Enhancing Customer Experience in Furniture Retail through Full Stack E-commerce Platforms

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Abstract

Many furniture retail stores have embraced the use of online stores to sell their furniture because it has been proven to be fast, convenient, and less costly on their end. The challenge with this form of selling products is that most online platforms need to provide customers with the same experience they get when they shop at physical stores. This paper focuses on how to complete stack e-commerce platforms to offer customers this experience when they shop at online retail furniture stores. This paper focuses on how the entire stack of e-commerce applications will offer customers an improved visual representation of the furniture to know if it fits them. The platforms will also help them to visualize the furniture in their homes to enhance their customer experience. This paper focuses on the benefits of using full-stack e-commerce platforms: customer loyalty, increased sales, and, most importantly, customer satisfaction.

Keywords: full-stack, e-commerce

I. INTRODUCTION

This paper delves deeper into enhancing the customer experience in furniture retail through full-stack E-commerce platforms. Previously, the furniture retail industry mainly relied on physical stores where customers would come physically to shop for furniture. With the rise of technology, online stores were embraced. However, they had their benefits and challenges regarding the customer experience. Some of the challenges faced were limited customer care services, poor furniture visualization, and challenges regarding the delivery of furniture and assembly [1]. This paper explores how customers can have a good user experience when buying furniture from online retail stores using full-stack platforms supporting E-commerce activities.

The paper also focuses on how complete stack c-commerce platforms can solve the problems faced in traditional online stores. The platforms will use 360° view product presentation with high-quality pictures to enhance the visualization of the furniture. The complete stack platforms will employ Virtual Reality (VR) and Augmented Reality (AR), improving the customer's visual representation experience. The complete stack platforms will integrate the customers' browsing patterns, which will help them get more personalized recommendations to enhance customer satisfaction.

The paper contains successful case studies showcasing the strategies used by complete stack e-commerce platforms to enhance their customer's experience when shopping for furniture. The technical considerations for full-stack applications will also be analyzed in this paper. The paper also delves deeper into future considerations, such as using AI-powered chat boxes, which will further improve the customer experience. The effects of full-stack e-commerce platforms on traditional physical retail stores will also be analyzed.

II. CHALLENGES FACED IN ONLINE FURNITURE SHOPPING

Visualization and scale

1. **2D representation**: Most online furniture retail stores offer flat furniture representations, usually in the 2D model. Such representation needs to capture the actual measurements and texture of the furniture; therefore, the user cannot visualize how the piece of furniture will look in their living space [2].

2. **Insufficient viewing angles:** Online stores mainly offer a 180° *viewing* angle, restricting the customer's view to the backside of the furniture. This view also hinders them from fully visualizing the furniture piece in their living space.

A. Decision making

1. **Uncertainty about the quality of the furniture piece:** Customers interested in making cases in online furniture stores are usually uncertain about the quality of the furniture pieces. This is because they need to figure out the product's colour representation and texture. They are also still determining the delivery and assembly of the furniture product and if hidden costs will be incurred [2].

2. **Information overload:** Online platforms usually offer customers a lot of information about a furniture piece's description, specifications, and reviews. Reviewing all this information and seeking a

second opinion from other online stores is very tiresome and time-consuming.

III. HOW FULL STACK E-COMMERCE APPLICATIONS ENHANCE CUSTOMER EXPERIENCE

A. The use of high-quality product presentation.

1. **The use of 3D modeling tools:** The use of 3D modeling tools is essential because they offer the customer an accurate visual representation of furniture and customizations the customer can apply to the furniture piece. This tool provides the user with a 360° view of the furniture. It offers user customization tools such as changing the colour and texture of furniture to give a more detailed visualization. This feature usually provides a higher customer engagement. According to Salesforce research, 89% of customers make another purchase after receiving a good customer experience [3].
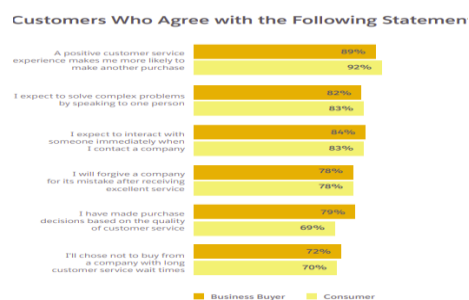

Fig 1. Salesforce Research on customer service

A. **Room planning software:** Offering the customer room planning software will ease their work when determining if the furniture piece will fit their living space and match the aesthetic they are going for. Room planning *tools* will allow the customer to plan furniture in their living space. Users can use the drag-and-drop functionality to place furniture into the room of their choice [4]. This will help the client to determine the size, color, quality, and finish of the furniture they desire, therefore making a purchase.

B. Personalized recommendations

Personalized recommendations are an excellent way of enhancing customers' user experience when purchasing software from online shops. Approximately 56% of customers are likely to shop again at the same e-commerce store because they are given personalized recommendations [5]. Collaborative filtering algorithms, matrix factorization-based

recommendations, or proposed recommendation approaches can be applied to the customer's browsing history or purchase history to determine their interests and preferences when it comes to furniture. E-commerce platforms can also use implicit and explicit data to offer customers a personalized experience.
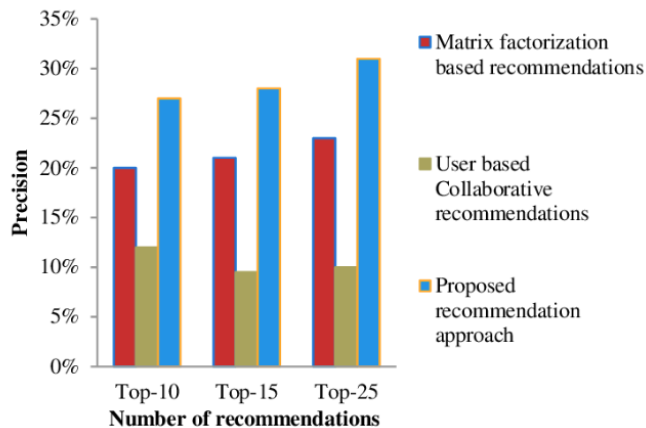

Fig 2 shows the efficiency of different recommendation algorithms

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C. Delivery and assembly management

Furniture e-commerce platforms should employ delivery tracking and communication tools. These tools are handy because they help to reduce customer anxiety. These tools allow the customer to see the delivery progress of the item they purchased and communicate with the delivery team. This enhances the customer experience because they can contact customer care with inquiries. The furniture e-commerce platforms should work with organizations that offer furniture assembly to reduce customer effort and stress. The furniture e-commerce platforms should partner with organizations with a good reputation and contain qualified professionals to provide customers with quality services.

lV. CASE STUDIES

A. Wayfair furniture store Wayfair is a furniture store that has been at the top of the market for several years, offering quality pieces worldwide. This company is based in Boston, Massachusetts, and was founded in 2002. During the 2020 financial year, Wayfair generated a net revenue of 14.1 billion dollars.

Full Year 2020 Financial Highlights

- Total net revenue of $14.1 billion increased $5.0 billion, up 55.0% year over year
- U.S. net revenue of $11.9 billion increased $4.1 billion, up 53.3% year over year
- International net revenue of $2.2 billion increased $0.9 billion, up 64.8% year over year. International segment Net Revenue Constant Currency Growth was 64.9%
- Gross profit was $4.1 billion, or 29.1% of total net revenue
- Net income was $185.0 million
- Non-GAAP Adjusted EBITDA and Adjusted EBITDA Margin were $946.9 million and 6.7% of total net revenue
- Diluted earnings per share was $1.86
- Non-GAAP Adjusted Diluted Earnings Per Share was $5.04
- Non-GAAP Free Cash Flow was $1.1 billion

Fig 3 shows Wayfair's 2020 financial statistics.

The reason why Wayfair has so many sales is that it prioritizes the customer experience. Their website has a simple and user-friendly interface, which is captivating. The website also offers various ways to log in and sign up, catering to its customers' different needs. Wayfair contains other products that can fit the customer's budget to ensure that their customers are satisfied with the products they purchase [6]. The company offers high-quality information on furniture items, such as descriptions and visuals from different angles. The website accurately measures the furniture pieces, showing their color and texture. The website offers room planning tools to help the customer with the visual representation of the item.

Wayfair offers its customers recommendations on their search engines to help users browse for their desired product. Their recommendations help users find furniture pieces that are relevant to their interests. The website also has a section for customer reviews and ratings whereby customers can look through the reviews to see if the item they want is the best fit for them. Wayfair offers accurate time delivery tracking of the item purchased by the customer by providing the customer status updates on the progress of delivery [6]. They also indicate the timeframe within which the product will be delivered. They offer their customers various delivery options, such as picking up the item from the delivery station or door-to-door delivery at a fee. The company also offers fast customer service support, which helps increase user satisfaction.

Between 2013 and 2020, Wayfair made significant progress in the number of orders it delivered throughout the years. In 2020, Wayfair delivered a total of 61 million orders worldwide. The

company is loved so much because it enhances the customer experience, gains customer loyalty, and increases sales.

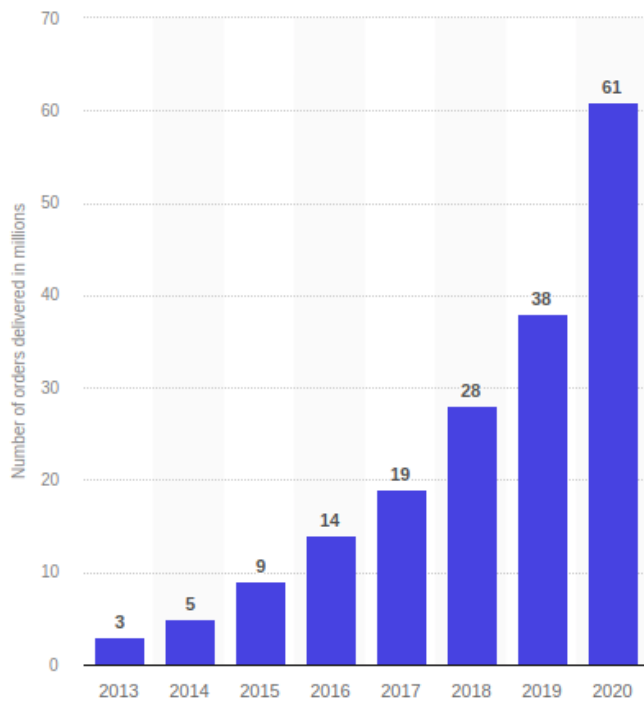## Annual number of orders delivered by Wayfair from 2013

(in millions)

Fig 4 shows the annual number of orders delivered by Mayfair between 2013 to 2020.

V. TECHNICAL CONSIDERATIONS

Building a full-stack e-commerce platform is a crucial project requiring many technical considerations to achieve the intended features.

A. Functionalities for the e-commerce store for retailing furniture

1. **Uploading high-quality images and videos:** high-quality photos and videos are essential because they help the user see if the product matches their preferences. Because e-commerce stores heavily rely on photos and videos, they must be high quality;

however, they consume a lot of storage space. In this case, AWS storage services are highly recommended because they provide vast cloud-based storage that offers a pay-as-you-go plan [7].

2. **Content Delivery Networks (CDNs):** CDNs such as Cloudflare are essential in e-commerce platforms because they *ensure* that content such as images and videos are distributed in various ways so customers can view products regardless of their physical location. It also ensures that the products load rapidly to ensure the customer has a good experience with the e-commerce platform.

3. **Product Information Management systems:** PIM systems such as Akeneo ensure that product information, such as the description and dimensions, is consistent across all the *platforms* and helps in data management. It also ensures that the product information of a furniture piece loads rapidly once the customer clicks on the item [7].

4. **3D visualization tools:** The e-commerce platform should have 3D visualization tools such as Autodesk, which will help the customers have an enhanced visualization of the product items, therefore fastening their process of looking for the dimensions and visualization of the items from other angles.

5. **Personalized search options**:

are crucial for improving the customer's experience because the information they receive will *be* based on their interests and preferences. The website should be integrated with the user's browsing and purchase history to generate the customer's search experience.

6. **API integration***:* APIs are very useful in integrating data between the backend and front end because there is fast communication between the client and server-side applications. APIs are also helpful in integrating *platforms* such as Google Maps, which will be essential in tracking customer orders. APIs will

VI. FRAMEWORKSF OR DEVELOPMENT

A. Client-side application (Front end)

The application used for the front-end side will be angular because it is easy to use and creates interactive websites that are dynamic and responsive. This framework can model the 3D visualization and offer tools such as real-time tracking of the ordered item. Angular is also efficient because it ensures code maintainability and reusability, which will help reduce the development time [8]. Angular will also be fit for developing single-page applications that provide a smooth user experience and reduce the need to reload the application.

B. Server-side application (Back end)

Java will be used for the backend development of the application because Java is efficient in handling tasks such as authentication, payment integration, and order processing. Java is very high-performance and easily scalable to meet users' needs. Java can handle all the application's business logic, like validation and data fetching. Java can be easily integrated with the MySQL database to store, search, and update customer information in the application [9].

C. Database

The database that will be the best first for this application is MySQL, which is an open-source relational database system. This database can store customer and product information. The customer information includes login details, Wishlist, cart, order history, and profile information [10]. It also ensures that the information stored is secure and safe from any data breaches.

VII. FUTURE PLANS

A. AI-powered chatbots

The e-commerce platforms will use chatbots to provide customers with personalized recommendations for furniture pieces. They are essential when answering any queries the customer might have on navigating the e-commerce platform or inquiring about more information about a product. The chatbox will enhance customer experience because it is available 24/7 to answer customers' needs.

B. Impact of E-commerce furniture platforms on Traditional physical Furniture Stores

The main impact of e-commerce stores on traditional physical stores is that e-commerce stores provide more convenience to the customer and allow them to look for the same item on different platforms and compare the prices. E-commerce platforms enable users to review product reviews to see if the furniture item is of good quality and will fit their needs.

CONCLUSION

The furniture e-commerce platforms are going through many changes aimed at improving customer experience and satisfaction through full-stack applications. These platforms are very efficient and flexible. They offer the customers convenience because they operate 24 hours a day. These platforms are very diverse in the products they have and are affordable. However, regular online stores must incorporate systems to help customers gain a good experience. To solve this problem, complete stack e-commerce applications will be used to meet the customer's satisfaction and enhance their experience by offering them tools such as 3D visualization, room planning, and real-time delivery tracking. This paper also focuses on the various tools the full-stack application ought to have to increase the customer experience. The paper also delves deeper into focusing on plans, such as integrating AI chatbots to enhance customer support.

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