in the research. These recommendations are specific, actionable, and provide a clear path for companies to enhance their efficiency, effectiveness, and customer satisfaction.

One potential weakness of this study is that it is based on the analysis of a single furniture company. While the study provides valuable insights into the challenges faced by this company, it is possible that the findings may not be representative of the broader design and furniture industry. Future research could consider conducting a comparative analysis of multiple furniture companies to provide a more comprehensive understanding of the challenges faced by the industry.

Finally, the study focuses primarily on the furniture, fixtures, and equipment specialists, and does not consider the perspectives of other stakeholders, such as suppliers or broader number of customers. Future research could include a broader range of stakeholders to provide a more comprehensive understanding of the challenges faced by the industry.

5.3 Implications for future research and industry

The findings of this study have several important implications for future research and industry. Firstly, the study highlights the importance of understanding customer needs and preferences in the design and furniture industry. Design teams and furniture companies need to develop a deeper understanding of their customers' needs and preferences to create successful projects that meet their vision and goals. This requires effective communication and collaboration between designers, engineers, and customers throughout the design and customization process. Future research could explore the use of digital tools and technologies, such as 3D modeling software and virtual reality technology, to better understand customer needs and preferences and improve communication and collaboration between stakeholders.

Secondly, the study underscores the need for effective communication and collaboration within organizations and across departments. Communication breakdowns and lack of collaboration can lead to delays, misunderstandings, and negative outcomes for projects, which can have significant implications for the industry. Therefore, it is crucial for furniture companies and design teams to prioritize and invest in improving communication channels and fostering collaboration between different departments. By doing so, companies can ensure a seamless flow of operations within the supply chain, minimize disruptions, and enhance overall productivity. This can contribute to improved project timelines, increased customer satisfaction, and ultimately, greater competitiveness in the furniture industry.

Future research could explore the use of digital platforms and tools, such as project management software and collaboration tools, to improve communication and collaboration across departments and ensure a seamless flow of operations within the supply chain.
Thirdly, the study highlights the importance of leveraging digital technologies to improve efficiency and effectiveness in procurement and supply chain management activities. Digital procurement systems and tools can help organizations streamline procurement processes, reduce lead times, and ensure a seamless flow of goods and services. By automating and digitizing various procurement activities, such as requisitioning, vendor selection, and purchase order management, companies can significantly reduce the time and effort required for these tasks. This streamlining effect can have positive implications for the industry by increasing operational efficiency, reducing costs, and enabling faster response times in procuring goods and services. Moreover, companies that adopt digital procurement systems may gain a competitive advantage by being able to deliver products more swiftly to customers, thus enhancing their overall market position.

In addition, the implementation of digital procurement tools can help reduce lead times in the procurement process. These tools provide real-time visibility into inventory levels, supplier performance, and demand fluctuations, enabling companies to make informed and timely procurement decisions. By minimizing lead times, organizations can respond more quickly to customer demands, reduce the risk of stockouts or delays, and improve overall customer satisfaction. The industry-wide implications include enhanced supply chain agility, improved customer responsiveness, and a positive impact on customer perceptions of the industry's reliability and efficiency.

Lastly, digital procurement systems contribute to ensuring a seamless flow of goods and services within the industry. By facilitating better communication and collaboration between suppliers, manufacturers, and distributors, these systems enable the smooth coordination of procurement activities. This streamlined flow can lead to improved supply chain visibility, reduced bottlenecks, and optimized inventory management. The implications for the industry include enhanced operational efficiency, minimized disruptions, and improved overall supply chain performance. Additionally, a seamless flow of goods and services can foster stronger relationships between stakeholders in the industry, promoting collaboration and driving innovation. Future research could explore the barriers and resistance to change in adopting new technologies and identify strategies to overcome these barriers and enhance efficiency and effectiveness in procurement and supply chain management activities.

Finally, the study underscores the importance of post-purchase support and customer satisfaction in the design and furniture industry. Companies need to provide support beyond the warranty period to ensure customer satisfaction and loyalty. Future research could explore the use of digital loyalty management tools, such as mobile apps and email marketing, to enhance customer experiences and improve customer retention.

6. Conclusions

In today's highly competitive business environment, companies are constantly looking for ways to improve their customer satisfaction levels. Actor-specific data plays a vital role in shaping platform growth and governance, highlighting the need for further understanding of the co-evolution of platform architecture and governance in the B2B context (Cennamo, 2020; Eisenmann et al., 2008; Rietveld & Schilling, 2021). This is especially true in the commercial furniture sales industry, where customers have high
expectations for the quality and functionality of the products they purchase. This study aimed to explore how internal limitations within a company impact customer satisfaction in commercial furniture sales, and how digital technologies can be utilized to mitigate these limitations and improve overall customer satisfaction.

The study found that internal limitations such as communication breakdowns, lack of collaboration, and inefficient project management processes can negatively impact customer satisfaction. Communication breakdowns can cause confusion and misunderstandings between different teams and departments, leading to delays and disruptions in the supply chain process. To mitigate this issue, organizations can implement regular meetings between departments to ensure clear communication and collaboration. Additionally, investing in communication tools such as messaging apps or project management software can also improve communication between team members.

Lack of collaboration between designers, engineers, and customers can also have a negative impact on customer satisfaction. This can occur when each party has a different vision for the project, leading to unrealistic expectations and making decision-making more difficult. To address this, organizations can utilize design thinking methods to involve all stakeholders in the design process and ensure that everyone's ideas and concerns are heard. Inefficient project management processes were also identified as a major issue. Slow estimation timeframes, client approval times, and invoice processing times can all negatively affect project timelines. One way to address this is to invest in project management software that streamlines the project management process and automates time-consuming tasks such as invoicing. Additionally, organizations can hire project managers who specialize in streamlining and optimizing project processes to ensure that projects are completed efficiently and effectively.

The study has concluded that while there are certain limitations to furniture design, digital technologies can be effectively utilized to address these issues and improve overall customer satisfaction. A few examples of these technologies include online customization options, 3D visualization tools, and virtual reality technologies. These tools not only provide more tailored furniture solutions, but also improve communication and streamline the design and customization processes. Furthermore, digital tools can significantly reduce the need for manual brainstorming, design workshops, and furniture selection processes, thereby making the entire process more efficient. Lastly, digital loyalty management is a great way to implement and track loyalty programs, leading to improved customer engagement and satisfaction. Overall, the use of digital technologies has proven to be a promising way to address the limitations of furniture design and enhance customer satisfaction.

The study also identified several challenges and opportunities related to procurement and supply chain management that need to be addressed to ensure a seamless flow of goods and services and improve customer satisfaction. Among the challenges identified were inconsistent supplier pricing and response times, slow confirmation times, delays in supply, logistics, and shipment, manufacturing delays, delayed payments, and inefficient follow-up procedures. These challenges can have a significant impact on the efficiency and effectiveness of a company's supply chain management. Therefore, it is important for companies to develop strategies to address them. One possible strategy could be to implement a more rigorous supplier selection process to ensure that suppliers are reliable and capable of meeting the company's needs. Another strategy could be to invest
in new technology to improve supply chain visibility and reduce lead times. Additionally, companies could consider partnering with other organizations to share resources and expertise to improve their supply chain management. By addressing these challenges and implementing these strategies, companies can ensure a seamless flow of goods and services, reduce costs, and improve overall customer satisfaction.

In conclusion, this study highlights the importance of addressing internal limitations within a company to improve customer satisfaction in commercial furniture sales. By leveraging digital technologies and effective communication and collaboration among designers, engineers, and customers, companies can overcome these limitations and provide more tailored and efficient solutions to customers. Furthermore, addressing the challenges related to procurement and supply chain management will help companies ensure a seamless flow of goods and services and improve customer satisfaction, ultimately making them more competitive in the market.

References


Cennamo, C. (n.d.). COMPETING IN DIGITAL MARKETS: A PLATFORM-BASED PERSPECTIVE.


Khodabandeh, A., & Lindh, C. (2020). The importance of brands, commitment, and influencers on purchase intent in the context of online


Kristensson, P., Magnusson, P. R., & Matthing, J. (n.d.). Users as a Hidden Resource for Creativity: Findings from an Experimental Study on User Involvement.


Maurya, Ash. (2012). Running lean : Iterate from plan a to a plan that works (2nd ed.). USA: O'Reilly Media, Incorporated.


Appendix 1 Interview script

Warm up / general questions

- Can you tell me a little bit about yourself, what do you do for a living?
- What are your hobbies?
- Tell me about a typical day at work; what are you likely to do first thing in the morning?

Main questions (don’t forget to specify if they’re talking about D&B, trad or furniture only projects)

- Can you tell me a little bit more about your work?
- How do you match the products with the brands when we have designs but don’t have brands? Tell me about the process when you get a concept design from outside agency?
- Can you please walk me through the process (steps) you follow when you get a new client/project? Where do you get the info from? Use an example of one of your clients
- What are all the things you need to do and know in order to lead the client/project? What documents/info you need from the client to start the project?
- Suppose it were my first day as the furniture, fixtures, and equipment manager. What would it be like?
- Suppose I’m your new client. How would the process look like?
- “Can you recall a situation when you had to get an approval from the client regarding furniture list, what did you do?” Suppose the supplier delays work, what do you do?
- How often do you talk to the client?
- Why do you _____?
- Which tools do you need to use for the project?
- What’s the hardest / most frustrating part about being an account manager?
- If you had a magic wand, what would you change?
- “Please show me how you [task]“ ask them to perform the task, share their screen, etc.
- Tell me about your most significant/ memorable experience/interaction with the client?
- Would you describe what you think the ideal process of working with the client (your work) would be like?
- “What do you like/dislike about working with clients/your job”
- “What’s the hardest / most frustrating part about your job?”
- What part of your job takes most of your time?
- How do you find potential clients?
- How do you find new suppliers? If there was any other segment, what it should be from your perspective?
- Are there any projects that we skipped?
After the first interview:

Last week I interviewed people who did // said … What do you think of that idea // how do you feel about this approach
Appendix 2 Consent form

Interview Consent Form

Consent to participate in the study: Master thesis for Malardalen University

I have been given information about the study and give my consent to participate. I am aware that my participation is entirely voluntary and that I can cancel participation in the study without giving a reason for it. Through my signature, I choose to participate in the study and agree that Mälardalen University may process my personal data in accordance with applicable data protection legislation and provided information.

Signature ____________
Print Name ____________
Appendix 3 Checklist for Observation-Based Investigation

Communication:
- Inadequate communication between account manager and clients
- Lack of clear and timely communication between the furniture, fixtures, and equipment department and other internal teams
- Poor communication channels or tools hindering effective information sharing

Resource Allocation:
- Insufficient resources allocated to meet client demands and expectations
- Inefficient utilization of resources leading to delays or subpar outcomes
- Inadequate staffing levels affecting the account manager's ability to effectively handle client accounts

Process Efficiency:
- Cumbersome or time-consuming processes for client onboarding and project management
- Inefficient coordination between departments involved in the commercial furniture sales process
- Lack of standardized procedures leading to inconsistencies and errors

Technology Utilization:
- Outdated or inadequate software tools for client management and project tracking
- Limited integration between different technology systems, causing data silos and inefficiencies
- Insufficient training or support for employees to fully utilize available digital technologies

Knowledge and Expertise:
- Limited understanding of the latest trends and developments in commercial furniture sales
- Inadequate product knowledge among account managers impacting their ability to meet client needs
- Insufficient training and professional development opportunities for employees

Customer Service:
- Inconsistent or insufficient support provided to clients throughout the sales process
- Inability to effectively address and resolve client concerns or issues
- Lack of proactive engagement with clients to understand their preferences and requirements

Timeliness and Responsiveness:
- Delays in responding to client inquiries, requests, or complaints
- Inadequate follow-up and follow-through on client expectations and commitments
- Slow turnaround times for order processing, delivery, or installation

Data Management:
- Inaccurate or incomplete data recording and management, leading to errors or misunderstandings
- Lack of centralized data repository affecting access and retrieval of critical information
- Insufficient utilization of data analytics to gain insights into client preferences and trends

**Stakeholder Collaboration:**
- Lack of effective collaboration and communication between project managers and suppliers
- Challenges in managing multiple stakeholders' involvement in projects
- Insufficient coordination with end clients leading to misunderstandings or delays

**Procurement and Supply Chain Management:**
- Inconsistent supplier pricing and response times
- Delays in supply and logistics, including manufacturing and shipment issues
- Slow invoice processing and payment collection
- Manual procurement and documentation practices with outdated tools and methods

**Post-Purchase Support:**
- Issues with fit and finish of delivered furniture
- Post-delivery concerns or unsatisfaction
- Requests for changes or refunds after the order is completed
- Need for reupholstery or modifications to existing furniture
Appendix 4 List of abbreviations

- AR: Augmented Reality
- B2B: Business-to-business
- BIM: Building Information Modeling
- CAGR: Compound annual growth rate
- COVID-19: Coronavirus disease 2019
- EDI: Electronic Data Interchange
- HCD (human-centered design)
- SAP: Systems, Applications, and Products
- SRM: Supplier Relationship Management
- UAE: United Arab Emirates
- USD: United States Dollar