

Designing an Chatbot with NLP Technology in a Website-Based New Student Admission Information System

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ABSTRACT

In the midst of rapid digitalisation, the challenge of providing responsive and quality services to applicants is faced by new student admission information system websites. At SMK Insan Teknologi (InTek), the service process is still done manually, such as the use of physical records of new student registration and incomplete information. The number of questions that are often asked causes delays in providing responses by staff. To improve administration and speed of response, the use of a chatbot is seen as one solution. The chatbot allows automated interaction with prospective students, while Natural Language Processing (NLP) is used to make conversations through chat more natural and easily understood by applicants. System testing was conducted in two ways. First, blackbox testing shows that the system functions well in responding to messages sent through the chatbot on the website, both from text that matches the intention and text that is abstract and does not match the pattern, with an accuracy rate of 87.5%. Secondly, the UEQ test results show a good level of accuracy. This research aims to build a chatbot that uses NLP methods to improve the efficiency and effectiveness of time in helping answer student questions without having to wait for a response from staff, and to measure the accuracy of chatbots used at SMK Insan Teknologi East Jakarta. This research is expected to improve service quality and administrative efficiency at SMK Insan Teknologi, and can be implemented in other educational institutions.



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I. INTRODUCTION

In this era of digital transformation, the role of information systems is becoming increasingly important in managing and utilising data. It can be seen that the integration between hardware, software, and the human element in information systems is vital. An efficient information system is not only a tool for decision-making and organisational control, but also creates an ecosystem where the interaction between humans and technology can generate significant added value. There are more and more new software, systems, and technologies that support company activities, ranging from data processing applications, systems that can help make

decisions, to artificial intelligence technology [1]. Advances in technology and information systems help many organisations, companies, and even institutions compete to achieve the goals they apply to the maximum. One of them is an educational institution that aims to increase the number of prospective students in order to increase the visibility of the institution by people who will continue to the next level of education or just looking for information [2].

This situation creates competitive competition between educational institutions, including private educational institutions. The process of serving prospective students is also carried out by Insan Teknologi Vocational High School, East Jakarta. Insan Teknologi Vocational High School East

Jakarta is one of the private schools with 'Very Good' accreditation located in the centre of East Jakarta. This school gives priority to prospective students who register, based on interviews with staff, the majority of prospective students come from poor families and rely on scholarships to pay for their school needs. The following is the number of students at Insan Teknologi Vocational High School in the last three years:

TABLE I
NUMBER OF PROSPECTIVE LEARNERS FROM 2022-2024

Year	New Student	Number Of Students In Vocational InTek
2022	200	600
2023	163	563
2024	100	465

Based on this data, it can be concluded that the average number of students at SMK Insan Teknologi is 550 students each year, but the number of students is not proportional to the administrative service staff.

TABLE II
NUMBER OF INTERNAL LEARNER DATA SET QUERIES SINCE 2024

Candidate Enquiry data	Frequency of Questions Appeared
Enrolment fee at SMK InTek school	45
Prospective students' clothing schedule	15
What vocational courses are available at this school	7
What achievements are there in SMK Intek	6
Are there extracurricular activities	10
What kind of facilities are offered	13
Vehicle access to school	8
Total Frequency of Questions	104

In the development of this chatbot, the data source used to train the NLP model is the internal dataset seen in table II from questions asked by prospective students of SMK Insan Teknologi East Jakarta during several previous registration periods. This data was obtained through an archive of questions that had been collected by the school's administrative staff. The dataset includes various types of questions related to the registration process, fees, facilities, as well as general information about the school. With the capacity of 2 administrative staff at SMK Insan Teknologi, based on table 2 above, there are 104 repetitive questions that must be answered within a limited time. Of course this causes a lack of efficiency in providing services to prospective students.

In addition, the process of the Prospective Learner administration system at SMK Insan Teknologi East Jakarta is still carried out manually, starting from filling out the registration form by prospective new students, asking questions about the academic process, and the process of entering academic scores. This process often experiences various problems such as data writing errors, difficulty in reading handwriting, longer time in making from

registration, proof of registration, and other completeness. With these various obstacles, the process of making and submitting reports on new prospective students causes significant delays in the process of determining prospective students. Not only that, the system used still relies on physical archives that are prone to damage and data loss.

One of the efforts to overcome the problems faced by SMK Insan Teknologi is to develop a chatbot by integrating with the website can be a very profitable option. A chatbot is an artificial intelligence-based system designed to interact with users via text or voice[3]. Chatbots can be used for a variety of purposes, ranging from customer service to automated information provision. This technology is increasingly popular due to its ability to work automatically, without the need for human intervention. based on the application of chatbots such as hotels [4], educational organisations [5], and interpretation[6].

In this study, researchers integrated a chatbot using Dialogflow with the Natural Language Processing (NLP) method. Natural Language Processing (NLP) provides a deep understanding of how chatbots and can dynamically provide responses by scanning and understanding keywords in human input [7]. The accuracy of the chatbot is influenced by the quality of the NLP model and the question data used, as well as the adjustments made based on the specific context at SMK Insan Teknologi.

With the chatbot, prospective students can interact with the system directly through conversation. This allows prospective learners to get information about the registration process at SMK InTek quickly and easily, without being limited by place or time.

A chatbot using NLP methods can automatically understand the questions asked by prospective learners and provide relevant and informative responses [8]. Thus, chatbots are not only a tool to speed up the admission process, but also improve the overall user experience.

Research related to chatbot systems was previously conducted by Rani Dan Fatchan, with the title 'Designing Chatbot Technology Applications for the Commercial Industry 4.0.' This research utilises the Term Frequency-Inverse Document Frequency (TF-IDF) technique to provide answers to questions with patterns that vary according to each category[9]. Whereas in this study researchers used NLP methods that have been integrated in Dialogflow, which are useful for understanding more natural question patterns when questions are issued. As well as the advantages of this research, namely including the use of Artificial Intelligence Chatbot using Dialogflow in addition, this research is not only for the information system for new student admissions, but also for the development of the academic system. This system was built using the Codeigniter 3 Framework because it has many object-oriented libraries.

The purpose of this research is to build a chatbot-based new student admission information system that uses the NLP method, so that it can be efficient and effective time in

helping to answer student questions without having to wait for responses from staff and to measure the accuracy of chatbots used at SMK Insan Teknologi East Jakarta.

II. METHODS

In this research, the system is built using the waterfall method while for text analysis of chatbots is carried out using the NLP method. The stages of this research can be seen in Figure 1.

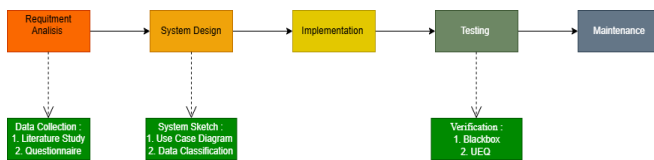


Figure 1: Flowchart of the research

A. System Design Method

In system design, it is a development model that uses the waterfall method, being one of the software development models in it. The process in the waterfall model is described as follows :

1) *Requirement Analysis.* At this stage, conduct Data Collection by means of literature review and questionnaires. Literature review is done to review relevant literature such as NLP methods, chatbots, dialogue flow, waterfall and other supporters. Meanwhile, interviews were conducted to collect data from 2 administrative staff, 2 parents of students who have registered, and 1 principal. Then, data processing of 104 repeated questions to be classified.

2) *System Designs.* This stage is a continuation of the stage after the needs analysis, namely designing the system using a usecase diagram. Usecase diagrams are used to describe the interaction relationship between users and the system [10].

3) *Implementation.* The next stage after system design; this is the stage where the system design is designed into an application programmer[11].

4) *Verification/Testing.* This stage conducts testing using UEQ and Blackbox testing to 20 website visitors and chatbot prospective learner information systems, the units that have been made are combined and tested. This is done to ascertain whether the chatbot created is in accordance with the design and can function properly. In addition, this is also to ascertain whether there are still errors in the system design [12].

5) *Maintenance.* The final stage of the waterfall model is maintenance. At this stage, the programme is in finished form, ready to run, and correct errors that were not found in the previous step [13].

B. Chatbot

A chatbot is a computer programmer that communicates with people via text or voice. Chatbots allow users to communicate with services or systems without interacting directly with humans[14]. Chatbots use natural language processing or NLP technology to understand user questions and commands. Chatbots use machine learning or artificial intelligence to improve their capabilities. Chatbots can be used for various functions, such as customer service, virtual assistant, information, and online transactions.

Chatbots have many advantages, such as providing an interactive user experience, processing multiple queries efficiently, and providing fast and consistent responses [15]. Chatbots can also improve operation efficiency, provide faster solutions for users, and work non-stop 24 hours a day. In the research of D. Damayanti and A. K. Nuzuli, Chatbot as a result of technological advances, has become one of the most innovative tools to improve interactions between humans and technology, improve customer service, and increase the efficiency of various communication and information processes [16].

C. Natural Language Process

One part of computer science related to artificial intelligence and language (linguistics), natural language processing (NLP) addresses how computers interact with natural human languages, such as English and Indonesian, as well as the ability to understand and interpret regional languages [16].

Human language processing (NLP) incorporates rule-based human language modelling using machine learning, deep learning, and statistics. With the help of these technologies, computers can process text or voice data and understand the full meaning, as well as the intent and feelings of the speaker or writer [17].

D. Dialogflow

Dialogflow is a platform created by Google to create chatbots that use machine learning [19]. Dialogflow agents read text and then provide appropriate responses. Dialogflow has several process components as follows:

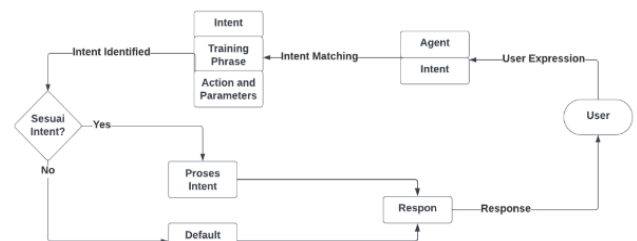


Figure 2: Dialogflow Process

In addition, this platform can be used in conjunction with various social media applications such as Line, Telegram,

Facebook, and so on. Dialogflow itself has some important aspects as follows:

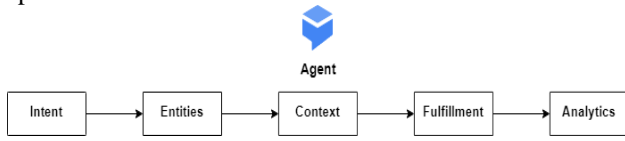


Figure 3. Dialogflow Model

As shown in Figure 3, the agent content in the dialogue flow has several aspects including:

1) *Intent*. Intent is the intention of what the user wants to say or do during discourse [18]. For example, when a user requests information about enrolment at SMK INTEK (Insan Teknologi), there is a specific intention to understand the information request.

2) *Entities*. Entities are entities that collect specialised information from discourse [19]. They are useful for identifying and extracting important information from user text. For example, when a user asks, "what is SMK InTek (Insan Teknologi)?", the word "SMK" will be used to indicate the object.

3) *Context*. Context in dialogue flow stores contextual information such as the topic being discussed or previous conversation steps to understand the next question or command from the user [20].

4) *Fulfillment*. Fulfillment is the integration of Dialogflow with external systems allowing the bot to handle complex user requests by retrieving or storing data from external sources such as databases or web services [21].

5) *Analyse*. Dialogflow provides statistical data on user interactions with the bot, including the number of conversations, most frequently triggered intent, and failures in comprehension, to assist developers in bot evaluation and improvement[22].

E. Blackbox

In the research, the Blackbox Testing method is used, where Blackbox Testing is a software testing technique that focuses on the functions and specifications of software usability. Through this test, testers can get a detailed understanding of the strengths and weaknesses in the system being tested so as to enable faster system improvements [23].

In this testing test, researchers also conducted accuracy tests on chatbots using the accuracy formula as follows [24].

$$Accuracy = \frac{Number\ of\ questions\ right}{Number\ of\ question\ frequency} \times 100\% \tag{1}$$

F. User Experience Questionnaire (UEQ)

User Experience Questionnaire (UEQ) is a questionnaire that serves as a tool to measure the level of user experience on a system or product, which provides a quick and efficient evaluation.

	1	2	3	4	5	6	7		
menyusahkan	○	○	○	○	○	○	○	menyenangkan	1
tak dapat dipahami	○	○	○	○	○	○	○	dapat dipahami	2
kreatif	○	○	○	○	○	○	○	monoton	3
mudah dipelajari	○	○	○	○	○	○	○	sulit dipelajari	4
bermanfaat	○	○	○	○	○	○	○	kurang bermanfaat	5
membosankan	○	○	○	○	○	○	○	mengasyikkan	6
tidak menarik	○	○	○	○	○	○	○	menarik	7
tak dapat diprediksi	○	○	○	○	○	○	○	dapat diprediksi	8
cepat	○	○	○	○	○	○	○	lambat	9
berdaya cipta	○	○	○	○	○	○	○	konvensional	10
menghalangi	○	○	○	○	○	○	○	mendukung	11
baik	○	○	○	○	○	○	○	buruk	12
rumit	○	○	○	○	○	○	○	sederhana	13
tidak disukai	○	○	○	○	○	○	○	menggembirakan	14
lazim	○	○	○	○	○	○	○	terdepan	15
tidak nyaman	○	○	○	○	○	○	○	nyaman	16
aman	○	○	○	○	○	○	○	tidak aman	17
memotivasi	○	○	○	○	○	○	○	tidak memotivasi	18
memenuhi ekspektasi	○	○	○	○	○	○	○	tidak memenuhi ekspektasi	19
tidak efisien	○	○	○	○	○	○	○	efisien	20
jelas	○	○	○	○	○	○	○	membingungkan	21
tidak praktis	○	○	○	○	○	○	○	praktis	22
terorganisasi	○	○	○	○	○	○	○	berantakan	23
atraktif	○	○	○	○	○	○	○	tidak atraktif	24
ramah pengguna	○	○	○	○	○	○	○	tidak ramah pengguna	25
konservatif	○	○	○	○	○	○	○	inovatif	26

Figure 4. Questions on UEQ Testing

UEQ is designed to measure user experience through three main categories: pragmatic, hedonic, and attractiveness aspects. The three categories of aspects have six aspects that are measured, namely attractiveness, efficiency, perspicuity, dependability, stimulation, and novelty[25].The researcher will distribute a questionnaire containing questions about UEQ testing on chatbots, these questions are as shown fig 4.

III. RESULT AND DISCUSSION

A. Requirement Analysis

In this step, the researcher collected data with quantitative methods, using literature study interviews and existing documentation at SMK Insan Teknologi. At this stage, the researcher reviews previous research, as well as learning design models and formative evaluation implementations that have been proposed or used previously.

Several categories of question data that will be used for data instruction in the chatbot system were created based on the results of documented observations and interviews that have been conducted. These categories include school profile, tuition fee, PPDB schedule, how to register, brochure request, and selection result announcement. In addition, the data needed is internal data contained as in table II, the table is a question that often appears before at InTek Vocational School.

B. Chatbot System Design

There are 2 actors who interact with the system in this case, namely: (User), namely Prospective Students of Insan Teknologi and PPDB Committee (Admin). Prospective Students can start a conversation to view registration information, make online registration, and the payment menu. Admins can make system settings such as creating new topics, deleting new classifications, and adding new descriptions.

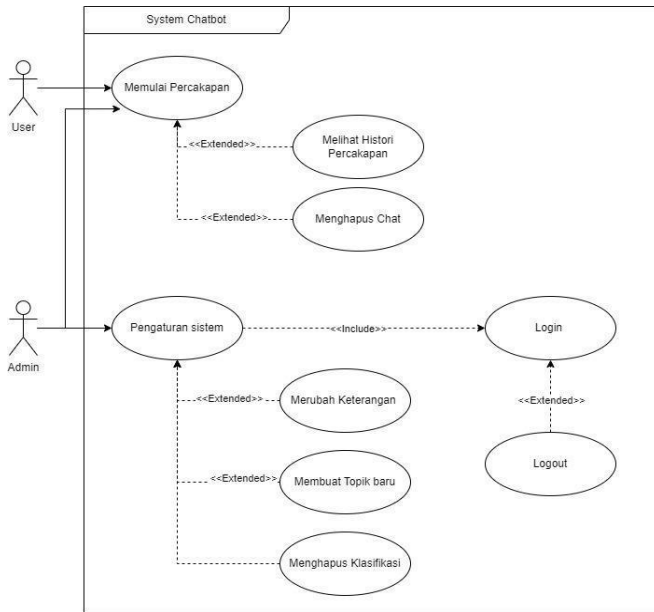


Figure 5. Mobile System Use Case on chatbot

C. Chatbot Data Classification

Chatbots sometimes have difficulty in processing complex or ambiguous questions[24]. Questions with multiple topics or long sentences can lead to errors in understanding the user's intent. For example, questions such as ‘What is the application process and are there scholarships for certain majors?’ can trigger confusion in mapping the right context, resulting in inappropriate responses. Therefore, the data must be classified first, which refers to the internal data set as Table II, there are several data modelling that will be done by training:

TABLE III
CLASSIFICATION OF DATA CHATBOT

No	Training Phrase	Classification
1	info ppdb	Introduction
2	selamat sore	Introduction
3	selamat pagi	Introduction
4	selamat siang	Introduction
5	Assalamualaikum	Introduction
6	salam	Introduction
7	informasi ppdb	Introduction
8	tentang ppdb	Introduction
9	tentang sekolah	Profil
10	profil sekolah	Profil

11	minta profil jurusan	Profil
12	profil	Profil
13	mengenai sekolah	Profil
14	alamat sekolah	Profil
15	jadwal ppdb	Jadwal
16	waktu ppdb	Jadwal
17	apa ppdb sudah dibuka jadwal	Jadwal
18	kapan di buka ppdb	Jadwal
19	kapan dibuka	Jadwal
20	tanggal berapa dibukanya	Jadwal
21	tanggal berapa ditutupnya	Jadwal
22	kapan ditutup penerimaan	Jadwal
23	kapan dimulai pendaftaran	Jadwal
24	mulai pendaftaran	Pendaftaran
25	cara pendaftaran ppdb	Pendaftaran
26	cara mendaftar ppdb	Pendaftaran
27	cara daftar ppdb	Pendaftaran
28	cara daftar	Pendaftaran
29	bagaimana cara melakukan pendaftarannya	Pendaftaran
30	biaya masuk	Keuangan
31	untuk pembiayaannya berapa	Keuangan
32	berapa biaya masuknya	Keuangan
33	total seluruh biaya masuk	Keuangan
34	nominal biayanya berapa	Keuangan
35	rincian biaya	Keuangan
36	ada berapa jurusan	Jurusan
37	apa saja jurusannya	Jurusan
38	apa saja kompetensi keahlian	Jurusan
39	apa saja program keahlian	Jurusan

In Table III there are 5 classifications consisting of introduction as many as 8 training phrases, profile as many as 6 training phrases, schedule as many as 9 training phrases, registration as many as 6 training phrases, finance as many as 6 training phrases and majors as many as 4 training phrases. The results of the data modelling training showed several question requests and their answers, as shown in Table IV.

TABLE IV
REQUEST RESULTS AND CHATBOT RESPONSE

Request	Response
Pembuka	<ul style="list-style-type: none"> • Selamat datang di portal pendaftaran PPDB SMK Insan Teknologi! Saya adalah asisten virtual yang tersedia untuk membantu Anda melalui proses pendaftaran. Jangan ragu untuk bertanya jika Anda memerlukan panduan atau bantuan. a) Halo! Terima kasih telah mengunjungi portal pendaftaran PPDB SMK Insan Teknologi. Saya siap membantu Anda dengan proses pendaftaran. Apakah ada yang ingin Anda tanyakan atau butuh bantuan? b) Selamat datang! Saya adalah asisten virtual dalam portal pendaftaran PPDB SMK Insan Teknologi. Mari kita mulai proses pendaftaran dengan lancar. Jika Anda memiliki pertanyaan atau perlu bantuan, jangan sungkan untuk menghubungi saya. c) Halo, apa kabar? Saya siap memberikan bantuan dalam pendaftaran PPDB SMK Insan Teknologi melalui portal ini. Silakan

	d) jelajahi opsi pendaftaran dan beri tahu saya jika Anda memerlukan bantuan lebih lanjut. Selamat datang di portal pendaftaran PPDB SMK Insan Teknologi! Saya adalah asisten virtual Anda di sini untuk memandu Anda melalui setiap langkah proses pendaftaran. Jika ada yang perlu Anda tanyakan atau klarifikasi, jangan ragu untuk menghubungi saya.
Pendaftaran	CARA PENDAFTARAN Pendaftaran bisa melalui: Kantor Sekretariat SMK Insan Teknologi atau Website sekolah http://ppdb.smkInTek.sch
Keuangan	Untuk Nominal Biaya Masuk di SMK Insan Teknologi Cibubur Jakarta Timur sebesar Rp. 2.635.000, dan bisa diangsur maksimal 2 kali angsuran Berikut Rincian Biaya : . Uang Masuk ✓ SPP Bulan Juli 2024 : 350.000 ✓ Seleksi Masuk dan MOS (Masa Orientasi Siswa): 150.000 ✓ Formulir Sekolah: 100.000 a. Rincian Seragam ✓ Baju Olahraga : 160.000 ✓ Baju Batik : 125.000 ✓ Baju Praktek : 250.000 b. Rincian Uang Kegiatan ✓ OSIS 1 Tahun : 200.000 ✓ Praktek 1 Tahun : 600.000 ✓ Sarana Pendidikan : 700.000 (Bagi Alumni MTS Insan Kamil Bebas Uang Gedung atau Sarana Pendidikan) D Total Biaya SMK Insan Teknologi Rp. 2.635.000.
Jurusan	<ul style="list-style-type: none"> • Jurusan Kompetensi Keahlian Teknik Kendaraan Ringan Otomotif. • Jurusan Kompetensi Keahlian Teknik Komputer dan Jaringan.

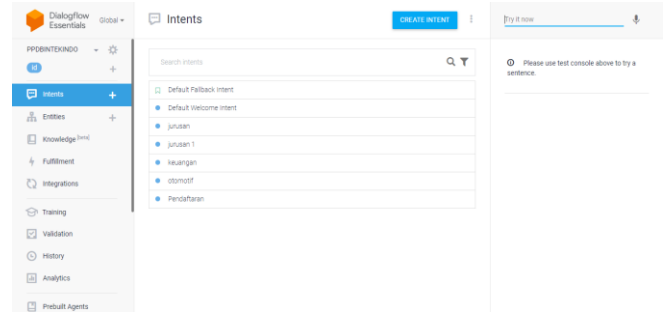


Figure 6. Dialogflow Intent Generation

Basically the purpose of Intent is to help the system understand the intent or purpose of the words spoken by the user. Intent allows developers to design richer and more responsive interactive experiences by mapping the intent or purpose of different users. the following is a sampling of intent data:

a. Initial Intent

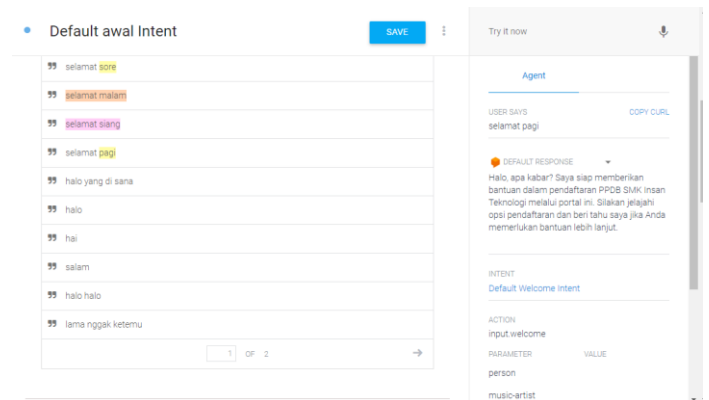


Figure 7. Question Generation Display

In table IV explains the results of the response and what is given after going through training data. and there are 5 request which each have different output results.

D. Implementasi

Based on the design that has been made, a web-based information system is built to manage PPDB at SMK Insan Teknologi. Chatbot creation uses Dialogflow as its framework. Chatbot will also be integrated into the website after its creation in Dialogflow. Here is how it looks like:

1) Implementation of DialogFlow

This webpage is the main menu page of calcification on DialogueFlow. The figure 6 above explains about the Intent in Dialogflow. Intent is used to determine the response or action that the Chatbot should take based on specific user input.

The figure 7 above describes the beginning of a conversation or greeting to a chatbot whose word selection is in accordance with the user.

b. Intent fallback

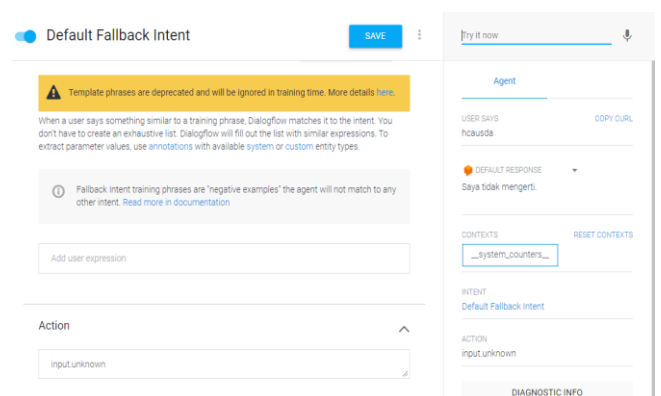


Figure 8. Display of the response given

The figure 8 illustrates the process in which a user provides a response that doesn't align with any predefined intent, making it unclear to the bot. As a result, the bot sends an error message or a notification indicating that the input wasn't understood.

c. School Profile Intent

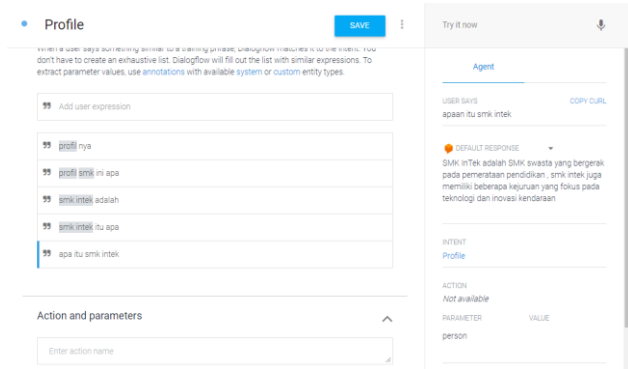


Figure 9. Display of the response given

The figure 9 above explains one of the intent, namely the profile that will be used in this research bot to understand or recognise questions that will be asked by users. For example: want to ask about information on the school profile.

d. School Department Intent

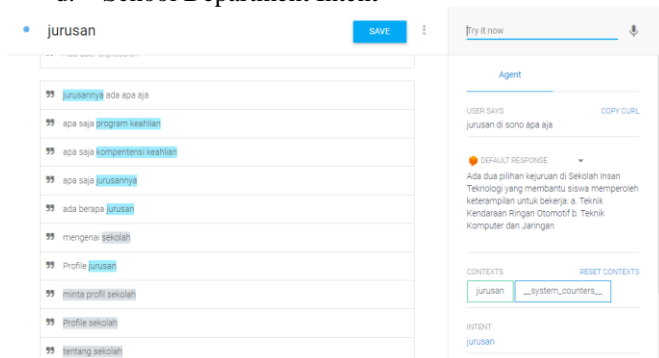


Figure 10. Display of the response given

In figure 10 explains one of the intents, specifically "school vocational," which will be used by the research bot to recognize and understand user questions. For instance, when a user inquires about the school's vocational programs.

2) Chatbot Implementation

This figure 11 above is the implementation of Chatbot through a website platform. When the user starts using the Chatbot, the user can press the button to say the opening sentence then the Chatbot responds with an opening greeting. Users can enter questions about SMK InTek school registration and Chatbot will issue a response in the form of answers to these questions.



Figure 11. Display of Chatbot Results

The chatbot will issue a specific response if the user enters a question that cannot be answered by the chatbot.

E. Testing

In this testing, researchers conducted 2 tests using Blackbox and UEQ (User Experience Questionnaire) in order to ensure how accurate and functional the chatbot system is.

1) Blackbox testing on Chatbot

This test aims to measure the functional system on the chatbot from the message sent based on the scenario, using the blackbox test as shown in table V.

TABLE V
BLACKBOX PATTERNLESS REQUEST TESTING

No	Scenario Testing	Input	Expected Output	Result Realisation
1	Creating an opening sentence	Assalamuali akum	Display the default wellcome Intent	Success
2	Enquire about registrants	Gimana cara daftarnya	Displaying the registration type	Success
3	Enquire about financing	Berapa biaya pendidikannya	Displaying Finance Charges	Success
4	Inquire about vocational education	Ada berapa kejuruan disana	Showcasing education programmes	Success
5	Randomised input	Apakah bumi datar	Display the default fallback intent	Success
6	Input mistyped	Intekad	Display the school profile	Failed
7	Ask for the school profile	Apa itu Insan Teknologi	Display the school profile	Success
8	Enquire about the school enrolment schedule	Kapan pendaftaran di buka	Display the registration time	Success

The results of testing the Black-box testing method on the Chatbot information for prospective SMK InTek participants show that the 8 scenarios in the test got 7 appropriate scenarios and 1 scenario was not appropriate, so that 87.5% accuracy was obtained. Calculation of accuracy can be seen in the formula below.

$$Accuracy = \frac{7}{8} \times 100\%$$

$$Accuracy = 87,5\%$$

2) *User Experience Questionnaire Testing on Chatbot*

Furthermore, the chatbot was tested again with the UEQ method. In this test, 20 respondents filled out a questionnaire on a google form to test and evaluate the level of user experience. From the results of the average value of the UEQ questionnaire scale for this administrative service chatbot, the value is obtained as in the following table VI.

TABLE VI
UEQ SCALES TESTING TABLE

UEQ Scales (Mean and Variance)			
1	Attractiveness	1,650	0,75
2	Clarity	1,738	0,46
3	Efficiency	1,975	0,35
4	Accuracy	1,638	1,22
5	Stimulation	1,913	0,42
6	Novelty	1,525	0,94

In table VI shows that the Mean value in the EUQ test results is above 1.75, which means that the user good on the administrative service chatbot is at a positive level indicated by a green arrow indicating that the mean value has increased positively. The results of the Highest Mean Value are on the stimulation scale of 1.975, then followed by the attractiveness scale of 1.650, while the clarity scale is 1.738, efficiency is 1.975, and novelty has increased the mean value by 1.525.

TABEL VII
COMPARISON UEQ PADA CHATBOT

Scale	Mean	Comparison to benchmark	Interpretation
Attractiveness	1,65	Good	10% of results better, 75% of results worse
Clarity	1,74	Good	10% of results better, 75% of results worse
Efficiency	1,98	Excellent	In the range of the 10% best results
Accuracy	1,64	Good	10% of results better, 75% of results worse
Stimulation	1,91	Excellent	In the range of the 10% best results
Novelty	1,53	Good	10% of results better, 75% of results worse

In table VII, from the results of the overall value which is the benchmark for this administrative service chatbot, it is at an extraordinary level, namely at the good level of the scale obtained.

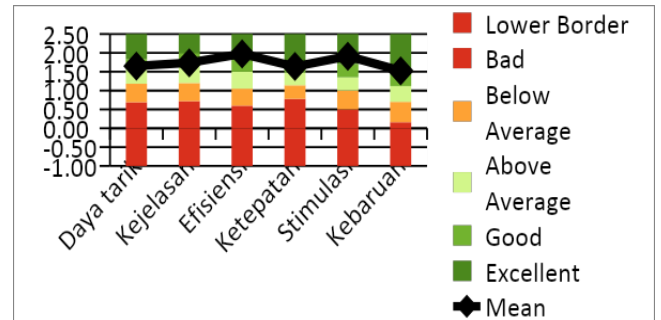


Figure 12. UEQ Chatbot Result View

In the benchmark results above, the test results obtained an attractiveness value of 1.65, a clarity value of 1.73, an efficiency value of 1.97, an accuracy value of 1.63, stimulation value of 1.93, and novelty value of 1.52. From the benchmark results, the measurement results obtained good results on the values of attractiveness, efficiency, stimulation, novelty, and obtained above average scores for the values of clarity and accuracy. Overall, these results show that the model operates with excellent performance, especially in detecting positive objects with a low error rate.

IV. CONCLUSIONS

Based on the results of this research, several important points can be concluded regarding the implementation and test results of the information system at SMK Insan Teknologi. First, the analysis of the old system allowed researchers to identify the functional needs of the student data processing system. Functional requirements include online student registration information, and school announcements. System implementation was made using the NLP method on Chatbot in order to help PPDB at SMK Insan Teknologi.

Second, the chatbot information system at SMK Insan Teknologi was tested using blackbox and UEQ methods. The test results show that all features run as expected, signalling that this system is ready to be installed and used. In addition, the design of the chatbot system on the website built using Dialogflow is very helpful in the process of admitting new students. This chatbot uses a natural language processing model that is able to process sentences or words requested and produce responses with an accuracy rate of 87.5% with black box and good level on UEQ.

Through the implementation of a chatbot, the admission system can provide fast, accurate and relevant responses to user queries and recommendations for applicants. This chatbot integration improves service quality and reduces response time, allowing administrative staff to focus on more complex tasks while the chatbot handles basic queries.

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