

## Milestone 2

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Don't Change the Font, Spacing and Layout of the template. You can Use more space then provided, but not less.

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Project Title: Chatbot - Respond to queries and book appointments using NLP and Deep learning.

### Data Details

Source of Data/Size of Data/No. of Records/ Variety/ Authenticity of Data Etc. (2 Marks)

We have made sample chat transcripts which comprise of series of user's input and Chabot's response to user and prompting the user to their desired output. There are around 10 chat transcripts which can be used to check the flow of a chat and working of the chatbot for the required operation and function.

Sample Chat dialog flow:

- User: Hi/hello/hey etc.
- Chatbot: "Hello! My name is Deep, and I am the virtual assistant of Doctor's reception. Would you like to book/cancel an appointment or ask any question/queries with doctor?"
- User: "mmmmmmmmmm".....
- Chatbot: "I could not understand what you said can you please repeat it?"
- User: "book an appointment"
- Chatbot: "So you would like to set an appointment"
- User: "Yes /Agreed/ No"
- Chatbot: "what date?"
- User: "19 September"
- Chatbot: "what time?"
- User: "10 AM"
- Chatbot: "I would like to confirm your appointment for 19 September at 10 AM. Please confirm?"
- User: "Yes/Sure"
- Chatbot: "Appointment set Successfully. Please visit on 19 September at 10 AM."

## Milestone 2

Similarly, multiple data have been created to train and test the chatbot to perform all its features such as booking and cancelling an appointment, resolving customer's queries and testing all these functionalities.

### User Interface Design

Salient Points/ How it meets the characteristics of User Centered Design etc. (2 Mark)

(At least 150 words and at least 4 figures of the User interface or other related figures of your project)

The chatbot is being created on Dialogflow which is powered by Google and can be accessed from the web link <https://bot.dialogflow.com/4c05cff4-4544-4351-874d-5d3e3eb17c65>. The user interface of the website is simple. User can type/speak on their devices through microphone to interact with the chat bot. Also, it is integrated with Google assistant. So, millions of devices can access our chatbot just by saying "OK Google, talk to Doc Receptionist" and the chat bot is right there in your service. The chat bot greets you with all the features and functionalities it can perform and assists if the user is not able to type correctly or use the Chabot's functionality. Customer can also use the chatbot through phone by calling. This feature would allow even non-technical and poor people who don't have access to smartphones to use the chatbot easily just by calling. All requirements of User Centered Design and User Interface are taken by integrations of Google using Google Assistant, Web Demo, DialogFlow Phone Gateway and Twilio. Screenshots of website, google integration platform, and google dialog flow is attached below.

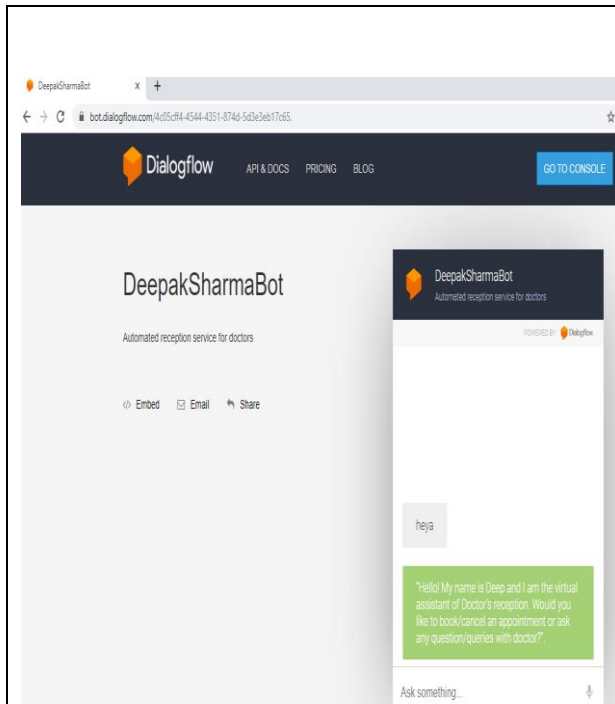


Fig1 of User interface on web

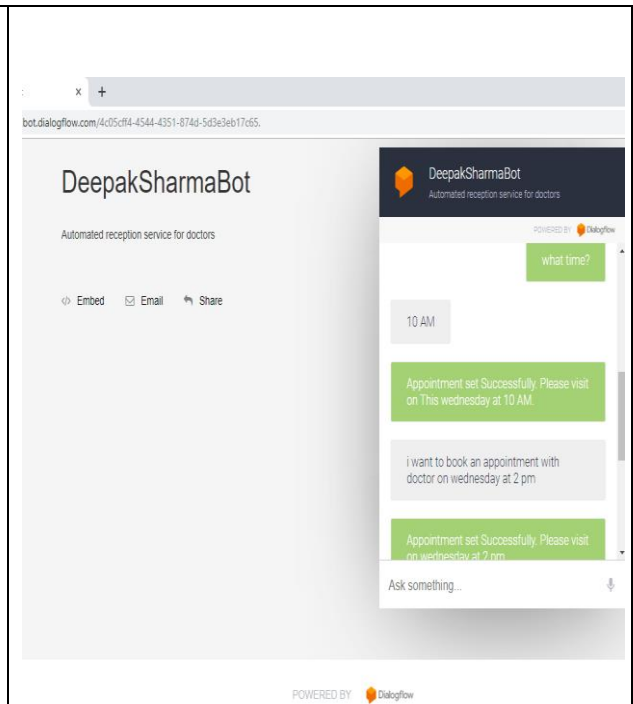


Fig2 of User interface of web continued

## Milestone 2

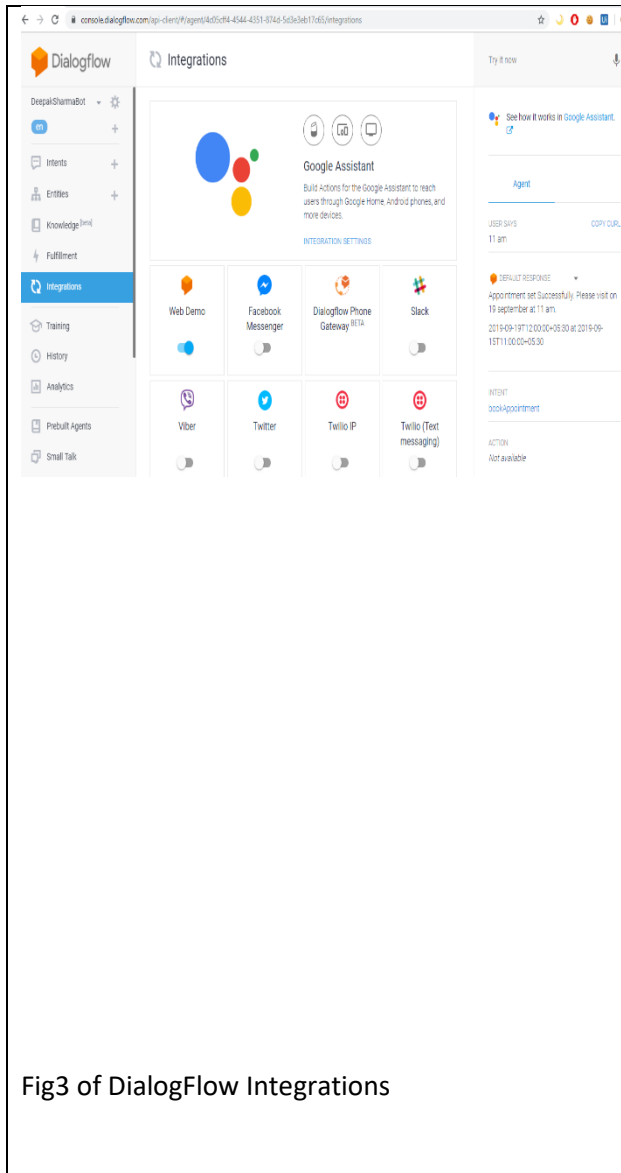


Fig3 of DialogFlow Integrations

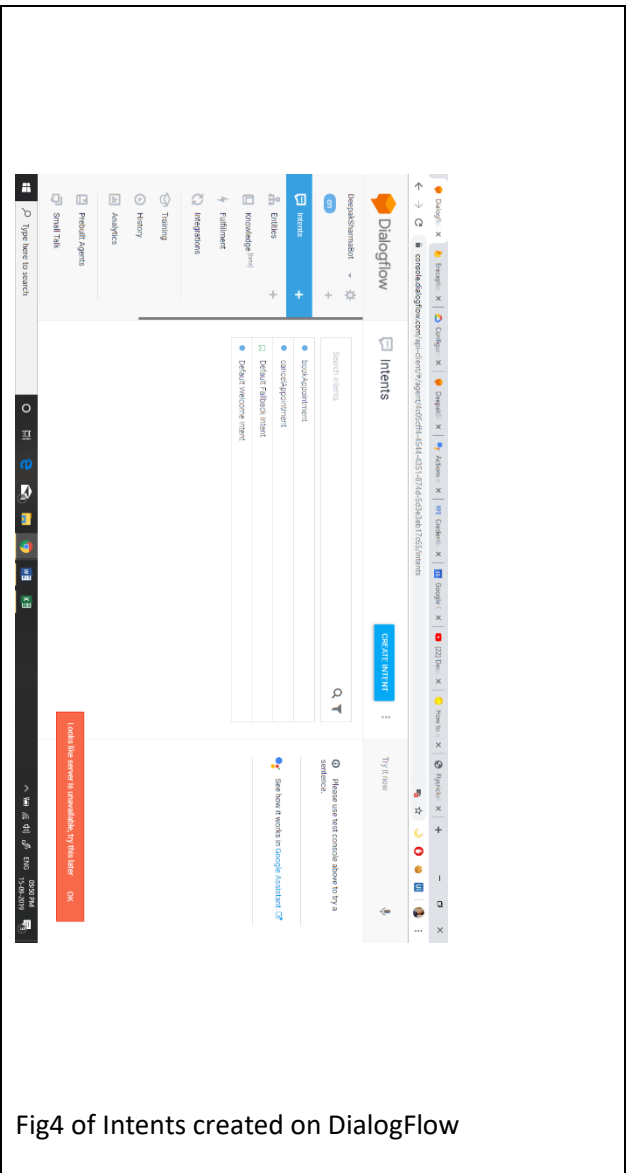


Fig4 of Intents created on DialogFlow

### User Surveys (1 Mark) (At least 50 words for each feedback)

Potential User 1 Feedback: "I would most probably use this application on my mobile phone as it is more convenient, easy and handier to use on our smartphones. This same application can also be used in places where appointments and bookings work such as hotels, banks, schools or even restaurants with a long waiting queue."

Potential User 2 Feedback: "I would like to use this application also to book ambulance as the ambulance booking system is very slow which creates a lot of problems for people during emergency. This chatbot can assist in emergency booking system which would be great for us as users since we can have a single platform to resolve our issues."

Potential User 3 Feedback: "This can be used at every workstation where public dealing is done. In fact, every CRM has a software requirement to interact with customers in order to resolve their

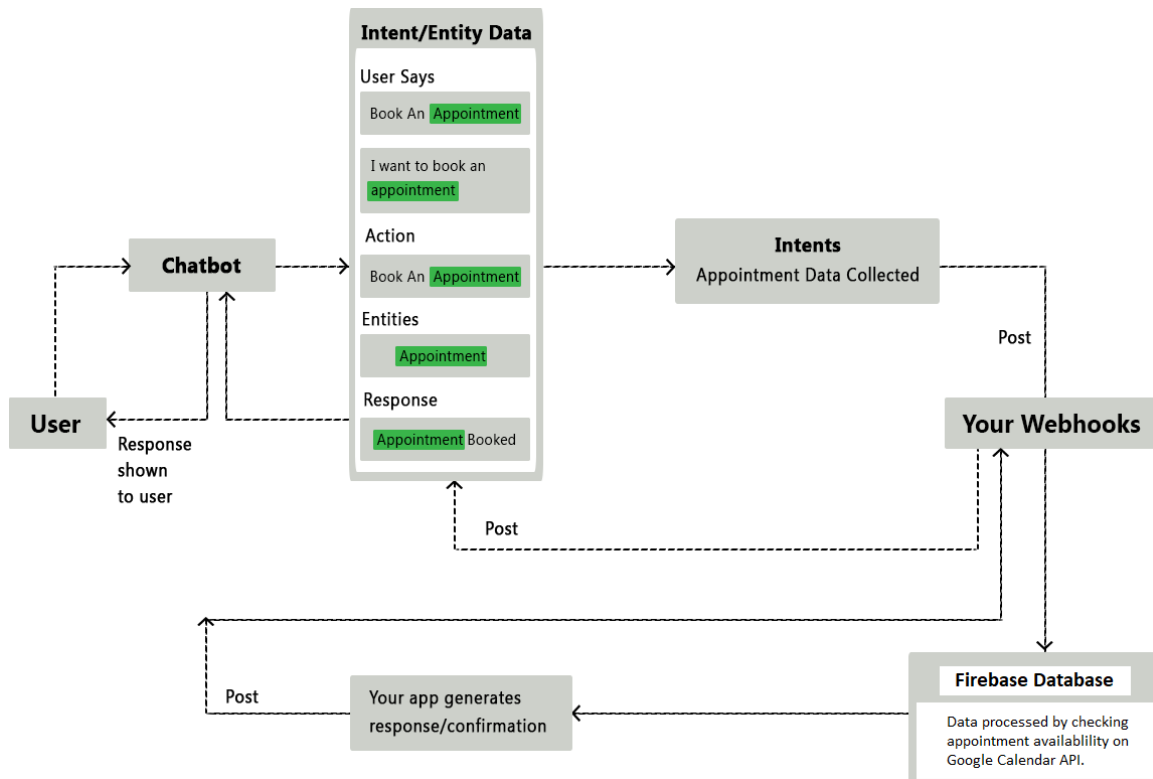
## Milestone 2

questions/queries, get feedback, help in assisting etc. Hence this chat bot can be integrated in any workplace/website of companies/organizations where customer feedback/response is needed.”

Potential User 4 Feedback: “Yes, I'll use this application. Through this app I can ensure proper appointments. I will be using this application for setting an appointment or for any of my queries. If the time of appointment requested by me is not available, then this app should suggest me a feasible time for appointment.”

Potential User 5 Feedback: “I think the feature of the app that lets you ask questions/queries to doctors and gives you their response is amazing. Many times, we get ill but visiting a doctor to get their advice becomes a tedious task for small health related problems. I think through this feature our small questions regarding our health and life can be solved easily and effectively by doctors which would be a great thing.”

Design Documents (Overall Block Diagram/ Data Flow Diagram/ Architecture Diagram/ Solution Diagram, UML Diagram etc.) (As Applicable) (3 Marks)



DATA FLOW DIAGRAM

Ethical and legal/privacy/terms and conditions (3 Marks)

(At least 500 Words)

Actual Text of such issues that will be put before the user to agree

## Privacy Policy

Deepak Sharma of Bennett University manufactured the Doc Receptionist application as an Open Source application based on DialogFlow powered by Google. This SERVICE is given by Deepak Sharma of Bennett University at no expense and is planned for use as it stands.

This page is utilized to illuminate visitors and users regarding my approaches with the gathering, use, and disclosure of Personal Information if anybody chose to utilize my Service.

If you agree to utilize my Service, at that point you consent to the gathering and utilization of data in connection to this approach. The Personal Information that I gather is utilized for providing and improving the Service. I won't utilize, share or impart your data to anybody aside from as depicted in this Privacy Policy.

### Information Collection and Use

For a superior experience, while utilizing our Service, I may expect you to furnish us with certain personally identifiable data, including however not restricted to Name, contact, address, questions/inquiry, appointment details. The data that I solicit will be held on your gadget and isn't gathered by me in any capacity.

The application uses outsider administrations of third-party services that may gather data used to distinguish you.

Link to privacy policy of outsider specialist third party organizations utilized by the application:

<https://dialogflow.com/terms>

<https://developers.google.com/terms>

<https://firebase.google.com/terms>

### Cookies

This Service doesn't utilize these "cookies" expressly. Be that as it may, the application may utilize outsider code and libraries that uses "cookies" to gather data and improve their administrations. You have the alternative to either acknowledge or deny these cookies and know when a cookie is being sent to your gadget. In the event that you reject our cookies, you will most likely be unable to utilize a few segments of this Service.

### Service Providers

I may utilize outsider organizations and people because of the accompanying reasons:

- To encourage our Service,
- To give the Service for our benefit,

- To perform Service-related services, or
- To help us in examining how our Service is utilized.

I need to educate clients regarding this Service these outsiders approach your Personal Information. The reason is to play out the undertakings doled out to them for our sake. In any case, they are committed not to uncover or utilize the data for some other reason.

## Terms and conditions

By downloading or utilizing the application, these terms will consequently concern you – you should ensure in this way that you read them cautiously before utilizing the application. You're not permitted to duplicate, or adjust the application, any piece of the application, or our trademarks in any capacity. You're not permitted to endeavor to copy the source code of the application, and you likewise shouldn't attempt to make an interpretation of the application into different dialects or make subordinate variants. The application itself, and all the exchange marks, copyright, database rights and other protected innovation rights identified with, regardless it has a place with Deepak Sharma of Bennett University.

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As for Deepak Sharma of Bennett University's duty regarding your utilization of the application, when you're utilizing the application, it's essential to hold up under as a top priority that in spite of the fact that we attempt to guarantee that it is refreshed and right consistently, we do depend on outsiders to give data to us with the goal Deepak Sharma of Bennett University acknowledges no obligation for any misfortune, immediate or roundabout, you experience because of depending completely on this usefulness of the application.

### Changes to This Terms and Conditions

I may refresh our Terms and Conditions now and again. Hence, you are advised to survey this page occasionally for any changes. I will inform you of any progressions by posting the new Terms and Conditions on this page. These progressions are taking effect right now after they are posted on this page.

### Get in touch with Us

If you have any inquiries or proposals about my Terms and Conditions, don't stop for a second to get in touch with me at [ereceptionbot@gmail.com](mailto:ereceptionbot@gmail.com).

feasibility study/ Business Context of the idea/ Monetization/ Opportunity Analysis (2 Marks)

(At least 250 Words)

Since this chatbot is being created for doctors and their patients so as to provide easy appointment booking and query resolving solution, it can be used in any professional sectors which are related to healthcare and lifestyle. Public health sectors such as Hospitals & Government clinics, private Hospitals, private clinics and even veterinary clinics can use my customizable chatbot to assist customers in booking/rescheduling appointments and resolving their issues. I can charge the government/private organizations accordingly to provide my service and provide support to my software. Also, I can use third-party advertisements on my chatbot website and application to generate revenue.

Chatbot can be used on any website and by any organization dealing with customer relationship management to support their customer's queries and schedule appointment or help customer in any assistance. My project can be used to provide these types of business support using automated BPO service. Companies/organizations can be charged and monetized to provide these services using my chat bot. Depending on the type of service and number of services, companies could be charged accordingly. Also, even if I'm releasing the free version of my software, I'd use ad-services to generate revenue and provide ad-free premium membership so as to create value and money from my application.

Thus, my appointment scheduling and query resolving chatbot is feasible in multi-disciplinary and domain industries which would provide me opportunity to get my idea implemented into the industry and, I would also be able to generate revenue and value out of my chatbot.

## Milestone 2

- Partial Implementation/ Draft Code ( 3 Marks)

Give Link of GitHub or any other public Repository/ Web Link where your partial code is available to see

[https://github.com/DeepHardy/DocReceptionist\\_ChatBot](https://github.com/DeepHardy/DocReceptionist_ChatBot)

Week wise Updates/ Diary/ Proportional achievement of stated outcomes/ Graded Functionality etc. (2 Mark)

(At least 100 words in each week)

### Week 1

As it was the first week after the holidays, and although I knew about the capstone project my focus was on completing my internship which was still going on and got finished a week after the university opened. Also, after coming back I got to know that the students have to make a report about the work that we did in our internship along with a video which had to be uploaded on YouTube. All of this took a lot of time to complete. At the end of the week me and my team went to our internship organization to submit the completed project.

### Week 2

In the second week after completing my internship I started searching for the different ideas for my capstone project. This was a difficult process because I wanted to do something which will not only impress the panel of judges coming from the industry but also which will be useful to people in their everyday life. To search for this kind of project I started searching online first but was not able to find anything but after taking with my teachers I was able to get ideas, about the types of project which are counted as capstone projects in the industry and what their actual scope should be like.

### Week 3

First, I was working on the idea of information extraction of legal documents using NLP with Professor Sridhar Swaminathan. I created my milestone 1 on it. But later when Professor K. K. Biswas floated the idea of chatbot on Amazon Lex/Google DialogFlow, the project sounded more feasible, interesting and something I had not worked upon previously. Hence, I started working on the research work and also focused to complete and start working on milestone 1. I was able to complete my milestone 1 along with my placement process, written tests and interviews but I was not able to start developing my project code.



## Milestone 2

### Week 4

In the third week I had got the idea of chatbot with the help of my Teacher Mr K. K. Biswas. This was not a new idea but the implementation of chatbot is quite complex and needs a lot of time. As I have never worked on this kind of project before, I started researching on different ways to implement chatbot and how to make the data for its training. With the help of my faculty mentor I was able to find an environment in which I can start working for my chatbot which was DialogFlow by Google. And then I started working on it.

### Week 5

As the placement drive started, so I started practicing for that also along with developing my chatbot. At the end of this I also had to submit my document for the milestone 1 which was quite big and had to do some research work for finding the different ways that people had done similar chatbot. While completing the milestone 1 document I got to understand the different ways that I can improve my idea of my current project. Completing the document too all the days in the week along with the placement drive class, which was mandatory, so the progress was quite slow on this week.

### Week 6

This week was most hectic with respect to the placement process. I had tests and interviews every other day. But I was able to manage and understand the working of Dialog Flow and how to integrate it with other applications like Google Assistant, Twilio etc. Although, I had less time dedicated for the project, I was able to get familiarized with the environment. I also watched a lot of tutorials and videos to get the understanding. With this relatively new technology, I was able to grasp hold of it. Hence, I started working thereafter on the deployment of my functionalities and features.

### Week 7

In week 7 I was primarily focusing on implementing the following features in my project I. One of which was "book appointment" feature. This feature is necessary in chatbot as it automates the system so that the user of the application would not have to go through the entire process to book an appointment instead, he could just message the chat bot for booking an appointment. Apart from that, I also had to implement Google calendar API for booking an appointment. Google calendar API was necessary as to fix a date for the appointment so that the user would not have to manually enter the date rather, he could just simply say something like this "book an appointment for 4th July 2019 for consulting a doctor."

## Milestone 2

### Week 8

In the week 8 which is also the current week, my main area of focus is to complete my project till that point where I can show a demo prototype of my project. It is because I also need to do documentation for my project where I need to show some screenshots of the working prototype. the documentation is also necessary as it would keep a record for the progress of my project and in future if I want to continue or implement something more on this project then the documentation would not only help me to get the current status of my project or to know how my project was implemented but it would also help others who are using my project to know the entire process and working of the chatbot.

## Milestone 2

Week Wise Plan for the remaining time to complete the Project (2 Mark)

### Week 9

After completion of my milestone 2, I would train my chatbot even more as the data on which my chatbot is trained is very less. I would explore more on internet and read some more research papers on how the chatbot really works. this way I would be able to add more cases on chatbot so that it works on all the possible scenario. Once the chatbot will be trained for multiple scenarios I will recheck on whether I missed any scenario or not. Once that is done, I will send all my explored scenarios to my faculty mentor for the final review.

### Week 10

Once I explore all the possible scenarios the next stage will be the implementation. The implementation would be lengthy or long process has the training for each scenario requires time. It is lengthy process because along with the training I must check whether my chatbot is performing correctly or not. It is necessary because once the initial implementation has changed there is no guarantee that the chatbot is working the way it's supposed to be. Parallely, I will have to ensure that it there are no bugs and errors in the chatbot which also requires to check whether any scenario is overlapping or cross matching.

### Week 11

In the week 11 of my project I will devote most of my time in white box testing as the code itself needs to be optimized and errors or bugs free. the optimization of code is required as my chatbot needs to work in real time. Since there are multiple scenarios so there can be possibility of redundancy that is the bot is giving multiple outputs which are irrelevant to the question that is asked to the bot. To avoid any such errors white box testing is necessary also to optimize my code and enhance the performance of the chatbot I will have to ensure that there are no useless loops in the system which is increasing the time complexity.

### Week 12

During the last week of my project I would mainly focus on black box testing that is I will randomly give my chat bot to those people who do not have any idea about the implementation and ask them to use the chatbot and whatever way they feel like. Once they operate the chatbot in their own way they can tell me the errors that might occur during the beta testing of the chat bot or they can tell me about the scenarios where my chatbot could be enhanced. After the beta testing of my project I will again review the entire process myself and check for any last-minute bugs or errors in the system. And submit my project for the final evaluation.

## Milestone 2

One Impressive Post on LinkedIn regarding your Project (2 Marks)

(At least 100 words and one Image and 5 hashtags, Tag at least CSE Bennett handle)

[https://www.linkedin.com/posts/deepaksharma18-06\\_capstone-csebennett-google-activity-6578965486783041536-xYBA](https://www.linkedin.com/posts/deepaksharma18-06_capstone-csebennett-google-activity-6578965486783041536-xYBA)

Discuss your Project with at least three students of your junior batches of Bennett University and ask them how they rate your project from 1 to 10 scale. Write all three name, Roll No, email and Mobile No of those students. They should be ready to confirm if they are called on their mobile number (1+1+1 for each of three students)

Simran Jha - LA18MC080

Email: SJ8975@bennett.edu.in

Contact: 8929019953

The bot needs to send the message quickly and should not keep the customer waiting. The idea is a good and a unique one, if executed properly, can help a lot of people in an emergency. Time saving helpful and well thought project.

Apoorva Kashyap - LA19MCE031

Email: LA19MCE031@bennett.edu.in

Contact: 7903188678

This project idea is very good as most of the people are fed up of long queues. If there is a case of emergency, then it's very difficult to stand in queues and wait I think this project will help improve this situation. This is a helpful idea to implement.

Ayushi Bisht - LA18MC019

Email: ayushibisht19.ab@gmail.com

Contact: 8393950924

I like the idea as it will create health consciousness among the people. People will get the appointments easily and they won't need to wait in lines for the doctors. Many people don't go for regular checkup due to the problem of appointments. Also, people get their general queries resolved easily.

(At least 50 words feedback from each of them) (At least 50 words feedback from each of them, Positive or negative feedback will not determine the marks but the quality of the feedback will)

## Milestone 2

Discuss your project with Two Persons outside the Bennett University (apart from your family members) and ask them how they rate your project and its progress from 1 to 10 scale. Write all three names, who they are, email and Mobile No of those. They should be ready to confirm if they are called on their mobile number (1+1 for each of two).

Nivedita Tyagi

Bank Manager

Email: [Nivtyagi@gmail.com](mailto:Nivtyagi@gmail.com)

Contact: 9868951826

It's a great idea because we as patients face so much difficulty in booking appointments, but through this app it will be easier and convenient. This application will not only help the single user but will also let the user to help others. I think accessing this app through google assistant is really nice and cool.

Arjun Bainsla

CA Student

Email: [Yyo3929@gmail.com](mailto:Yyo3929@gmail.com)

Contact: 7838360783

The idea is good and if some steps are taken for easier and early treatment of patients, then should come to the frame and applied as soon as possible. This feature makes it very easy for the people to access the hospital facilities without any trouble. This application is very time saving.

( At least 50 words feedback from each of them, Positive or negative feedback will not determine the marks but the quality of the feedback will)

## Milestone 2

Get a rating from your mentor (Only One Mentor) and ask him for a rating from 1 to 10 about your consistency, progress and potential to complete the project on time. ( 3 Marks)

( At least 50 words feedback from each of them, Positive or negative feedback will not determine the marks but the quality of the feedback will)

Rating for Deepak Sharma capstone project: 8 out of 10

" 'The appointment chatbot' of Deepak Sharma is showing promise to be completed as per specifications, in spite of so many disruptions of job interviews. I have seen the basic system which can perform basic dialog steps with a user and respond by asking for date and time. If any part is not clear, it asks the user to repeat the information. At the moment it can handle simple sentences and can pick up relevant key words from it. It can then interface with Doctor/Executive's google calendar to figure out if slots are already occupied or not. "

-Professor K. K. Biswas(Mentor)