

# ***SHOP BUDDY***

## ***Enhanced Automated Chatbot for Any E-commerce Website with Data Analytics Functionalities***

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### **Abstract**

Online retail business like Shopee, Zalora, and Lazada are established in a technological environment of mobile applications. Thus, all their components are heavily integrated with technology. However, there is one area that needs to be improved which is the after sales or the customer service. The project focuses on designing an enhanced automated chatbot for any e-commerce website. The idea revolves around the thought of having a smoother online shopping experience for both customers and sellers. The proposed automated chatbot shall also be the means to implement a data analytics dashboard for the website administrators to monitor, manipulate and visualize the occurring concerns and issues faced by customers. The chatbot shall lean towards the customers and user's preferences on the designs, functionality, and product of the project. The researchers proposed the e-Commerce customer service chatbot to be named as Shop Buddy to appeal to the public. The overall project shall provide a better shopping experience for customers and user's alike as e-Commerce is the present, and future of the business industry.

### **Keywords**

Automation, e-Commerce, Customer Service, Chatbot, Data Analytics

## **1. Introduction**

The modern world relies heavily on technology and its application. Different industries like logistics, education, health, retail, and so much more have already integrated technology. In the applications of technology in the business industry, innovation is almost always the initial process. Innovation plays a big role in business and technology and as technology provides a variety of opportunity to improve a business and its processes, the business can fully utilize the technical advantages brought upon by technology.

e-Commerce platforms like Shopee, Zalora, and Lazada are some of the most common online retail mobile applications in the Philippines and users from all demo-graphs are familiar with their features and brands. Other types of e-Commerce platforms like Alibaba, AliExpress, Amazon and eBay are also on the rise which caters to different customers. All e-Commerce platforms feature components that are heavily integrated with technology. However, one such area of the e-Commerce that has been neglected: the customer service. Upon using the applications above, it is beyond noticeable that the customer service lacks automation and often serves as a liability for the online purchasing experience.

### **1.1 Objectives**

The researchers intend to follow the following objectives regarding the use of chatbots in customer service for e-commerce websites.

- To design a chatbot that will be able to handle customer engagement while also able to present collected data from these interactions into useful data analytics.

## 1.2 Current State

Every e-commerce has their own ways of communicating with their customers. Some have their own chatbots and others personally respond to their customers' concerns. The chatbots that every e-commerce companies were usually designed to provide customer support or service, to suggest products to their customers, and to complete the purchases of their customers. But some of the replies of the chatbots does not relate or it does not have a connection with the concerns of the customers. Also, some e-commerce businesses offer automated chat which lets the sellers or the owners of the business to engage more customers or update their customers by sending an automated message and to provide instant replies to their customers. Example of an automated messages is when you browse to their shop and you did not add some of their products to your cart, the customer will receive a browse abandonment message, sometimes it includes promo codes or discounts to let customers revisit and purchase their shop. Another example is when the customer ordered to the shop, the customer will receive an automated order confirmation message.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• User friendly</li> <li>• Available 24/7</li> <li>• Less operational costs</li> <li>• Customizable replies</li> <li>• Personalized recommendations</li> <li>• Instant response</li> </ul>	<ul style="list-style-type: none"> <li>• High initial cost</li> <li>• Inaccurate response</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Users can ask any questions, freely.</li> <li>• Use data analytics to analyze the concerns and complaints of the users.</li> </ul>	<ul style="list-style-type: none"> <li>• Unclear messages</li> <li>• Changes of customer's expectations</li> <li>• Continuous improvements</li> </ul>

Table 1. SWOT Analytics

### Strengths

As seen on Table 1, one of the strengths of having chatbots is that it is user friendly since it can automate conversations and it reduces that waiting time of the customers for the response of the business owners. It is also 24/7 available as a customer service that improves the customer experience to the shop. Another strength is having less operational costs since it reduces the volume of phone calls and the duration of every calls and reducing labors. Having chatbots can also help the business promote the business since it can be personalized and could create instant replies to the users.

### Weaknesses

One of the weaknesses of having chatbots is that it is not always accurate since the user's concerns may not have a clear scope of the topics or it is too broad that the chatbot cannot answer it since it only includes the common questions or concerns that the customers ask. Another would be high initial costs, but this depends on the features of the chatbots which was elaborated on Table 1.

### Opportunities

One of the opportunities is that the users have the freedom to asks questions regarding their concerns. Another would be using data analytics to analyze what are the main concerns and complaints of the users or

customers that the business could identify which should they focus on. Based on Table 1, having data analytics could reduce costs since it gives awareness to the business owners on which products gives more profit or which is more profitable, and they could focus with that than wasting budget on those products that are not profitable and it could help identify what are the issues that the customers experience to their products and services, it that way the business owners can also focus on their improvements regarding their products and services to satisfy the customer's needs. It also helps show the current trends.

#### Threats

As seen on Table 1, one of the threats of having chatbots is that the chatbot does not have all the scope of every concerns of the customers which results on having unclear replies. Another would be the sudden changes of customer's expectations since customers expects more and is increasing all the time. It can be based on the customer's previous experiences or experiences to other products and services and the users have more options or choices than ever.

### 1.3 Opportunities for Studies

Customer service is an integral component of a business, especially for the e-Commerce industry. The e-Commerce industry is one of the many industries that has the most interactions with sellers and consumers, thus having a reliable customer service proves to be an essential factor for the business. The Table 2 shows the breakdown of the opportunities and areas for improvement that the Buddy Shop can utilize.

Objective	Current State	Desired State	Gap Identification	Gap Description	Recommended Action
<b>To design a chatbot that will be able to handle customer engagement while also able to present collected data from these interactions into useful data analytics</b>	There are a wide range of customer service features that e-Commerce applications utilize	To have a revamped automated chatbot that can produce data that can easily be integrated into data analytics	Yes	In comparing other e-Commerce applications' customer service features, there, is an obvious reliant to human functions which may/may not be used for data analytics	Design an e-Commerce website with a chatbot that automatically sorts and records conversations for data manipulation data analytics

Table 2. Gap Analysis

## 2. Literature Review

The Design of Chatbots for E-Commerce websites directly relates to one of the sustainable development goals published by the United Nations (2016). Out of the 17 SDGs that the United Nations have published, the 9th SDG entitled as "Industries, Innovation and Infrastructure" is one of the many inspirations for the development of the project. According to the United Nations (2016), under the goal 9.B to 9.C which hopes that the innovation of the application of technology and development of research based technological innovation would eventually accommodate the industrial sectors of different countries and support the development of the information and communications sectors.

E-commerce has developed significantly along with the rapid expansion of the Internet. To meet increasing customer demands due to more and more people preferring digitalization of physical stores,

companies continue to establish further contact mediums so that a comprehensive range of services can be ensured. Aside from competing which among the companies have better products, companies also compete over who has the best service to make a distinction of themselves. As such, service is also becomingly an increasingly important success factor for companies. Companies aim to reduce the cost of customer service without reducing its quality.

### **2.1 Customer Service Experience**

The assimilation of emerging new technologies is pointing out to a demand of creating a well-perceived customer experience. Organizations nowadays are starting to make it their main goal of creating a very satisfying customer service to create loyalty amongst them. Customer Service Experience has received increasing amount of attention and even more so during this time of the pandemic where physical interaction is limited due to the threat of contracting the COVID 19 virus from one's peers. They play a very vital role in an organization's ability to generate income and revenue (Cui, Lei, et al, 2017). Companies spend a rather significant number of resources to maintain positive reception of their brand to make sure their relationship with their customers goes smooth and without any hurdles. Companies also nowadays are intent on focusing on customer loyalty and gaining competitive advantage over their competitors by creating favorable and very positive experience for their customers (Badgett et al., 2007). Building up their reputation by focusing on controllable online customer experience factors such as searching, browsing, selecting, comparing, evaluating and their experiences with regards to their interaction to the online sellers themselves are what the e-commerce business strive to maintain every year. Studies have found out that customer experience plays a huge role in enforcing positive attitudes and customer behavior (Demangeot and Broderick, 2006). Digging deep into customer experience on online channels has been of increasing importance to both business and the academia alike (Verhoef et al., 2009).

Online shopping and E-commerce have made a huge impact regarding the face of the retail industry (Klaus, 2013). Known figures such as Amazon, Lazada and Shopee continue to dominate the market while conducting its business to its customers almost exclusively via the Internet. Subsequently, in order to maintain their good relationship with the customers many e-commerce businesses are currently increasing their efforts to improve their online service quality most notable the online customer service experience. Despite this, some companies like Lazada are performing rather poorly with regards to their customer service performance. Linh, H. H. V. (2020) states that in the recent report of Lazada, The Lazmall customer service team has achieved lower customer satisfaction than target, which goes against expectation of the management team in the company to provide extraordinary experience to all customers who buy products on their platform.

Customer support in an organization spends a lot of time in answering queries made by the customers in order to make sure these customers are satisfied with their business and make sure that the reception that they gave will warrant another transaction from them thus building up a good customer and business relationship. However, these queries, which are often very repetitive, may take up a lot of resources and support staff that they may not be available in case a higher value query has been made. The manpower needed to operate these activities can be made more effectively and cost-effective if it is automated and done by something like an Artificial Intelligence app that can lighten the load of the support staff which can pave the way in case a high value query come out into the open.

### **2.2 Alternative Approach for a Faster Enquiry Handling Process in the e-Commerce**

AI or Artificial Intelligence refers to a simulation of human intelligence design to think and act like humans. It enables them to a certain degree, do specific and repetitive task much faster and more effective than humans. Since the dawn of a new modernized era, A.I. has played a huge role in innovating current systems and technologies to better suit the needs of different businesses and industries. One such field to be specific is the customer service area of businesses. According to Gnewuch, U. (2017), hypothesizing about different artificial intelligence-based conversational agents in the field of customer service had already been touched upon as early as 2013. Developers hope that the implementation of conversational agents could create a convenient and cost-effective means of communicating with customers. Although it was seen as an impossibility with the current advancements of technology, guidelines and discussions hope to establish an A.I. presence in the customer service area in the near future. One application which can be used to improve customer service is the chatbot.

### **2.3 Data Analytics**

Data Analytics is very vital especially in the e-commerce and retail industry. The amount of data getting collected can be analyzed in order to predict purchases, profits, losses and can even help companies how to market their products better in order to entice customers even more by tracking their buying behavior. These forecasts are made by collecting the past data leading up to the most recent transactions and analyzing

it to predict a trend. Algorithms can be made in order to collect, classify, and organize necessary data which involves customer preferences, behavior, recent purchases, and frequently browsed sections.

#### **2.4 Chatbot**

The word “chatbot” originates from the two words chat and robot and describes a relatively new computer application that simulates human conversation that allows humans to communicate on a virtual entity as if they are communicating with a real human. (Definition of Chatbot in, n.d.) Benton and Radziwill (2017) both describe a chatbot as an impression of humans interacting online but are actually communicating via a computer software designed by a natural language algorithm. It is vital for every success of a chatbot that the users feel acceptance of the chatbots being able to mimic human conversations without any distinction when chatting to a real human. As the e-commerce business goes larger every day and customers getting more and more complex and difficult to handle, chatbots could soon become one of the upcoming solutions to address this issue. The growth of messaging applications and the advances in A.I also contributed to the sudden surge of interest in chatbots (Guzman &Pathania, 2016)

Weissensteiner, A. A. A. (2018) states in her paper the three major components of a chatbot. The interface which acts as a medium between the users and the chatbot itself through a app. The “intelligence” or the A.I itself which will solve and understand customer queries and lastly the integration which depends on what platform the chatbot will be implemented and the information system that involves it. Preece 1994 also stated that chatbots also consists of inputs and outputs. Inputs are described as the entering and recording of data into the system and delivering instructions to another. A user’s input into the system must match one of the pre-defined output from the chatbot in order for the system to interpret it correctly and produce favorable results. Output is what the chatbot is able to relay to the users that must be put into a proper structure in which the users can understand. Constant feedback based on the output is one important thing to consider when using the system in the long run.

Chatbots may serve a number of services such as social and emotional support, industries involving information, entertainment and even now which is the customer service support can be a promising alternative as opposed to the traditional customer service that we have today. They also represent a major shift with how humans interact with data and services in a virtual sense (Brandtzaeg, P. B., &Følstad, A. 2017).

#### **2.5 Chatbots for Customer Service**

There is now a wide emerging body of studies and research that focuses on user experiences based on the conventional customer interfaces. The interest for chatbots may have seen a substantial development over the past few years. A huge wave particularly occurred circa in the year 2016 with the emergence of Apple’s Siri and Amazon’s Alexa in which they play a huge role in paving the way for the innovations being done in artificial intelligence and natural language processing and their capabilities to accurately interpret what their users are saying (Følstad, A., &Skjuve, M. 2019). These particular advances and interest also manage to renew potential for chatbots to be used in customer service.

In the context regarding customer service, chatbots may serve as a preliminary line of support by providing an accessible and low-threshold source of help and information for frequently asked questions and support tasks. Industries such as Retail, finance, and Information and Communication technology are just some of the sectors that have begun introducing chatbots for customer service (Nordheim et al. 2019). Consultant and Advisor companies such as CapGemini, Oracle, and Forrester, have predicted that chatbots will become an important part of customer service in the future.

#### **2.6 Ongoing Research and Apps**

Cui, L et al is currently a web-based service chatbot for e-commerce websites that aims to address queries from customers in enhancing a user’s online shopping experience. SuperAgent is a powerful customer service chatbot leveraging large-scale and publicly available e-commerce data. E-commerce websites such as Amazon.com, Ebay.com, Lazada, Shopee and the like tend to contain a significant amount of in-page product descriptions and user generated content that the user may feel overwhelmed upon seeing. It is added as an add-on extension to mainstream web browsers such as Microsoft Edge and Google Chrome.

Given a specific product page and a customer question, Super-Agent selects the best answer from existing data sources within the page. SuperAgent is comprised two main functions that all aim to answer varying queries by the customers with regards to product information and reviews. SuperAgent’s QA engine is designed to answer question regarding facts about the product. Product Information is stored in the format of knowledge triples (product name, attribute name, attribute value) Using a deep learning based matching framework, the chatbot is able to answer the product query via response sentences with predefined templates. Suppose a customer asks about the specifications of a particular computer, the chatbot automatically process the question and then choose the appropriate response due to the complex algorithm implemented. In sorting

out customer reviews, SuperAgent uses a customized set of algorithms that determine whether a particular set of customer review is relevant to the product listed and whether it is sufficient enough to be answering opinion-oriented questions. SuperAgent leverages state-of-the-art NLP and machine learning techniques, including fact QA, FAQ search, opinion-oriented text QA, as well as chat-conversation modeling that improves the end-to-end user experience in terms of online shopping. The application of this advanced query answering AI to E-commerce business may provide a huge boon in increasing customer service which is very valued in today's economy of fully online transactions.

Lasek, M., & Jessa, S. (2013) analyzed the usage of chatbots for customer service on hotels' websites. They obtained unique data from five various webpages exhibiting various configurations, containing a total of 17413 user statements in 4165 conversations and analyzed the effect of having a chatbot handle a hotel's customer service. The Hotel Chatbot managed to fill in some function as an information tool but still needs a lot more data to simulate in order to fully function as intended for customer service.

## **2.7 Opportunities and Challenges**

One main advantage that chatbots have against traditional customer service are their permanent availability. Chatbots are online all the time, handling the user's queries as opposed to traditional services were interacting via telephone calls or face-to-face contact are the only possible solutions for communicating to customers. The problem of customers "waiting" in line for a query is also solved by since most chatbots are equipped with handling unlimited queries at the same time (Weissensteiner, A. A. A. 2018). Chatbots can also be programmed into making recommendations based on past information, preferences, and order histories of the customer. Deploying chatbots on e-commerce platforms and websites is beneficial as it can also take over the return process, reducing resources spent on staff and increasing customer satisfaction and loyalty.

Jain (2016) summarizes the four main advantages of chatbots which include added convenience, saved costs, the opportunity to maximize customer engagement and outreach and minimize customer service man hours. The ability to function effectively as a customer service support while taking lesser resources than traditional support does makes it a very enticing option for organizations in the e-commerce industry.

However, these are also a couple of disadvantages need to look at for starters as chatbots are programmed by developers, they exist of out of pre-programmed knowledge and will only recognize an input if it accords to an expected path. Any deviant answers will cause the system to not function properly and the output to be greatly affected. The output will therefore either be repetitive or irritating for the customer, or worse does not provide the correct answer and thus leaving users unsatisfied Fakhruddin, H. (2017). Furthermore, chatbot development consumes a huge amount of time and data in order to gather as much possible inputs and record them to pre-made outputs.

In the labor department, as with all automation, the decrease of customer service man hours due to implementation of chatbots could possibly contribute to a decreasing demand for workers (Jain 2016). Low-level and repetitive tasks jobs will be the first ones to be affected ones, becoming replaced by a chatbot as a standardized process. This can become problematic with developing countries where a large population fully depending on it as their main source of livelihood.

### 3. Methods

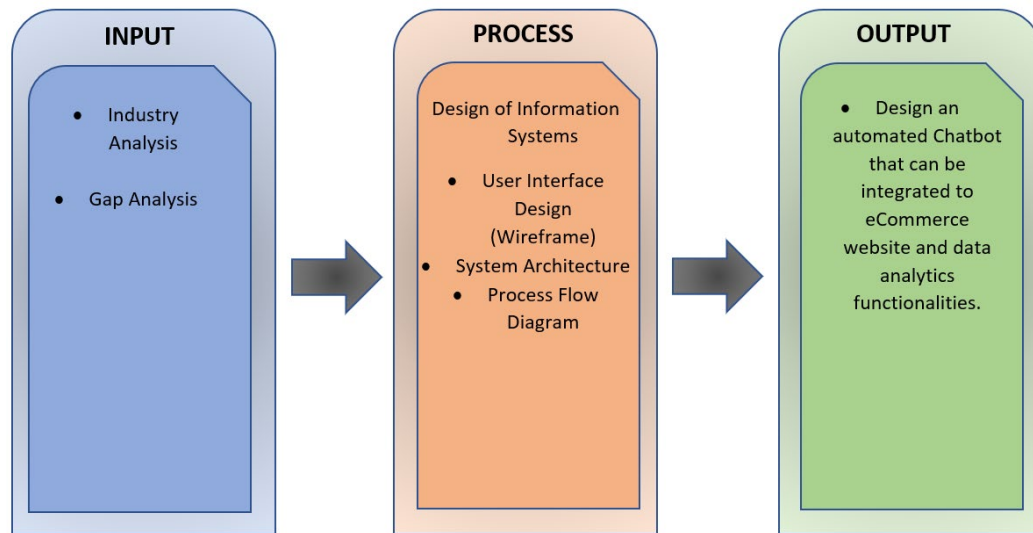


Figure 1. IPO

Figure 1 serves as the research framework of the entire project. In order to fully utilize the resources, the researchers intended to follow the IPO presented above. During the INPUT phase, the industry analysis serves as the initial observation phase to aid the project conceptualization of the researchers. With the use of SWOT analysis, the researchers were able to identify the areas that an e-Commerce website should improve to be able to improve the customer's shopping experience and after-sales experience. Using the Gap analysis, the researchers were able to identify the key areas that are available for study. With this, the objective can be formulated with the basis of the strengths, weaknesses, opportunities, and threats of the industry. During the PROCESS phase, the initial design of the Information system takes place. The designs of the information system shall provide the initial idea for which researchers shall follow for the consecutive graphs, and diagrams. The design of the information systems shall be accompanied by the wireframe samples which would serve as the user interface sample. The process flow and system architecture shall then follow which would give a brief idea to the functionality and process of the entire project. Combining all phases shall produce the design of the enhanced automation Chatbot for customer service that can be integrated into any e-commerce website with Data Analytics Functionalities which concludes the entirety of the IPO seen in Figure 1.

#### 3.1 Contents

The project will focus on the automation of the customer service of the developed website to help improve their after-sales transactions with their customers. The project's chatbot project will help narrow down the concerns to find the main issue from the conversation with the user or the customer in which the host site will then be notified by a copy of the conversation and possibly presentation dashboards that shows the similarities of the problem with other similar cases. Since data analytics is part of the project's content, the overall development shall be designed in preference with the hope of having a customer service with data analytics as one of its primary functions. For the duration of the project, "Customers" shall pertain to the eventual customers of Buddy Shop while "Users" shall pertain to the admin/management of the Buddy Shop.

##### Shop Buddy as a Customer Support

Shop Buddy is the automated chatbot featured in the Buddy Shop website. This is designed similarly to a normal chat box with a few minor tweaks. The Shop buddy shall provide pre-defined questions to help narrow down and summarize the customer's concerns and issues encountered during after-sales transactions. Once the customer ends the conversation, the Shop Buddy then provides simple solution to the user as means of suggestion to satisfy the customer on his/her concern. A copy of the conversation will be sent to the customer's stored data chats like how messaging platforms divide conversations with different users. While on the other side of platform, the site's customer service representative can access the chats on their databases that can be accessed using the designed dashboard.

##### Shop Buddy for Data Analytics

One of the primary objectives of the project is to use chatbots as means for data analytics to gather data. Shop Buddy in particular, being an automated chatbot, shall store the information gathered from the conversation with customers on a database which can be accessed in a database. This information will be summarized and sorted and manipulated into a dashboard for data visualization. The data gathered from the Shop Buddy activities shall be accessible for users using data analytics to help the business for critical decision making and strategic events.

### 3.2 Design of Information Systems

In designing the project, the researchers would focus on: The Shop Buddy. This area would make up the entirety of the project and would be the focus of the benefits and uses of the project.

#### The Shop Buddy

The Shop Buddy is the automated customer service chatbot connected with the Buddy Shop. This chatbot is a predetermined chatbot that features questions and options that the customer can choose from to narrow down their concerns. The Shop Buddy shall also display A.I. inspired conversation capabilities to make the customers more comfortable in interacting with the chatbot. The Shop Buddy shall feature the following inclusions in its capabilities:

- E-commerce Website Compatibility. This would allow the chatbot to be easily integrated into any e-commerce website.
- Data Analytics Functionalities. This would serve as an area for Shop Buddy to improve as the data gathered from customer interactions using the chatbot could be integrated into gathered data for data analytics.
- Main Option. This would allow the customer to initially choose their concerns before interacting with the project.
- Specific Options. This would serve as the additional options to help the project initially narrow down the problems that the customer has encountered.
- Chatbot Field. This would be the main area that the chatbot would use to converse with the customer. This is where the chatbot would continuously ask questions to record and create a narrative of the problems faced by the customer.
- Delivery Tracker. This would serve as the additional feature that the project plans to utilize, mobile tracking of the customer's package is essential and having a convenient way of tracking a package is essential for the customer.

### 3.3 Presentation of Designs

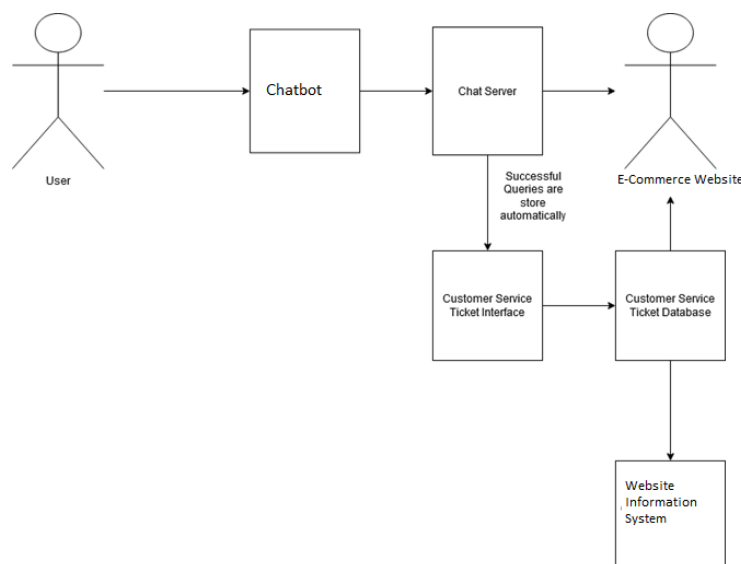


Figure 2. System Architecture



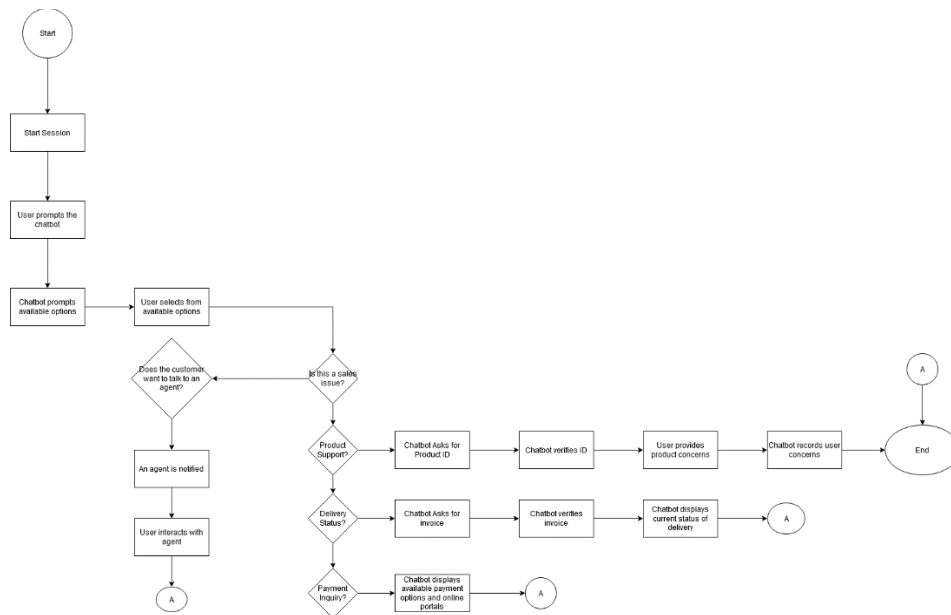


Figure 3. Process Flow

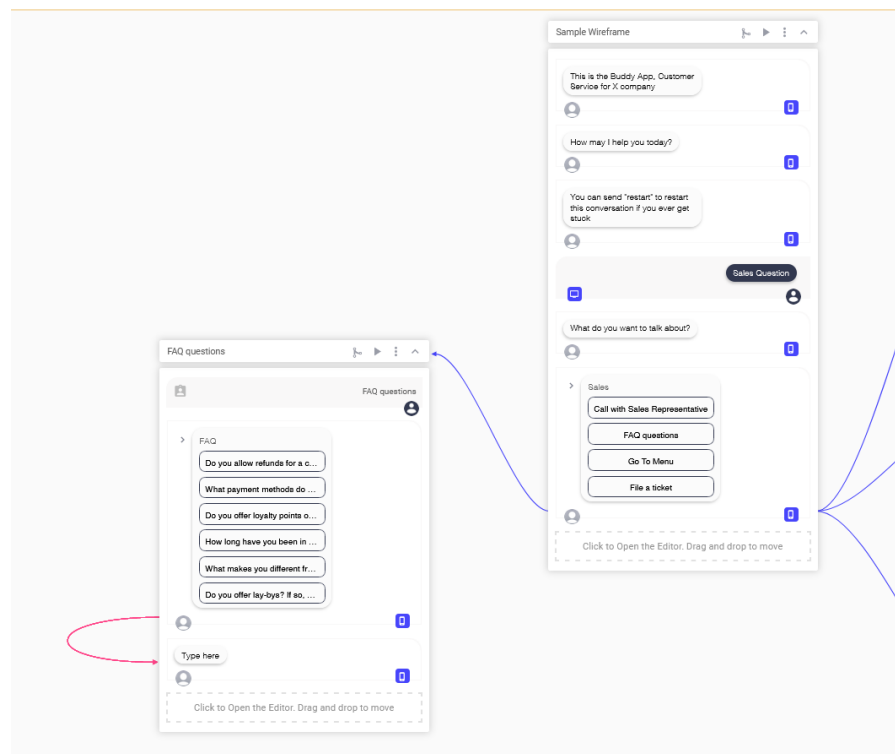


Figure 4. User Interface Wireframe 1

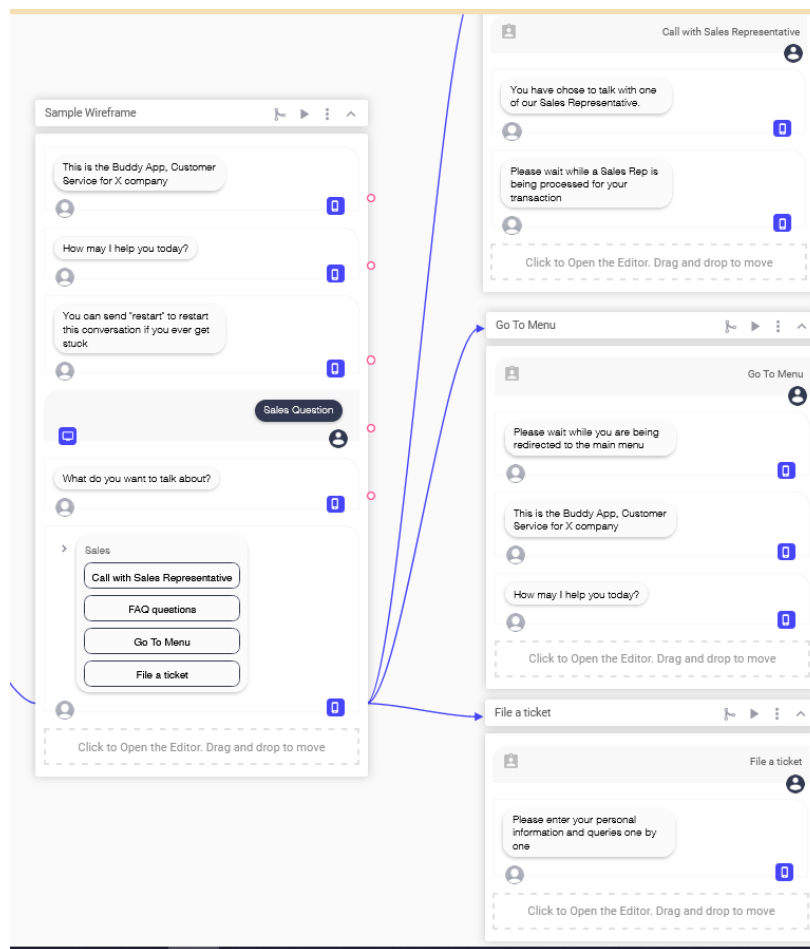


Figure 5. User Interface Wireframe 2

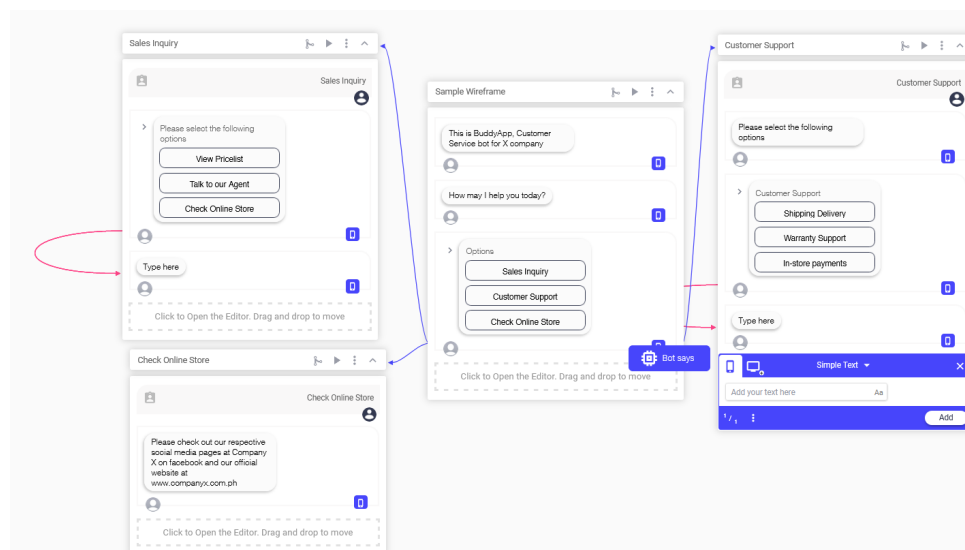


Figure 6. User Interface Wireframe 3

The overall design of the project is seen on from Figure 2 to Figure 6. Figure 2 displays the streamlined view of the proposed system architecture. With this, it considers the functionality and application of the project. Like a use-case diagram, the systems architecture showcases how the potential user and customer could interact using the proposed system. In the Figure 3, features a more in depth look at the process flow of the proposed project. Within this, the researchers considered the design of the information systems of the project which was incorporated on how the project acts and is being utilized. Figures 4, 5 & 6 presents the actual idea or design of the focus of the project, which is the chatbot. This presents the different pre-determined outcomes and paths that the chatbot would consider when interacting with the user. It is also seen that the chatbot presents different options and specific options to the user to help narrow down the request.

#### 4. Conclusion

Innovation is almost often the initial process for technology implementations in the business sector. In business and technology, innovation is critical, and since technology offers a range of opportunities to develop a business and its structures, the business can fully leverage the technological advantages offered by technology. All e-Commerce sites have components that are highly technologically incorporated. However, there is one aspect of e-Commerce that has been overlooked: customer service. It is more than evident when using the above applications that the customer service ignores precision and also acts as a vulnerability for the online shopping environment. With this, the researchers want to create a chatbot that can manage customer experience while also presenting information gathered from all of these interactions as valuable data analytics.

One of the possibilities is the right of users to ask questions about their issues. Another choice is to use data analytics to decide which of the users' or customers' key issues and grievances should be handled by the company. Customer service is an important part of any company, but it is particularly important in the e-Commerce industry. Since the e-Commerce sector is one of the many and has the most interactions with retailers and consumers, having a dependable customer support team is vital to the success of the company.

In order to further strengthen their after-sales transactions with their clients, the project will concentrate on automating the customer service of the established website. The chatbot project of the project will allow to identify the issues and determine the key issue from the user or customer interaction in which a copy of the interaction and likely presentation of dashboards will then alert the host site that demonstrates the comparisons of the issue with other similar instances. Since data analytics is a component of the project's content, the overarching implementation should be planned with the intention of providing a customer service that incorporates data analytics among its primary purposes.

The researchers will concentrate on one distinct area when developing the project: The Shop Buddy. This area would represent the essence of the project and would be the subject of the project's advantages and benefits. The Shop Buddy is the automated customer service chatbot connected with any E-commerce website. This chatbot is a predetermined chatbot that features questions and options that the customer can choose from to narrow down their concerns. And lastly, the data analytics features of the project shall be used by the users of the website and shall showcase the data analytics portion of the project.

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### **Biographies**

**Sean Justine C. Español** is a third-year college student currently studying at Mapua University taking up Information Systems. He previously attended in Pasig City Science High School and graduated in Sacred Heart Academy of Pasig while enrolled in the STEM strand. He is currently the head executive officer for the Info-Systems Next-Gen organization in the said campus.

**Romulo “Rom” Fronda** is a senior Bachelor of Science in Information systems student specializing in Enterprise Resource Planning at Mapua University, Philippines. He was the former Vice President for both the Mapua Integrated Computer Organization and the Info-Systems Next-Gen Organization for over 2 years. Currently, he is one of the Board of Directors for the Info-System Next-Gen who acts as a student adviser for the organization as a former executive. He studied junior high school in Dubai, UAE before moving to the Philippines to study information systems.

**Mikka Rosella C. Villarica** is a senior at Mapua University where she is taking up Bachelor of Science in Information Systems and she is specializing in Enterprise Resource Planning. She is currently the Executive Vice President of their organization which is Info-Systems Next-Gen. She is also the Council of Organization Officer (COO) who communicates with all the organizations in Mapua University. But before she became the External Vice President of the said organization, she became a secretary for 2 years. She enjoys playing sports most especially in basketball and softball. She graduated Senior High School in the same university, and she graduated with honors.

**Grace Lorraine Intal** is a full-time faculty member in Mapua University. She is teaching Information Systems core courses in the School of Information Technology and Information Systems course in the School of Industrial Engineering. She obtained a BS degree in Management and Industrial Engineering from Mapua University, Master in Business Administration from Pamantasan ng Lungsod ng Maynila and Master in Information Systems from Asia Pacific College respectively. At present, she is pursuing a Doctorate degree in Information Technology at the University of the Cordilleras. She is also an independent Management Consultant.