Developing Bilingual Web-based Chatbot for Customer Service

at Start-up Companies

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Abstract.

Customer Service is a crucial part of a business to assist and conduct interaction with their customers. However, not all businesses have representatives to run this activity. Some companies that still do not have Customer Service staff are Creative Advertising Bali and Goddess Bali. Since those companies are grouped as start-ups, they only have a few employees. Moreover, most of the people who live in Bali are foreigners and non-Indonesian native speakers. This study aims to develop a bilingual web-based chatbot. The researcher used Design and Development Research model by Richey and Klein with adapted five stages including analysis, design, development, expert validation, and evaluation. The researcher conducted interviews with company owners, direct and indirect observations, and distributed questionnaires to potential customers as a data collection method. Based on the interview with company owners, they sometimes get foreign customers when they are not good at English. As a result, the researcher develops a bilingual web-based chatbot for customer service. The output of this study is a website and bilingual web-based chatbot containing some frequently asked questions. Based on the result of expert validation and evaluation stage, the product can be applied. To sum up, the researcher hopes that this study can be beneficial for many parties, especially for partner companies.

1. Introduction

Customer service is the action of a business to assist its customers in finding their needs. This activity tends to influence the customer's view of a business. Good customer service can retain customers' loyalty. Therefore, customer service professionals are required to complete numerous tasks and responsibilities, including presenting information about a company's offerings, answering questions related to the company's products and services, completing transactions and orders, handling customer complaints, and many more. To reach those effective strategies, the use of technology in customer service is crucial.

Technology is one of the most important things in human life. In the current era, technology is very influential on the success of a business. Every business must build a positive brand image and act professionally with customers. Hereby, good customer service helps businesses achieve success. One way to get a good image from customers is to respond to customer messages quickly. With this, technology is needed to assist the operations of the business. For example, by utilizing cognitive tools that can be used to help messages from customers to a business (and vice versa) more personalized. Therefore, the chatbot feature provided by various social media platforms was created.

Generally, chatbot is a robot or third party that helps humans to communicate with one another faster. According to Anagha et al. (2022) chatbot is a technology that allows a computer to communicate with people, that respond to a user's natural language questions with the most suitable answer. The only job of a chatbot is to get the input from the user and return the processed response as per the input (Akhil, 2019:6). The background for creating chatbot was because Creative Advertising Bali and Goddess were still lack of employees to respond to their customers effectively. Also, the companies encountered some problems regarding the communication skills especially when using English. Therefore, this chatbot would respond to the customer enquires faster. In addition, this chatbot was available in two languages or bilingual because the customers were mostly non-Indonesian native speaker who did not speak Indonesian well. With this chatbot, the writer expected some benefits for the companies such as help them to do customer service, to help working faster, and to help the start-ups communicate with more potential local and foreign customers. To sum up, the study aimed to develop a bilingual web-based chatbot for customer service in two start-up companies in Bali,

addressing their struggles in dealing with their customers, especially non-Indonesian native speakers in the area.

The researcher conducted research on two start-up companies located in South Denpasar, Bali. Each company runs its business in a different sector. Those companies include Creative Advertising Bali and Goddess Bali. Creative Advertising Bali is an advertising production company. On the other hand, Goddess Bali is a garment company that specializes in jumbo sizes clothing & apparels for women. Based on the interview with the company's owner, they stated that still do not know how to create tools to respond the customers quickly when they are away from keyboard or have so many things to do. Both of the owners agreed if the bilingual web-based chatbot is created for their companies. Therefore, the researcher decided to develop a chatbot for their websites that would be available in two languages English and Indonesian. Finally, the current study was hopefully be beneficial for those two start-up companies to help them in serving their customers.

2. Review of Literature
2.1. Customer Service

Customer service is the process of responding to customer needs by providing professional, helpful, and quality service and support before, during, and after their needs are addressed (Hyken, 2015). According to the book "Managing Customer Service" by Hayes and Dredge (1998), there are several aspects that customers expect from customer service including: timeliness, flexibility, friendliness, honesty, expectations, quality, problems, value, reliability, and communication.

Customer service can be done through 3 types of communication: in person, by phone, and towards internet. Mapua (2014).

Referred to the book entitled "Communication Skills" by Sen (2007) , there are two types of communication network in an organization: internal and external. Internal network involves interactions among the members of a company, which may administrative communication and human resources/personnel communication (employee communication). Next, external network involves customers, suppliers, service companies, the media, government, and other businesses. On the other hand, Sen (2007) also stated the seven C's of strategy for effective communication: coutesy, clarity, conciseness, concreteness, correctness, considerations, and completeness.

2.2. Website

A website is a collection of World Wide Web pages typically linked to one another accessible through a single domain name. A website is usually published online and made available online by a person, business, institution of higher learning, government, or organisation. The communication on websites is such a quick-changing phenomenon (Pym, 2011). Therefore, in the book entitled "Website Optimization" stated that a website developer should focus on some aspects to maximize website value and boost website traffic. The science, the art, and the business of Internet marketing are all integrated into website optimisation. From persuasion tracks to algorithms of search engine, from load performance to pay-per-click campaign management on the web page (King, 2008). Another finding by (Rocha, 2012) discussed about the components of website quality. The three main components of website quality are content, technical, and service quality.

2.3. Chatbot

Chatbot is a computer program that acts as a conduit for human users and a piece of software, communicating mostly through spoken or written natural language (Galitsky, 2019). In a business, chatbots are the means by which users can stay in regular contact with the business/brand and they provide the business with the ability to interact with users easily. Chatbot developers need to start with some data to bring their chatbots alive. Usually, the data is generated by the developers themselves for the processes they need (Singh et al., 2019).

According to the book "E-Learning and the Academic Library: Essays on Innovative Initiatives" (Rice & Gregor, 2016), there are two primary categories of chatbots. The first category is a "stand-alone" application. This type of chatbot operates on one computer. Secondly, "web-based" application. This type of chatbot operates on a remote server and is accessible from more than one computer via website page. Compared to stand-alone chatbots, web-based chatbots have the advantages of giving users more control over the behaviour and personality of the bots. Multiple computers can access web-based chatbots.

A web-based chatbot defined as a program of computer that communicates with users through a conversational user interface and initiates text-based conversations with human users (Chbeir et al., 2022). Presented in the book entitled "Web Information Systems Engineering", (Chbeir et al., 2022) also stated the advantages of web-based chatbots. Web-based chatbots enable more effective customer service and human resource management. Increased sales, quick responses to consumer questions, and behavioural insights are among advantages that web-based chatbots provide website owners. To conclude, there are several advantages of creating a web-based chatbot as presented by (Rice & Gregor, 2016) and (Chbeir et al., 2022) including accessible through multiple devices, help business owners to build a better customer service, reduce queues and waiting time.

A good chatbot obviously has some criteria or characteristics. Ferreira et al. (2019) interviewed some people related to chatbot technology in banking sector. Their research revealed some facts. More than 75% dissatisfied with the way chatbot provide appropriate answers, even though the technology can give them answers promptly. From this result, the criteria of a good chatbot is being informative to users. Also, the easiness of the use and can reply to customers immediately still be the criteria. Additionally, those interviewees expressed low confidence in the privacy and protection of their data when utilizing chatbots out of concern that the information would be leaked out. The rest of the interviewees who are satisfied with the chatbot explained that most of them prefer convenience as their first criteria. In other words, they will continue to use chatbot based on their positive experience. Other criteria of a good chatbot provided by (Nguyen, 2019) including ten aspects of measures: the completeness, accuracy, understandability of information, responsiveness, usefulness, reliability, assurance, empathy, satisfaction, and easy of use. To sum up, there are some points of a good chatbot stated by Ferreira et al. (2019) and (Nguyen, 2019). It concludes that a chatbot should be informative, immediately, easy to use, safety or protects user's privacy, convenient, complete, accuracy, understandable, and user satisfaction.

4.4. Start-up Companies

Start-up companies are newly born companies that struggle for their existence (Salamzadeh & Kesim, 2015). Basically, start-up companies are the business in the early stages of their phase. According to Steve Blank, as cited in (Immanuel, Suguna, & Rajalingam, 2021:57) there are six different types of start-ups: Life Style Start-ups, Small Business Start-ups, Scalable Start-ups, Buyable Start-ups, Large Company Start-ups, and Social Start-ups. On the other hand, Bansal (2021:62) also stated 5 common types of Start-up Companies which have different approaches to scaling: Small Business Start-ups, Buyable Start-ups, Scalable start-ups, Offshoot Start-ups, and Social Start-ups. Based on the explanation of two experts, the types of start-up companies are actually identical with some in different terms. For example, Small Business Start-ups, Scalable Start-ups, Buyable Start-ups, and Social Start-ups. Based on the explanation of the types of start-up companies, this study observed the two small business start-ups in Bali that are running their business in different fields.

3. Research Methodology

This study used a design and development research, focusing on product and tool research. There were four stages of the research followed as presented in Figure 1. Main respondents of the study were the company owners and the potential customers of Creative Advertising Bali and Goddess Bali for the preliminary study. The try-out was done by involving expert validators to try out the application. Methods of data collection included observation, interviews, and survey.

4. Findings and Discussion

Two main parts of the findings and discussion are presented in this section.

4.1. Preliminary Study

a. Creative Advertising Bali

The researcher conducted observation within 2 weeks started from February 27 until March 10, 2023. The activities carried out by the researcher were to observe the employees who were working there and figured out that the owner was also working as the employee to produce advertising stuffs. There was no particular staff to handle online customers other than the owner himself.

Furthermore, the researcher also conducted an interview with the owner of Creative Advertising Bali on March 6, 2023 at 15.00 WITA. The purpose of this interview was to gain more information about how this company deal with its customers. The owner of Creative Advertising Bali, Mr. Eko Budi Santoso said that he used some social media to promote his business including

WhatsApp, Instagram, and he also added that recently this business was more active on Facebook marketplace to post the products and to gain new potential customers.

Researcher   : What social media do you use for your business?
Owner   : We have Instagram, WhatsApp, and currently are more active on Facebook marketplace to obtain new potential customers.

The next question was about the products and customers of Creative Advertising Bali. Mr. Eko stated that this company sells advertising products such as embossed letters, neon sign, Billboard, etc. This company could sell approximately 10-20 sets of signs to customers depending on the situations in Bali. Mr. Eko also stated that this company sometimes got foreign customers. Additionally, this company has 3 jobholders including the owner, and has some people to work as freelancers. Lastly, the researcher doing interview related the importance of Bilingual Chatbot for Customer Service at Creative Advertising Bali. Mr. Eko confirmed that the tool developed by the researcher is very needed to make this business easier in dealing with customers, especially foreign customers.

Researcher   : According to you, is the chatbot that I will create needed in your company?
Owner   : Yes, it is definitely needed. Moreover, I do not have a specific staff to handle everything. Just to be quick. If I myself usually take a while to reply to people.

The researcher distributed questionnaires mainly to the Instagram of Creative Advertising Bali and gained 14 respondents. All respondents (100%) agreed that the development of bilingual chatbot in Creative Advertising Bali is necessary. Hereby, developing a bilingual chatbot is needed for this company.

The next question was about the reason(s) why should be developing chatbot for Customer Service at Creative Advertising Bali. The following 2 questions were in form of checkbox that allowed the respondents to choose more than one answers. Most of the respondents (10 respondents) said that developing bilingual chatbot is needed to get direct information without queuing.

The following is presented the question related to the 'frequently asked questions' by customers to an advertising company. It shows that frequent questions asked by customers to an advertising company is price (12 respondents).

2.Goddess Bali

The researcher conducted observation in Goddess Bali on February 27, 2023. The activities carried out by the researcher were to observe the activities in this company. Apparently, only few employees were working in the office. The rest of employees were working from home. Goddess once had clients from Malaysia and Australia. Therefore, Bilingual Chatbot for Customer Service at this company needs to be developed.

On the other hand, the researcher also conducted an interview with Ms. Dewi, the owner of Goddess Bali on March 01, 2023 at 17.00 WITA. The purpose of this interview was to get to know more about how this company is running and dealing with its customers, especially online customers.

The owner of Goddess Bali, Ms. Dewi said that she employed some ways of selling using some social media including Facebook, Instagram, and TikTok. She also added that Goddess markets its products on marketplace such as Shopee, Lazada, Tokopedia, and TikTok Shop.

Researcher   : What social media do you use for your business?
Owner   : We use Facebook, Instagram, TikTok. For marketplaces we have Shopee, Lazada, TikTok Shop, and Tokopedia

The next question was about the products and customers of Goddess Bali. Ms. Dewi informed that this garment company sold fashion products such as dresses, pants, tops, and so on. This company could sell hundreds or even thousand pieces of products depending on demand on special events. Ms. Dewi added that Goddess had 13 employees in total with 6 people were working from the office, and

7 tailors were working from home. Lastly, the researcher did interview related the needed of Bilingual WhatsApp Business Chatbot for Customer Service at Goddess Bali. Ms. Dewi agreed that the product developed by the researcher is needed to apply in her company to make her customers easier to handle, especially if there any foreign customers.

Researcher   : According to you, is the chatbot that I will create needed in your company?
Owner   : Yes, of course this will be needed for my business.

The researcher also distributed questionnaires to some prospective customers through WhatsApp private messages, and gained 11 respondents. From the Respondents' Opinion about Developing Bilingual Chatbot for Goddess, it is known that all respondents (100%) agreed that the development of bilingual chatbot in Goddess Bali is needed. Hereby, developing a bilingual chatbot is necessary for this company.

The next question was about the reason(s) why should be developing chatbot for Customer Service at Goddess Bali. The following 2 questions were in form of checkbox that allowed the respondents to choose more than one answers. It is stated that he most of the respondents (7 respondents) said that developing bilingual chatbot is needed to get quick and instant service.

The following is presented the question related to the 'frequently asked questions' by customers to a garment company. It is known that frequent questions asked by customers to a garment company is price (10 respondents).

4.2. Developing Bilingual Web-based Chatbot

In this research, the hardware used by the researcher were external keyboard and mouse. Moreover, the software used by the researcher were Windows 10, Mozilla Firefox, Lead Chatbot, Bootstrap, Hostinger, Smartcat, and Canva. Presented in Figure 10 is the interaction within the chatbot.
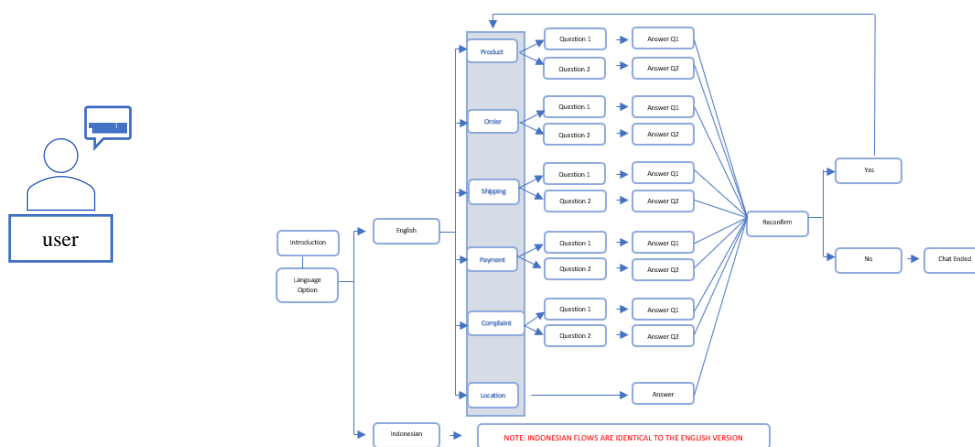
Figure 10. Chatbot Interaction

After the websites and bilingual chatbot done created, the next step was embedding the chatbot into the company's website. Because to add the chatbot to the website used HTML code as programming language, the researcher asked an IT professional to help. After finishng all steps, the chatbot icon appeared every time visitors open the website.
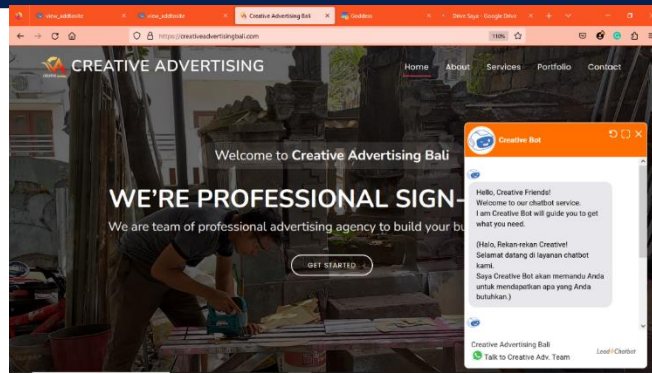
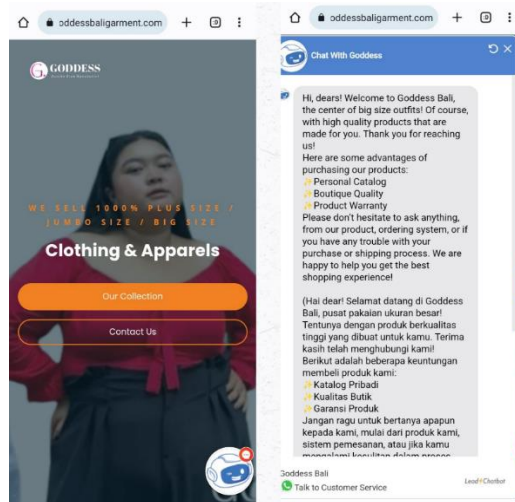**Figure 11.** Chatbot Display on Desktop

Figure 12. Chatbot Display on Smartphone

Experts should evaluate the following aspects: contents, Information Technology, and language. To get ideas and feedback for project development, expert validation had been done by the researcher. The score as determined by expert validation is shown in the following table.

Criteria of Validity	Validity Level
81 – 100	Excellent (can be applied)
61 – 80	Good (can be applied)
41 – 60	Good enough (should be revised)
21 – 40	Bad (should be revised)

Table 1. Validation Sheet of Content Validator (Creative Advertising Bali)
Formula:

- **Average :** $\frac{total\ score}{total\ statement} = \frac{92}{16} = 5.75$ (out of 6)
- **Score :** $\frac{average}{6}\ x100 = \frac{5.75}{6}\ x100 = $ **95.8 out of 100** = Excellent (can be applied)

Figure 13. Revision by Content Expert of Creative Advertising Bali

Formula of Content Validation (Goddess Bali):

- **Average :** $\frac{total\ score}{total\ statement} = \frac{90}{15} = 6$ (out of 6)
- **Score :** $\frac{average}{6} x 100 = \frac{6}{6} x 100 = $ **100 out of 100** = Excellent (can be applied)

Formula of Language Validation for Creative Advertising

- **Average :** $\frac{total\ score}{total\ statement} = \frac{118}{27} = 4.37$ (out of 6)
- **Score :** $\frac{average}{6} x 100 = \frac{4.37}{6} x 100 = $ **72.83 out of 100** = Good (can be applied)

Formula of Language Validation for Goddess Bali:

- **Average :** $\frac{total\ score}{total\ statement} = \frac{116}{26} = 4.46$ (out of 6)
- **Score :** $\frac{average}{6} x 100 = \frac{4.46}{6} x 100 = $ **74 out of 100** = Good (can be applied)

| Before	After
Do you provide free installation? Answer: We do provide a free installation fee*. The total price of the product you order includes the installation fee. So, you don't need to pay any additional fees. Thank You.	Do you provide free installation? Answer: We do provide a free installation fee*. This is an inclusion. So, you don't need to pay any additional fees. Thank You.

Figure 14. Revision by Language Expert

Formula of IT Validation for Creative Advertising Bali:

- **Average :** $\frac{total\ score}{total\ statement} = \frac{51}{11} = 4.63$ (out of 6)
- **Score :** $\frac{average}{6} x 100 = \frac{4,63}{6} x 100 = $ **77.16 out of 100** = Good (can be applied)

Formula of IT Validation for Goddess Bali:

- **Average :** $\frac{total\ score}{total\ statement} = \frac{52}{11} = 4.72$ (out of 6)
- **Score :** $\frac{4.72}{6} x 100 = \frac{5.75}{6} x 100 = $ **78.66 out of 100** = Good (can be applied)
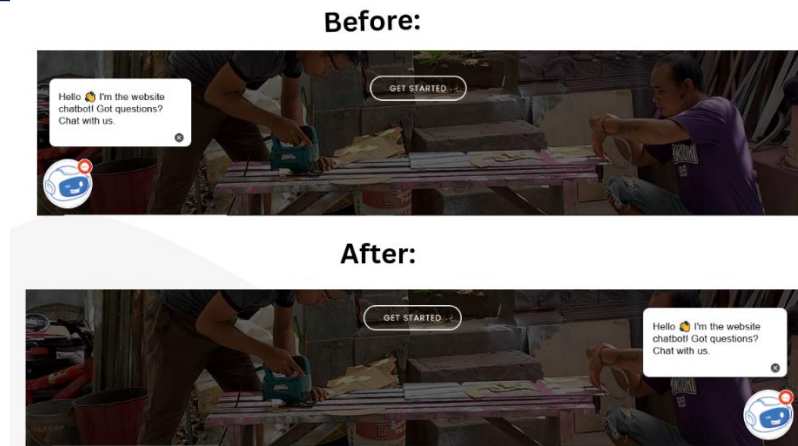
Figure 15. Revision by IT Expert

The last part of the stage was evaluation. The first evaluation was for Creative Advertising Bali. The results of the respondents' opinions are presented in the Table 8.

Formula of Creative Advertising Bali Evaluation:
- **Total Average :** 5.71 (out of 6)
- **Score :** $\frac{total\ average}{6} x\textbf{100} = \frac{5.71}{6} x100 = $ **95.16 out of 100** = Excellent (can be applied)

Formula of Goddes Bali Evaluation:
- **Total Average :** 5.65 (out of 6)
- **Score :** $\frac{total\ average}{6} x\textbf{100} = \frac{5.65}{6} x100 = $ **94.17 out of 100** = Excellent (can be applied)

4.3. Discussion

The idea of creating chatbot for Indonesian and foreigner was the main reason for this study to be done. Therefore, the researcher developed bilingual web-based chatbot for cusstomer service at start-up companies. In developing web-based chatbot, the researcher applied Design and Development Research model by Richey and Klein (2014) with five stages adapted including analysis, design, development, expert validation, and evaluation.

The first product created by the researcher was a website for Creative Advertising Bali and Goddess Bali. This product purposed to be the platform of bilingual chatbot placement. Despite of the main purpose, the website should contain infromative and interesting content to attract visitors. Therefore, the researcher created contents related to the company started from company's description, product/services to contact. Each website was made by applying the components of website quality as stated by (Rocha, 2012). The theory stated that there are three main components of website quality including content, technical, and service quality. The researcher provided the contents that technically can be linked to another section and the website can be accessed easily. Referred to the content validation, the researcher got excellent score which mean that the products already fulfill content quality. For the technical quality, the researcher used the validation from IT expert. In this aspect, the researcher got score 77.16 and 78.66 that indicates good and the products could be applied. Lastly, for the service quality, the validation used was from language expert. The researcher gained score 72.83 and 77.16 that indicated good and products could be applied. In conclusion, the development of websites in the current study cotains all of those criteria.

The second product created by the researcher was bilingual web-based chatbot. This product aimed to be the customer's assistant to provide information related to the company. Ferreira et al.

(2019) conducted a research related chatbot technology. Their research revealed that good criteria of chatbot was being informative to users, easy to use, and can reply to customers immediately. Based on the responses given by respondents in evaluation stage, mostly of them (77.3%) and (81.8%) strongly agreed that the chatbot developed by the researcher was informative. Next, for the easiness of use, (72.7%) of respondents mentioned that they are strongly agree. Lastly, a good chatbot is able to reply to customers immediately. Based on the statement "the chatbot quickly responds to questions from users with short time gap," the chatbot gained (77.3%) of respondents who mentioned strongly agree. To sum up, the chatbot developed by the researcher is valid and meet the criteria of a good chatbot.

5. Conclusion

The Development of Bilingual Web-based Chatbot for Customer Service at Start-up Companies had been done by the researcher by adapted Design and Development Research by Richey and Klein (2014). The research employed five stages in the development process including analysis, design, development, expert validation, and evaluation. The output of this current study are websites and bilingual web-based chatbot. The websites were developed as the home for the chatbot as well as the medium to display information about the company. Generally, the websites covered some pages including Home, About, Products/Services, and Contact. The second product was a bilingual web-based chatbot. This chatbot provides frequently asked questions by customers including product, order, payment, shipping, and complaint queries. In conclusion, the researcher expected to help the start-up companies to communicate with their customers efficiently by developing bilingual web-based chatbot for Customer Service.

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