Analysis and Design of Web-based Information System for Coffeeshop Management using Design Thinking Methodology: Case of *Kopi KurangLebih*

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Abstract

The traditional approach to Coffeeshop business requires business owners to manually record orders and purchase transactions, which poses serious challenges to service management in terms of effectiveness and efficiency. To optimize *Kopi KurangLebih* Coffeeshop needs and increase its appeal to consumers, a relevant management information system is required. Solving business problems requires web-based information systems that facilitate the ordering and purchasing process. In this study, we use design thinking methodology to design a system that meets user needs. *Kopi KurangLebih* users are buyers, stakeholders, customers, baristas and cashiers. The *Kopi KurangLebih* website has several advantages, including viewing menus and ratings, food and drink selections, promotions of the day, points redeemable for various user benefits, and other facilities within the cafe. Therefore, *Kopi KurangLebih* can make information readily available to purchasers and potential purchasers to increase its attractiveness and marketability. The results of this study show that Coffeeshop management system design supports Coffeeshop management processes more efficiently and effectively compared to traditional business processes. Nonetheless, the role of each actor in performing their respective tasks optimally becomes a determinant of business losses and gains.

Keywords: Coffeeshop; Design Thinking; Website; *Kopi KurangLebih*; BSD

1. INTRODUCTION

Coffeeshops, or what we know today as cafés, are also experiencing increased trends and public interest [1]. Therefore, the initiative to design an information system for Coffeeshops begin. *Kopi KurangLebih* already has social media on Instagram to display content as information for followers. Still, clear communication is limited to going through the follower's home page and should be more structured and orderly. Visitors struggle with choice when choosing a menu. Therefore, we need a container to document and communicate information that helps customers make menu choices and improve service quality. [2] The

content that appears on social media as a Coffeeshop source is poorly documented and inefficiently distributed. This is because information uploads to social media are temporary and only visible on your timeline. The manager needs a system that collects all the data in one place and gives customers easy access to reports. This indicates that the development of *Kopi KurangLebih* requires a system to record and display data in a structured, exciting, and informative way. Therefore, we know that the development concept of *Kopi KurangLebih* should be adapted to the needs of users and the resources of *Kopi KurangLebih* itself.

Kopi KurangLebih's surveys should be designed and developed to make information readily available to potential customers, increasing customer enthusiasm and purchasing power. A multimedia-based information system displaying menus helps guests decide which menu to purchase [3]. Product information such as menus, prices, and reviews allow the website to receive feedback such as criticisms, suggestions, and customer testimonials to help us improve our services and maintain quality [4]. This shows that *Kopi KurangLebih* can be designed by considering what needs to be enhanced and meeting users' needs. Therefore, the decisive factors for the functioning of the features included in the system depend on the evaluation of *Kopi KurangLebih* and the analysis of user needs.

By utilizing digital information media in the form of a website as a forum to promote, store, and provide information, potential customers become more facilitated and increase trust and buying interest. Then, of course, the website to be designed must also be of high quality and attract attention in terms of the user interface, user experience, and user benefits obtained when accessing and becoming customers. The website layout design affects consumers' attitudes toward the website and involves buying interest [5]. In addition, with the discount and points feature for users as a Customer Relationship Management (CRM) strategy can be effective to increase customer satisfaction and loyalty for repeat purchases [6]. Using digital marketing through the *Kopi KurangLebih* website will attract more buyers while gaining customer loyalty [7]. Thus, the *Kopi KurangLebih* website needs to be designed by paying attention to various aspects ranging from design to features to get customers' commitment so that *Kopi KurangLebih*'s marketing can sustainably occur.

The essential thing *Kopi KurangLebih* designed is to participate in building and developing one of the local Coffeeshop brands, namely *Kopi KurangLebih*, by providing digital information in the form of a website. Many local Coffeeshop brands can be found in the capital and surrounding areas. However, we chose *Kopi KurangLebih* because Coffeeshops have potential and could still be developed. This is an opportunity for both BSD Coffee and the campus. On the Coffeeshop side, it can increase sales, brand equity, and customer loyalty. In addition, the campus also has the advantage of being a valuable place to rest, work on assignments, and chat at a Coffeeshop after coming home from campus. Therefore, *Kopi*

KurangLebih's design is more user-friendly for potential consumers, finding ideas for a website-based platform that can support the development of cafes and positively impact multiple stakeholders in the region.

Development and research on the analysis and design of Coffeeshop information systems are more relevant to the needs of the customer and the Coffeeshop itself, thus providing a solution-oriented approach to problem-solving and requiring human-centered methods [8]. The Design Thinking stage can be used as a framework for designing the *Kopi KurangLebih*. Design thinking is a method of bringing together many ideas to develop a solution in a user-centered approach that meets the needs of system design [9]. The benefit of this design thinking method is a series of strategic and practical processes that can be used repeatedly to understand user needs when solving problems and creating innovative solutions [10]. This shows that design thinking is an option due to its advantages and stages in system design. Therefore, *Kopi KurangLebih* uses the Design Thinking methodology as the system design framework for BSD Less Coffee.

The design of *Kopi KurangLebih* is expected to help the Coffeeshop develop and improve performance to attract more consumers by displaying attractive and user-friendly website designs, presenting features that provide information for consumers, and innovating ways to get loyalty from customers. Supported by the strategic location of the Coffeeshop further allows it to contribute to helping the Coffeeshop in attracting more consumers and customers. Furthermore, the Coffeeshop can cooperate with the nearest agencies through promos. The *Kopi KurangLebih* website allows managers of coffeeshop to develop and equate steps with other Coffeeshops and get more consumers with the various features presented. Therefore, the design of the Coffeeshop can play a role in developing and improving coffee management performance.

2. METHOD

Kopi KurangLebih system is design based on the flow in the HCD (Human Centered Design) implementation method, namely design thinking. The design thinking method has several stages: first, emphasize; second, define; third, ideate; fourth, prototype; fifth, testing [11]. At the emphasize stage, it can be done by going directly into the field and communicating with consumers, or it can also act as if we are consumers themselves [12]. Then, at the define stage, the root of the problem can be determined, which is the user's needs. Furthermore, at the ideate stage, all suggestions, criticisms, and consumer responses will be used as ideas and solutions to answer user needs [13]. Then the pictures will be compiled to design the initial *Kopi KurangLebih* system. This shows that system designers can collect data through questionnaires, interviews, and focus group discussions and then triangulate data to draw common threads of user needs. Thus, the design thinking

method is used to identify user needs in designing *Kopi KurangLebih* as a website. The design thinking method in question can be seen in figure 1 below.
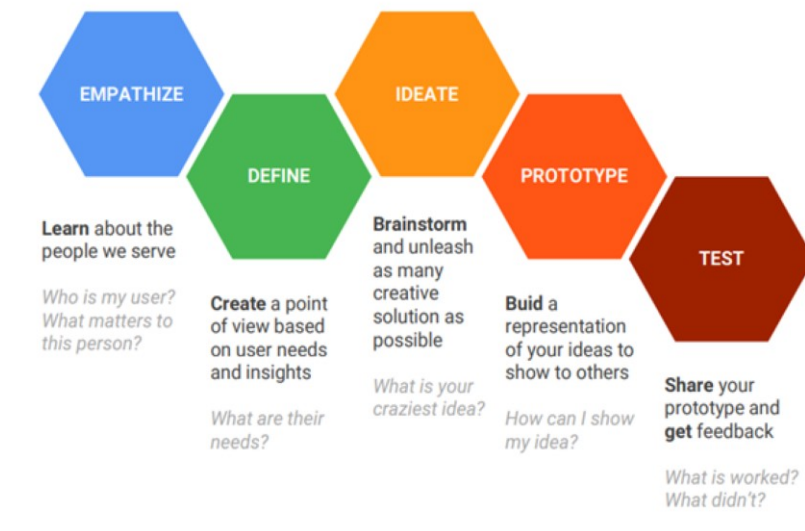

Figure 1. Stages of *design thinking* methods

Figure 1 is a design thinking method consisting of empathize, *define*, *ideate*, *prototype*, and *testing* stages. However, this study has limitations on the scope of discussion. The focus of the *Kopi KurangLebih* design stage is limited to the location of designing the system and the appearance of the user *interface*, which at the scene in this *design thinking* method will only reach the *prototype* stage. The main focus of user needs research as well as system design and user interface design *Kopi KurangLebih* has several considerations, including: first, the process of collecting data regarding user needs is taken through two sides, both from the consumer side and from the *Kopi KurangLebih* itself in the hope of answering the needs of both parties; Second, a more profound emphasis from the customer side through focus group discussions to find out the preferences of the majority while getting direct advice. This shows that the design of *Kopi KurangLebih* requires thorough research in analyzing user needs and designing the system. Thus, the main focus of this research discussion is the design of *Kopi KurangLebih* using the Design Thinking framework, where the process of analyzing the needs of *Kopi KurangLebih* users has a flow like the following figure 2.
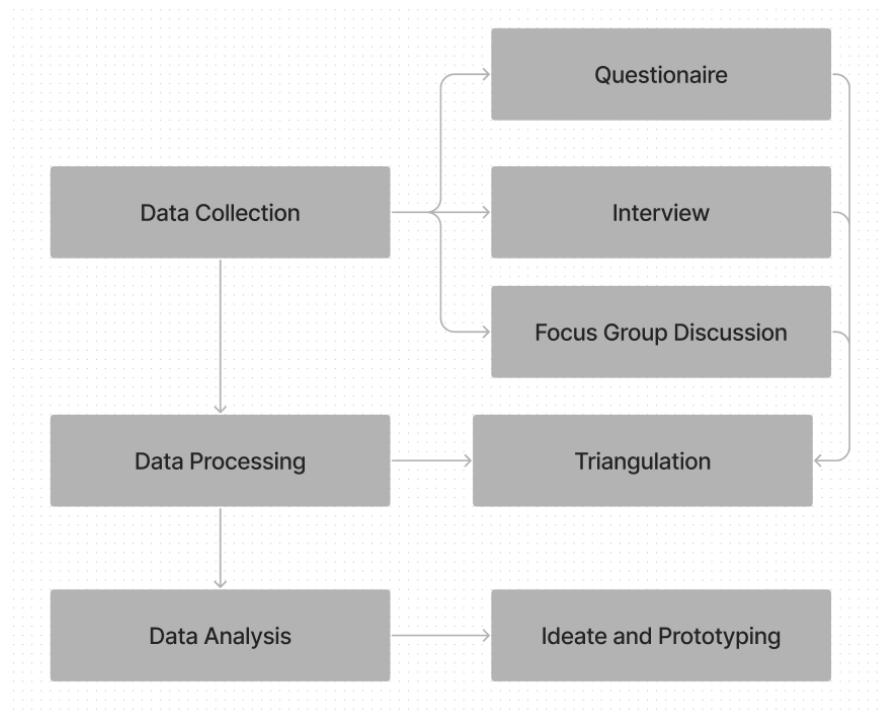
Figure 2. User Requirement Process

Figure 2 is a flow of analysis of user needs of the *Kopi KurangLebih* system, which starts from data collection using three methods, namely: dissemination of questionnaires both to people who have or have never come to *Kopi KurangLebih*; *interviews* directly or indirectly to the *Kopi KurangLebih* customers and people who are active around the area; as well as conducting *focus group discussions* with participants taken from the results of the distribution of questionnaires with specific criteria. From the results of these three methods, data triangulation will be carried out, and the common thread can be drawn so that it can be found what is needed by the *Kopi KurangLebih* system. The three data collection methods and the criteria are able to define, ideate, and prototype the system include determine the roles and needs of actors, strategies, displays, content, and features that *Kopi KurangLebih* will work on.

Triangulation is a crucial technique in the design thinking method when it comes to data processing. By using multiple sources of data, such as customer feedback, observational studies, and sales data, triangulation helps to provide a more accurate and comprehensive understanding of the problem at hand [14]. In the case of *Kopi Kurang Lebih* Coffeeshop, triangulation was used to analyze customer behavior and preferences, as well as to identify pain points and areas for improvement. By combining data from various sources, the Coffeeshop was able

to gain a holistic view of its customers and their needs, which allowed them to develop more effective solutions to improve the customer experience. Triangulation also helps to ensure the validity and reliability of the data, as it minimizes the potential biases that may arise from relying on a single source of information. Overall, triangulation is a valuable tool in the design thinking process, as it allows for a more accurate and thorough understanding of the problem, leading to more effective and targeted solutions.

After implementing design thinking and prototyping, *Kopi Kurang Lebih* Coffeeshop has seen significant improvements in its customer experience and overall operations. The design thinking process helped the Coffeeshop identify its customers` pain points and needs, leading to the creation of more personalized and meaningful experiences [15]. By prototyping various solutions, the Coffeeshop was able to test and iterate on different ideas, resulting in more efficient and effective processes, such as a streamlined ordering system and a more welcoming interior design. Additionally, the Coffeeshop was able to create a stronger brand identity, resulting in increased customer loyalty and positive word-of-mouth recommendations. Overall, the use of design thinking and prototyping has been instrumental in helping *Kopi Kurang Lebih* Coffeeshop deliver a better customer experience and stay competitive in the market.

Testing prototyping in the design thinking method proved to be a valuable tool for *Kopi Kurang Lebih* Coffeeshop, as it helped to identify potential flaws and areas for improvement before implementing the final solution. By testing the prototype with a small group of customers, the Coffeeshop was able to gather valuable feedback, which they used to refine and improve their solution [13]. This iterative process allowed the Coffeeshop to develop a solution that was tailored to their customers' needs and preferences, resulting in a more satisfying customer experience. Testing the prototype also helped to identify potential issues with implementation, such as operational challenges or technical difficulties, which the Coffeeshop was able to address before rolling out the final solution. Overall, testing prototyping was an effective method for the Coffeeshop to refine their ideas, gather valuable feedback, and ensure a successful implementation of their solution.

3.   RESULT AND DISSCUSION

Coffeeshop websites are becoming increasingly crucial for coffee lovers who want to explore new Coffeeshops, buy products online, and learn more about their favorite coffee roasters. With the demand for specialty coffee growing and online shopping booming, a well-designed Coffeeshop's website can provide a valuable platform for businesses to showcase their products and services. An easy-to-navigate, visually appealing, and informative website is essential for any Coffeeshop trying to attract and retain customers. The website becomes the first

point of contact for potential customers. An excellent first impression can make all the difference. In summary, having a Coffeeshop website in today's digital age cannot be overstated. It can significantly enhance your business's online presence and increase sales.

Managing a Coffeeshop website presents several challenges. One of the main challenges is keeping the site up-to-date and relevant, especially with the rapidly changing trends in the coffee industry. Maintaining an active blog section, updating menus, and introducing new products are some of the tasks that require regular attention. Additionally, managing online orders and fulfilling customer requests can be time-consuming and overwhelming for small business owners. Overcoming these challenges requires a strategic approach prioritizing consistent, high-quality content creation, efficient inventory management, and seamless customer service. Managing a Coffeeshop website can be difficult, but investing in an online presence is critical for businesses to remain competitive in today's digital environment.

Based on the challenges of developing a Coffeeshop, this research tries to design a website to support business management and marketing. Based on the design thinking approach, the initial design stage is the empathy stage at the scene of collecting the needs of the first activity that needs to be carried out, namely the analysis of the business process of *Kopi KurangLebih*. After knowing the business processes carried out, identify user and system needs. Two main business processes are carried out, namely sales and purchases. Within these two processes, there is a transaction. The business process *Kopi Kurang Lebih* can be shown in Figure 3.
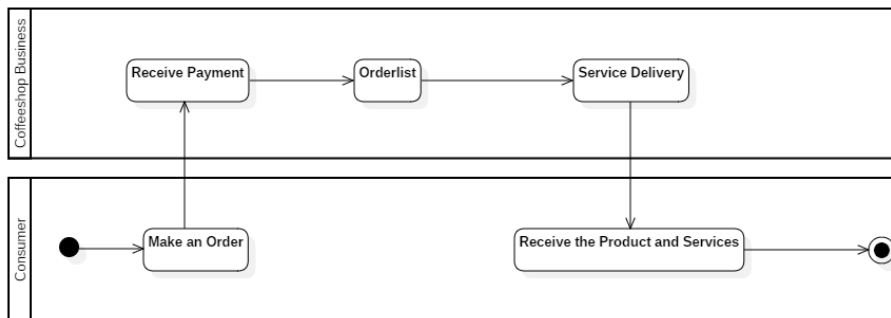
Gambar 3. Coffeeshop Business Process

Figure 3 is a business process from *Kopi KurangLebih* that is adjusted to the purchase behavior where the buyer places an order. The seller receives payment for the order, makes drinks according to the order, and serves the drinks; then, the

buyer takes the order. Seller-buyer interactions in Coffeeshops are critical to creating a positive customer experience. From the moment a customer walks into a Coffeeshop, the exchanges between seller and buyer can set the mood for the entire visit. Friendly and attentive staff can make customers feel welcomed and valued, but an indifferent or unhelpful attitude can lead to frustration and dissatisfaction. Coffeeshops prioritizing customer service and connecting with customers are more likely to build a loyal customer base and nurture a positive reputation. In summary, seller-buyer interactions are critical to the success of Coffeeshops, and companies that invest in customer service are rewarded with increased customer retention and satisfaction.

A Coffeeshop website can offer several advantages for internal management. Coffeeshops can streamline operations and improve efficiency by providing a centralized inventory management, staffing, and sales reporting platform. A well-designed Coffeeshop website can also help businesses manage customer relationships, track buying habits, and make informed product offerings and promotions decisions. Investing in a robust Coffeeshop website is essential for companies looking to streamline internal controls and improve profitability. In summary, a Coffeeshop website can be a powerful internal management tool, providing companies with valuable insights and tools to streamline operations and enhance customer relationships.

This use-case diagram has six actors: prospective buyers, buyers, customers, admins, cashiers, and baristas. Prospective buyers register an account to have an account and be able to transact at *Kopi KurangLebih*. The admin is in charge of verifying the data of potential buyers and storing the data of potential buyers. Potential buyers can see the menu and consult the menu, so they can decide whether they want to buy or not. If you want to buy, the buyer can place an order if the customer can immediately reorder (repeat order); after that can make a payment. The cashier will verify the order. The cashier will also give points and vouchers to customers. The ruling comes in and will be given to the barista. Buyers or Customers can wait by being given a queue number and barcode. The barista will call the queue number.

The use case diagram is an essential tool in design thinking for the *Kopi Kurang Lebih* website. This diagram provides a visual representation of the various user interactions and scenarios that the website must support. By creating a use case diagram, the design team can gain a better understanding of the user's needs and requirements, which can inform the development of a more effective and user-friendly website. Through the use case diagram, the design team can identify the key features and functionalities that are necessary for the website to provide a positive user experience. This diagram can also help the team to prioritize features based on their importance to the user, which can guide the development process and ensure that the website meets the user's needs. In addition, the use case

diagram can be used as a communication tool to facilitate collaboration between the design team and stakeholders, such as business owners and developers. Figure 4 shows the Usecase Diagram from *Kopi KurangLebih*.
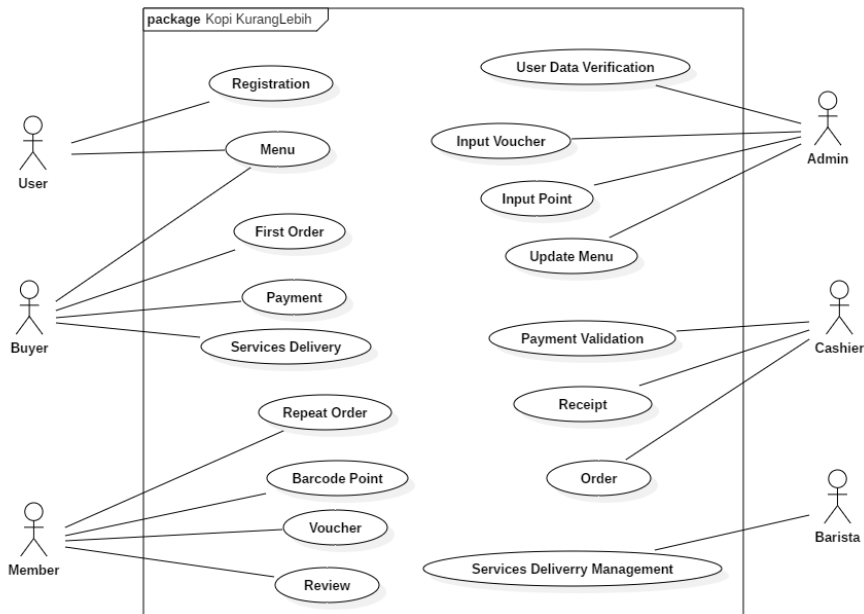

Figure 4. *Kopi KurangLebih* Usecase Diagram

Figure 4 shows that each actor has its function, as follows: prospective buyers can register an account and view the menu; buyers can view menus, consult menus, order food or drinks, make payments, and take orders; customers, repeat orders, scan barcodes to earn points, choose vouchers as customers, and leave reviews for products that have been ordered; administrators, verifying and managing customer data, including menu data; cashier, can verify payments and take orders; barista, make an order. Each actor has an important role and needs to be accommodated in the information system.

The roles of buyers and members of the Coffeeshop management system are critical to the Coffeeshop's success. The buyer is responsible for selecting and purchasing quality coffee beans, equipment, and other consumables necessary to operate the business. On the other hand, the management team is responsible for overseeing the cafe's daily operations, managing staff, creating and managing budgets, and developing marketing strategies. One key point is that the roles of the buyer and management team are interdependent, as the success of one directly affects the success of the other. Effective communication and collaboration between the two roles lead to better decisions, improved customer service, and

increased profitability. The buyer and management team are critical to any Coffeeshop's success. Companies prioritizing collaboration and effective communication between these roles are more likely to succeed in a competitive marketplace. In addition, the activity diagram below is the process of flowing actors in running their business processes. This process shows from the beginning of the prospective buyer registration until the customer runs the *Kopi KurangLebih* website. For more details, it can be seen in figure 5.
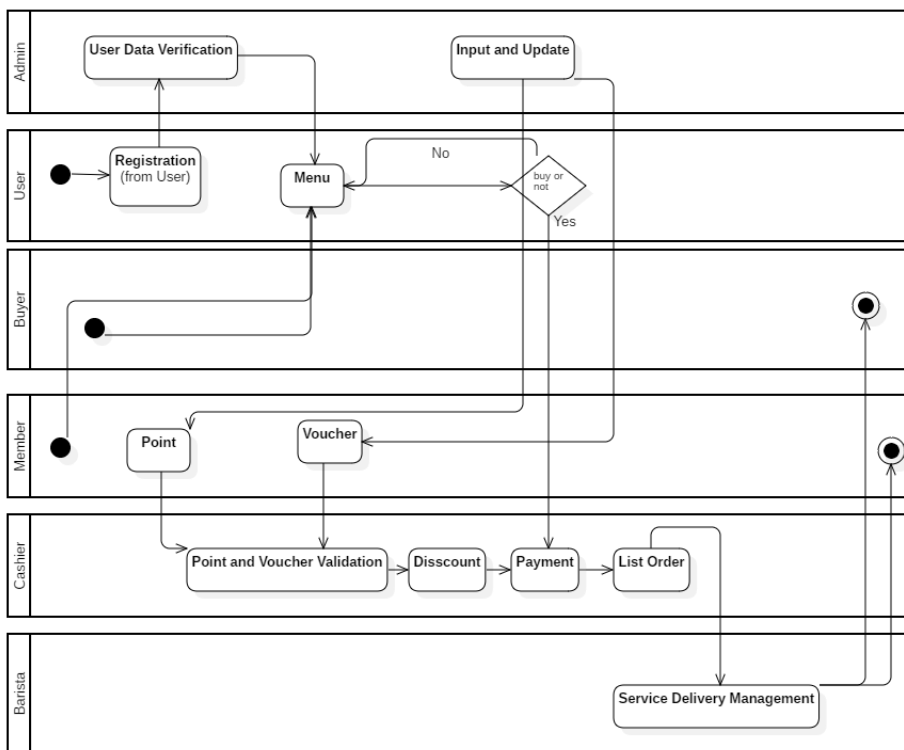

Figure 5. *Kopi KurangLebih* Activity Diagram

Figure 5 is an activity diagram from *Kopi KurangLebih*. Based on the activity diagram, it can be understood that the flow of the *Kopi KurangLebih* as a whole, starting from prospective buyers when registering, admins verifying data, and saving data; buyers can see the menu to proceed to the order stage, if the menu is not suitable, you can reorder as a member to use purchase vouchers. Next, the buyer makes a payment to the cashier. The cashier verifies the payment and gives points to the customer. The cashier receives the purchase in the form of transaction data and then handed over to the barista to process the food and drinks ordered by the buyer; when it is ready, the buyer can take the order.

Activity diagrams are useful tools for visualizing the flow of activities and processes in the information systems management of a Coffeeshop. They provide a clear and concise representation of how various activities are related, allowing an organization to identify potential bottlenecks and areas for improvement. For example, you can use an activity diagram to represent taking and fulfilling customer orders, from selecting and sizing beverages to preparing and serving them. By analyzing activity graphs, Coffeeshop owners and managers can identify potential inefficiencies, such as long wait times and bottlenecks in the order fulfillment process, and implement solutions to improve customer satisfaction and profitability. It can be improved. One finding is that activity diagrams can also identify opportunities for automation or optimization, such as using digital ordering or merchandise management systems. In summary, activity diagrams are valuable for understanding and improving the flow of activities and processes in Coffeeshop information system management. This allows businesses to streamline operations and deliver a better customer experience.

Design thinking is a human-centered approach to problem-solving that emphasizes empathy, collaboration, and creativity. Applying design thinking principles to developing an activity diagram for a Coffeeshop`s information system management can help businesses identify and address customer needs more effectively. By understanding customers` needs and pain points, companies can create a more streamlined and user-friendly system that enhances the customer experience. Moreover, design thinking encourages a collaborative and iterative approach to problem-solving, allowing firms to test and refine different solutions to improve the system quickly. An insight is that the use of design thinking in combination with activity diagrams can lead to a more effective and innovative information system management for Coffeeshops, helping to differentiate them from competitors and enhance their customer relationships. In conclusion, using design thinking in developing an activity diagram for a Coffeeshop`s information system management can provide businesses with valuable insights into customer needs and preferences, enabling them to create more effective and customer-centric solutions.

The class diagram is an important tool in design thinking for the Kopi Kurang Lebih website. This diagram provides a high-level view of the various classes and objects that are used within the system, including their attributes and relationships. By creating a class diagram, the design team can gain a better understanding of the underlying structure of the website, which can inform the development of a more organized and maintainable codebase. Through the class diagram, the design team can identify the key entities and relationships that are necessary for the website to function properly. This diagram can also help the team to identify areas where modularity and abstraction can be applied to improve the maintainability and scalability of the codebase. In addition, the class diagram can be used as a

communication tool to facilitate collaboration between the design team and developers, as it provides a clear and concise overview of the system's structure and organization. Figure 6 shows the Class Diagram from *Kopi KurangLebih*.
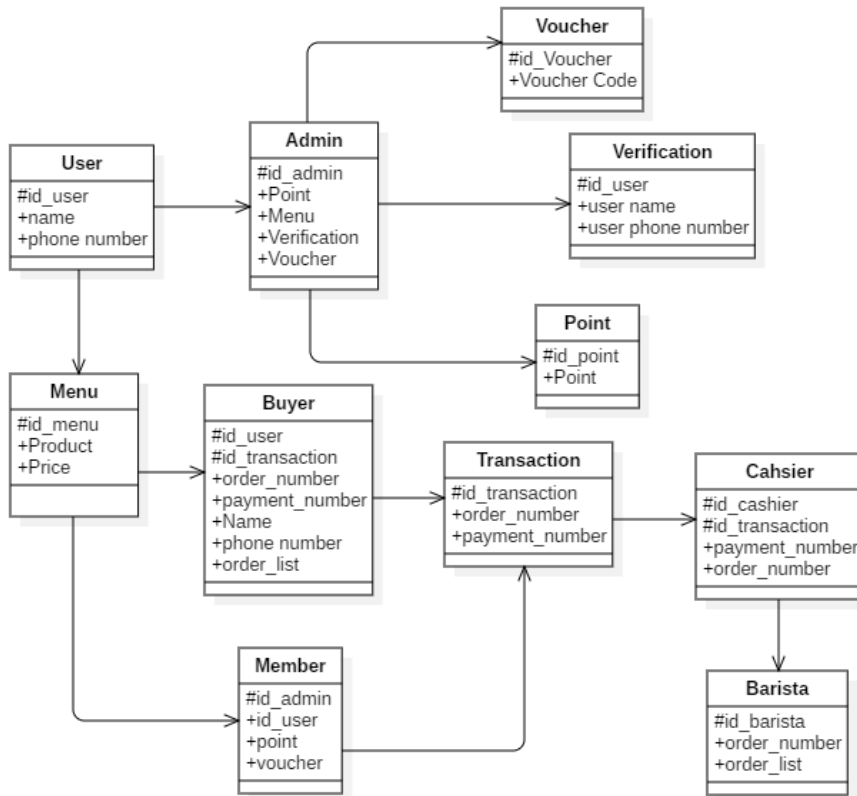

Figure 6. *Kopi KurangLebih* Class Diagram

Figure 6 shows that data is needed in the *Kopi KurangLebih* design. Class diagrams are essential for describing the roles and relationships between various actors in a system: cafe managers, buyers, and sellers. Coffeeshop administrators are responsible for managing the entire operations of Coffeeshop, including setting up the website, managing inventory, and supervising staff. The Buyer is responsible for selecting and purchasing quality coffee beans, equipment, and other supplies necessary to run the business. The Seller is responsible for interacting with customers, preparing and serving drinks, fulfilling orders, and managing. Class diagrams visually represent how these different roles interact and help identify potential areas for improvement and optimization. In summary, class diagrams are a valuable tool for describing the functions and relationships between

various actors within a Coffeeshop, helping companies streamline their operations and provide a better customer experience.

The relationship between Coffeeshop managers and employees is critical to creating an effective and productive work environment. Managers oversee the cafe's day-to-day operations, manage staff, and ensure customer satisfaction, while clerks interact directly with customers, prepare and serve drinks, and work orders. Effective communication and collaboration between the two roles lead to better decisions, improved customer service, and increased profitability. One key takeaway is that a positive, collaborative relationship between managers and salespeople creates a positive work culture, increases employee satisfaction, and helps reduce turnover. In summary, the relationship between managers and salespeople is critical to Coffeeshop success. Companies prioritizing collaboration and effective communication between these roles are more likely to succeed in a competitive marketplace.
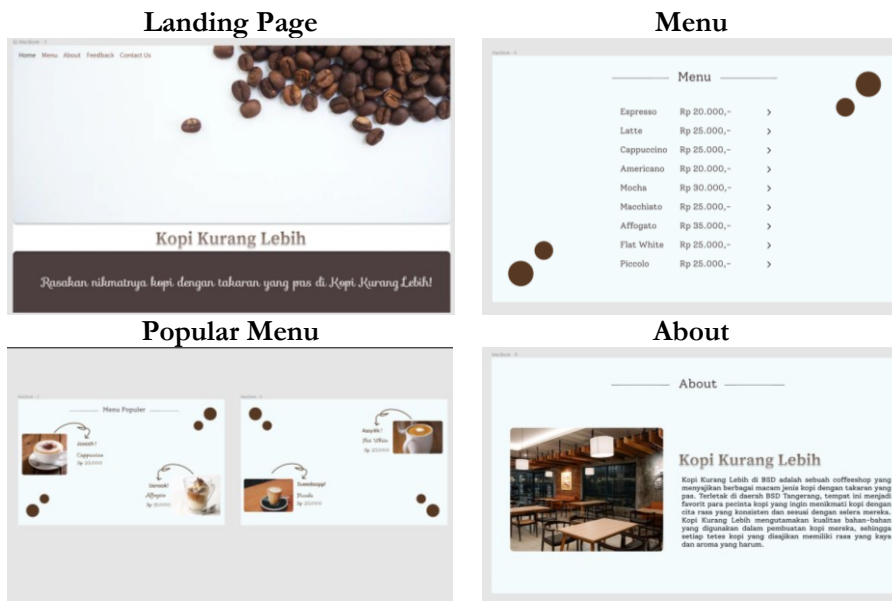

Figure 6. Prototype of *Kopi KurangLebih* Website

Figure 6 is a prototype of *Kopi Approximately* BSD which is adapted to the menu with the dine-in concept. The display is designed to be as simple as possible, so as to create a calm and relaxed impression for customers. Likewise, the price of the product is displayed to convince customers that the drinks sold are very affordable. Meanwhile, the popular menu is displayed to be a clue for each first-time individual regarding the drinks most often ordered by *Coffee More or less customers*. Designing

an effective information system management for a Coffeeshop can significantly contribute to the business's success. An efficient system can streamline operations, simplify decision-making, and improve customer service.

For instance, implementing a digital point-of-sale system can make transactions faster and more accurate, while an inventory management system can help to prevent stockouts and waste. Furthermore, designing an information system management that integrates with a Coffeeshop`s website can provide customers with a seamless experience, from browsing the menu to placing orders and making payments. An insight is that efficient information system management can help a Coffeeshop compete more effectively in a crowded market and provide a better experience for both customers and employees. In conclusion, designing an effective information system management can significantly contribute to a Coffeeshop`s success, providing businesses with valuable insights and tools to streamline operations and enhance customer relationships.

4. CONCLUSION

The results of this study show that the system design for website-based Coffeeshop management is more efficient and effective in helping the coffee business management process compared to conventional business processes. Nevertheless, the role of each actor to be optimal in their respective duties becomes a determining factor for business losses and profits. Meanwhile, the Coffeeshop management information system is limited to functional aspects and cannot control non-functional facets related to customer emotions or feelings. Therefore, the role of all parties, both business owners and business managers, is needed to provide the best service for consumers. Thus, the Coffee management information system are able to support business sustainability and the economy in the operational business area.

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