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# VIRTUAL BANK ASSISTANCE: AN AI BASED VOICE BOT FOR BETTER BANKING

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**ABSTRACT:** A banking bot project is built using Artificial Intelligence algorithms that analyze the user's queries and understand the user's message. The system is designed for banks to use where users can ask any bank related questions like loan, account, policy, etc which are bank related queries. This application is developed for devices that have internet connectivity. The system recognizes the user's query and understands what he wants to convey and simultaneously answers them appropriately. At present, there are chat applications for banks. The questions asked by the users can be in any format. There is no specific format for users to ask questions. The built-in artificial intelligence system realizes users' requirements and provides suitable answers to the user. These voice bots can be built from scratch or they can be deployed on existing chatbots by enabling them with voice services. It also uses a graphical representation (if necessary) of a person speaking while giving answers as a real person would do as an employee. Bank bot solves the issues a user has and clarifies it with its knowledge.

## 1 Introduction

It is surprising how technology is so dynamically transforming one sector after another with revolutionary innovations. After the early rattle of IoT (Internet of Things), AR (Augmented Reality), VR (Virtual Reality) and Cloud computing, now we have the digital voice assistant technology to look forward to. The major growth of the I.T sector is Banking, financial services and insurance (BFSI).

Based on the combination of machine learning, Artificial Intelligence, Data analytics, and cloud computing, the digital voice-enabled assistant may not sound like a new phrase to you. You might have heard of a personal assistant helping you organize and manage your daily life routines. Here the concept of voice-based services extends far beyond just personalized assistance to touch the banking sector at large.

People have been using finance apps for personal banking for a long time since it allows them to perform banking tasks on their mobile devices without personal interactions. But many of us never knew that digital voice banking is getting prepared to

grow invisible and creep into the consumer's daily life.

## 2 What is a chatbot?

A chatbot is a computer program that uses AI majorly ML to have a conversation with humans. Users can ask questions, make requests and respond to chatbot questions and statements using natural language. A chatbot could support text input, audio input, or both. [4]

The terms chatbot, virtual assistant, and conversational agent are sometimes used interchangeably, but chatbots tend to support simpler conversations and more singular tasks. A chatbot could tell you whether it will rain tomorrow, but a conversational agent might determine that what you really need to know is what you should wear.

All these conversational technologies employ natural-language-processing for enabling natural-language-recognition capabilities to discern what the user is saying and other sophisticated intelligence tools to determine what he or she truly needs to know. These technologies are beginning to use machine learning to learn from

interactions and improve the resulting recommendations and responses.

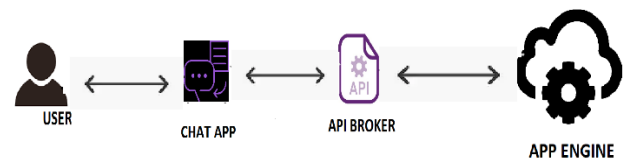
### Benefits

A chatbot can help you provide a strong user experience in a number of ways:

- **Respond immediately:** By using a chatbot, you can help many users avoid long wait times for phone-based customer support agents or even longer wait times for email- and form-based support. A chatbot can be available immediately.
- **Stay open all time:** Staffing a customer support center around the clock can be extremely expensive and it is useless because humans have feelings and may respond harshly. For some departments such as HR, it might not be possible. A chatbot, however, can answer questions 24x7, even on holidays.
- **Always conversational:** Chatbots make it easy for users to find the information that they need. Users can ask questions in a conversational way, and the chatbots can help them refine their searches through their responses and follow-up questions which make them strong. Having substantial experience with personal assistants on their smartphones and elsewhere, users today expect this level of informal interaction to make their life ease. When chatbot users are happy, the organizations employing the chatbots benefit and the banks get highly satisfies customers.
- **Cost reduction:** The potential to reduce costs is one of the clearest benefits of using a chatbot. A chatbot can provide a new first line of support, supplement support during peak periods or offer an additional support option. In all these cases, employing a chatbot can help reduce the number of users who need to speak with a human. You can avoid scaling up your staff or offering human support around the clock.
- **Improve loyalty:** By providing a responsive, efficient experience for

customers, employees, and partners, a chatbot will improve satisfaction and loyalty. Whether your chatbot answers questions about employees' corporate benefits or provides answers to technical support questions, users can come away with a strengthened connection to your organization.

- Building a chatbot might be less complicated than you think—and the payoff can be significant. Offering a responsive, conversational channel for communication can help you meet expectations for immediate, around-the-clock interactions while keeping personnel costs under control.



**Fig 1 Chat Bot Architecture**

### 3. What is a voice bot?

The moment we hear Voice-assistance or Voice chatbot the first thing that crosses our mind is either Google assistant or Cortana or Siri or Alexa. These brands have perfectly placed themselves in our day to day lives and certainly being the most useful tool. Now it has become one of the trends, we will be looking forward to in 2020. As per ComScore prediction, 50% of all searches will be accomplished by voice search in 2020.

A voice bot, as the name suggests is a virtual 'Bot' or computer program that conducts a conversation. Powered by artificial intelligence (AI) and natural language processing (NLP), these Bots are designed to simulate human conversational patterns. These bots are used in a variety of practical scenarios such as customer service.

As mentioned, some chat or voice bots use sophisticated underlying technology such as

AI and NLP. Some simpler ones scan for keywords from within a pre-defined database to extract a reply with the most matching keywords or wording pattern. Depending on how they are configured and designed, bots can be highly differentiated with respect to their functionality and conversational quality on their task basis.

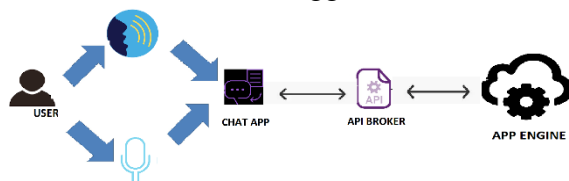
Voice Bot is a type of chatbot that works by the voice. They use the primary mode of communication that is a voice. They listen to the command given by the speaker and perform the required action with the underlying chat-bot design.

They are considered as an intelligent way to communicate. Voicebot is commonly integrated into voice assistants like Amazon Alexa, Cortana Google Assistant.

Like chatbots are evolving every day so are voice bot. They have become one of the preferred ways to communicate with this generation of smart buyer. These voice bots also help the illiterates also who cannot type or chat with the bots.

Statistics say that the new generation is looking for a voice assistant to a website or app because it is more convenient (52%); it allows them to multitask and do things without using their hands (48%); it helps them to make recurring purchases (41%). (Conversational Commerce by Capgemini Report – 2018)

Voicebot makes your product easy-to-use by providing information and the convenience to talk from anywhere. Voicebot is considered one of the biggest trends in 2019.



## Benefits

**1 Analysis of Users Intention:** The ability to understand the meaning. [9]

This is perhaps the most essential criteria. Meaning and comprehension is everything during a conversation. Sadly, as human beings, we aren't always literal or to the point when we speak. Bots should be enabled with the intention analysis services as it helps them in making relevant conversations and searching the user requests.

For example, the intent behind a "sure" or "why not" is most likely a "yes". Conversely, "I'm good", "later" and "not really", likely translates to a "NO". These simple examples show that a chat bot's job is rather nuanced.

**2 Pause and go:** The ability to pause and listen [9]

The first point around intent comprehension makes it clear that the bar set for machine programmed assistants like chatbots and voice bots is rather high. While you want the bot to be a 'good listener' so it can determine the next steps or pause when the person on the other end is talking, you also want the bot to be able to make the reason for its call very clear.

For example, voice bots are frequently used to apprise clients of some important information or remind them of say, a due date. A good bot design would be one where the bot is programmed to not pause during that time when it's providing critical information, even if it is interrupted. So as to make the intent of the call clear.

## 3 Streaming Recognition

As with all technology, speed is essential for a pleasant, efficient experience. A good voice bot should, therefore, be able to interpret and act at the same rate at which the customer speaks. Lags and slow responses cause frustration and create a poor impression of the business. [9]

## 4 Personalized Banking

Especially once a customer has gone through the trouble of calling a company, navigating pre-programmed IVRs to identify

themselves (like id number, account number, street address, etc.); has selected the relevant options to provide basic information about the reason for the call, it's very frustrating if customers must repeat similar information.[9]

Optimal integrations and programming should ensure that the bot greets the caller by name, knows caller history, picks up the likely reason for the call based on current and past calling patterns. Most importantly, a good bot should be able to personalize suggestions based on this type of customer knowledge.

### **5 live agents Access**

Voice bots are there to assist agents in meeting customers' needs. They are not there to replace agents. They are necessary for replacing the frequently asked questions to reduce the burden on agents. At any time during a call, the customer should have a seamless option to speak to a live agent. Not to say that this should happen at the drop of a hat, but should be based on pre-define user-oriented fallback rules. For instance, if the bot can't understand the customer's issue within a single question, the customer or caller should be redirected to a live agent on priority. [9]

- **Bots can push relevant content to end-users and test user engagement with it**

Currently, most banks offer a wide variety of products and services – credit cards, savings accounts, debit cards, financial planning, personal loans, mortgages, etc. Yet many customers are not always aware of all the products offered by the financial company they're doing business with. In addition, users often use many different financial options depending on how effective various banks were at providing incentives during the time a customer had a specific need. As such it is not uncommon for one customer to have 5 different credit cards, a student loan, mortgage, personal

loan, savings accounts, investment portfolios – all with different banks.

It is in this context where chatbots can become a competitive tool. They can not only push relevant information to a specific user to drive engagement with the brand, but also to test the interest level in specific products.

Bots can introduce users to the benefits of using new banking services and even gather competitive information from them. At the same time, because users know they are dealing with an automated system and not a real person, customers can ask the bot to stop asking questions like they do with any unsolicited text messages – by simply texting “stop” back.

In short, companies can solicit feedback and promote various products via automated bots. Provided that these attempts to engage with customers through automated systems are not so frequent as to annoy the end-user, they can serve as an excellent data-gathering tool while concisely reminding existing customers of their financial products' benefits and/ or presenting other products

- **Bots can lead a company's personalization strategy and generate incremental revenue**

Personalization refers to the overall digital strategy that leverages key data points about a customer to present **relevant** offers, products, and services to a target audience, when customers **need** or **want** to engage in a new purchase.

Sometimes, even if the customer does not specifically need to buy a new product or service, a perfectly executed personalization strategy could lead to “compulsive buying.”

Banks have traditionally done very little in the field of personalization despite the reality that they have the necessary rough data to do an excellent job at it.

Think about it: your primary bank knows how often you use your card, in what

product categories, how much income you're getting and when/ where/how you spend your money. It also knows how often you're paying credit card bills and in what amount. All this information is currently going to waste because most banks do not execute strategies that would offer users personalized tools, promotions and opportunities.

The use cases in which financial institutions could leverage existing customer data sets are endless.

Another use case for personalization is the ability of banks to encourage users to refer their friends. This is done every day in retail where customers can simply refer a friend to make a purchase and get some incentive in return. With satisfied customers being the best brand promoters, banks should use chatbots to encourage their customers to act as brand ambassadors and help with user acquisition.

#### 4. EXISTING SYSTEM

Remember the time when we used to rely on IVR customer services and support to resolve issues related to the computer problem or mobile services. It was surprising how we used to interact with our mobile devices and type on the glass screen to communicate our concerns. However, everything wasn't really that smooth and functional every time the approach to customer service is made.

The massive issue was that most IVR systems didn't offer quick problem learning or problem-solving abilities. They didn't have learning capabilities that today's virtual voice assistant develops over time. Moreover, typing was not practically the most effective way to interact with a device or a computer for the most common problems. It wasn't that long ago that we

had to invest a lot of effort into fulfilling the minor routines.

The world without the voice-driven AI services would seem slow, inefficient and strenuous now that we can think of adopting enlightened virtual assistants. They enable us to make informed decisions and solve an issue in a matter of seconds.

#### Disadvantages of existing system

Banking has become increasingly dependent on information systems and the use of most modern technology has also become increasingly significant. But, the lack of voice assistants is being seen in banks. All banks do have the same features as Net-Banking, Credit card services, etc. Apart from providing Business Intelligence and schemes, services in attracting people, banks should also provide voice assistant services to attract illiterates to use their banking services.

#### 5. PROPOSED SYSTEM

The Artificial Intelligence-based services include services like automatic checkbook re-order facility, etc, banks internally use them for employees' performance evaluation, credit evaluation of customers, etc and products like customized investment advice for customers after for their portfolio analysis and customized investment solutions after evaluation the credit history as well as income pattern.

#### Advantages

- They can give customers information on their accounts and help them make credit card payments from their smartphones.
- An automated chatbot program can communicate with the bank's customers via text and voice messages on users' interests.
- These bots are trained with existing issues that have occurred prior to it. So, If the customer has any doubts related to them then these bots will help the customers in solving them and the customer service



agents can work on the new issues and critical problems.

- Bots analyze the expenditures of the customers and help them in increasing their rewards and savings by giving suggestions.

## 6. MODULES

### Administrator

He is the admin for the application. He has access to changing the decisions for a query. He trains the bot to answer the queries for specified input keywords. If there is any error or risk in the application strategy, he needs to defend it.

### Customer

He is the user who has an account in the bank or a person who wants to try the service of the bank. Providing service for this person is important as we need them. He asks the bot for services or queries. Maintaining a good relationship with this person is necessary for the bank

### Employee

He checks his inbox for the tickets that are generated if the customer is not satisfied with the data or the answers provided by Bot. He is the person who directly contacts the customer for the ticket generated and provides sufficient information for that ticket.

## 7. IMPLEMENTATION DETAILS

This section contains the assumptions that we have made while developing this project. If these conditions are not satisfied our project may work improperly or may completely stop working. This section enlists all the assumptions that we have made during project development.

It also contains dependencies of our project i.e. on what things our project is depended upon. Due to the lack of these things again our project may work improperly or completely stop working. This section also enlists the dependencies of our project.

We have considered few assumptions during the development of our project. Nonsatisfaction of these assumptions may lead to improper working or failure of our project.

These assumptions are:

Member is a human: The person who is going to register on our website and develop a bot is himself not a bot but a human being.

### Dependencies

We have a few dependencies on the development of our project. Non-satisfaction of these conditions may again lead to improper working or failure of our project. These dependencies are listed below:

1. Internet Connection: Internet connection is one of the most important resources without which this website cannot be started. Also, we have used various APIs from the application that is necessary for banking services like balance fetching, details of customer details, etc. Hence the Internet is a must for our website to run even though it's on the localhost.

2. Web Server: We require a Web Server that can be used to host our website and the application. It can't be accessed by clients unless it's hosted and has a public IP. A web server by default has an HTTP request generator, Database, Integrator with the application, etc.

## 7. SCREENSHOTS

Please enter your customer ID

58104708

please enter the card family type which you have chosen

CO-branded

If your details exist in our database we will send information about the credit card details to the mobile number  
Your credit would be sent to the registered address with in 5 working business days  
customer id is 58104708

It's my pleasure. Is there any thing that I can help you out?

Type something...

Voice Bot

Hello. How can I help you?

## 8. CONCLUSION

A chatbot is a piece of software that can have a conversation with a person. They listen and respond with relevant information. There are digital assistants that are voice-activated, and there are chatbots, voice or text activated. Bots can vary according to the back-end integration of artificial intelligence. This allows brands to do more for the customer than respond with basic logic. Chatbots are supposedly better than chat software which often feels like one-dimensional conversation. Chatbots are more conversational whereas digital or intelligent assistants go beyond bots to

perform tasks that assist the user. Most customers have very low expectations when it comes to the self-service offered by banks because often it is terrible. Many self-service transactions result in a customer having to contact the call center anyway, not a great customer experience.

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