

RESEARCH ARTICLE

THE FUTURE OF DATA VISUALIZATION IN THE AGE OF ARTIFICIAL INTELLIGENCE (AI)

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ABSTRACT

Artificial intelligence (AI) is a branch of computer science that deals with the development of intelligent machines that can perform tasks that typically require human intelligence, such as understanding natural language, recognizing images, and making decisions. Chat bots are one of the most popular applications of AI technology, used for customer service, personal assistance, and even entertainment. An AI tool is a software application that uses artificial intelligence algorithms to perform specific tasks and solve problems. AI tools can be used in a variety of industries, from healthcare and finance to marketing and education, to automate tasks, analyze data, and improve decision-making. A chat bot is an AI-powered software application that simulates conversation with human users through text messages, voice commands, or both. Chat bots use natural language processing (NLP) algorithms to understand and interpret user input and provide relevant responses. Chat bots can be used for a variety of purposes, such as customer service, marketing, and personal assistance. AI is now ruling the world, there are many AI apps available in the market which makes the people work take less man power and time. Everything is computerized in present generation, it will not take much time to spread whole the world with AI applications and gadgets from children to senior citizens. What actually artificial Intelligence? AI? It's nothing but a person or programmer insists such a code (software) to actively interact with humans by answering all their questions/doubts. The perception of 100 people were collected to know the clear idea about AI. This study shows effective implementation of AI usage to reap tremendous potential to increase usage of AI tools.

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INTRODUCTION

A chat bot is a piece of software that helps in the natural development of a conversation with a user. AI has become increasingly complicated as data innovation and correspondence have progressed. Artificial intelligence frameworks mirror human way of behaving like going with choices at the time, executing routine jobs, responding to user's fast, and answering questions. E-business, entertainment, virtual aid, and other electronic groups abound. In this generation, everything is becoming more and more connected to internet. It's a very good way to manage and benefit from everything that's just outside your door. At runtime, they have a very limited knowledge base no way keeping track of all the talks. Chat bots employ machine learning to assist AI in understanding user queries/doubts and providing an appropriate response to the user. For conversing or engaging with the user, they are created utilizing the AI Markup Language. Answering engines are another name for chat bots. Because the knowledge has already been programmed in advance, this application works in a very straightforward manner. Design coordinating, normal language handling, and information mining are a portion of the methodologies utilized in the application.

The chat bot looks at the client's provided sentence to a current example in the information base. Each example is assessed to the chat bots information, and this data was accumulated from an assortment of sources. Consumer loyalty with an organization's administrations is as often as possible saw as the way in to an organization's drawn out progress and seriousness. Customer satisfaction in the protection business, for example, charge card protection, is getting a great deal of consideration. A competitive market like credit card insurance, a solid marketing approach is essential. Consumers are increasingly using credit cards, even though its elements are complicated and complex. Most credit cards include a complementary insurance product as part of their package.

Key Features of Modern Artificial Intelligence(AI): There are 3 Key Features of Modern AI chat bots. Modern AI chat bots come with a range of features that make them highly effective for business applications.

Natural Language Processing: AI chat bots use NLP to identify and understand the intent of a user's questions or commands. AI bots can also easily recognize typos, slang words, and acronyms.

Machine Learning Algorithms: AI chat bots leverage machine learning algorithms to learn and improve their natural language understanding continuously. AI chat bots can recognize user sentiment and personalize responses accordingly.

AI-powered Conversational AI: AI chat bot applications use AI-driven technology to interpret and respond to spoken or written inquiries from customers and employees. AI chat hot platforms create AI chat bots that are intuitive.

OBJECTIVES OF THE STUDY

- To study the Artificial Intelligence (AI) functionalities and its implementation.
- To know the awareness about the Artificial Intelligence (AI) among the people.
- To study the data visualization with the help of Artificial Intelligence (AI).

How do AI chat bots work?: Trained AI bots can operate independently using NLP and machine learning. NLP combines language rules with context to interpret what is being communicated and enhance natural language understanding. With practice, the best AI chat bots learn to recognize verbal cues that help them better understand the user's sentiment.

At a basic level, an AI chat bot using NLP works as follows:

Step 1: A human asks a question using slang and acronyms

Step 2: AI algorithms are applied to the text of the customer question, picking up in types abbreviations used

Step 3: The AI program delivers a human-like response to the consumer via text or SMS.

It is during Step 2 that AI tech and NLP apply. This is where technology identifies the user's intent and determines specifics about the request (known as entities). Algorithms based on previous data can infer feelings like frustration or anger so that the AI bot can deliver a more targeted response via a realistic conversational experience. Chat bot platforms create AI chat bots to be intuitive. So, with practice, they learn more effective ways to respond. They develop more sensitivity resulting in more accurate answers and better customer interactions. Chat bots can be trained to triage questions at the start of a session to immediately route the query to the appropriate endpoint, sometimes to a live agent. When the AI chat bot doesn't have the answer, automated helpdesk technology steps in. Chat bots developed with API also support integration's with other applications.

Where the AI chat bot will be implemented?: According to Juniper Research, 43% of the chat bots are located on the business website and this trend will grow the upcoming years. The website of the business shall be the center of its digital universe to which all digital paths lead. It is crucial to ensure that all customers' questions are answered at any time. Inquiries are accommodated, and first-party and zero-party data are collected. The AI chat bot helps with all of that. Implementing a chat bot on the website directly and not using some messenger widget means having full control of it and not depending on third-party requirements and restrictions. The business can have access to all functionalities and can create, maintain and

train the chat bot at any time without the need of knowing the specifics of the messenger-based platforms, having instant access to collected data about customer behavior and customer feedback to understand customers better. Also, the business will have a 24/7 digital brand representative to talk to customers and engage them, which will help with customer retention and increase website traffic. A chat bot is implemented on a website very easily. A short code must be placed in the website's code and it will appear in the right corner, ready for chatting. The code can be placed by the business itself if it maintains its own website or gives it to the outsourced company which supports it to implement the chat bot's code. The process usually takes just a few minutes.

The rest of the chat bots globally are in messengers (48%) and mobile applications. They have their pros, such as covering the Omni-channel approach to customer service and making sure the customers' needs are met in these channels, also keeping the customer chat history accessible. Here are the cons. Messengers have restrictions related to content and communication price is based on the number of messages or number of customers who chatted with the chat bot (harder to plan the monthly expense) and some even have a package of minimum conversations required that make them expensive for small businesses. Adding conversational AI may require integration with open-source AI platforms (learning to use one more platform or hiring someone to do it for you), there are GDPR policies that need to be taken in consideration to ensure no rule is broken, what happens in the messenger days in the messengers (no traffic to the website, unless you redirect the user to the website but is there a chat bot to continue the conversation?), less data for customer behavior and needs and other. Facebook Messenger introduced an incognito mode to users with automated deletion of the chat after 24 hours, so benefits are gone.

What will be the AI chat bot functionalities?: The functionalities of the chat bot depend on the business specifics and needs and what the main purpose of the chat bot will be. The chat bot can have inquiry forms, redirects to different sections of the bot, direct links from online and offline (with a QR code) to a precise place in the chat bot to redirect customers from anywhere to it. It gathers live statistics about customer behavior, it can be with or without conversational AI with voice recognition and commands, on many languages. All these and many more can be chosen by the business based on what it assigns the chat bot to do. For example, a small business, an online car parts store Danexo in Bulgaria, has a chat bot, made on the Omni platform, that helps potential business partners request an account, and individual customers to place an order for a part. Mainly forms are used, without AI. A large 5-stars hotel with many customers, and different services and departments like Casa di Fiore SPA & Medical has also a chat bot on the Omni platform that offers many functionalities and conversational AI to fulfill all customers' needs. Some key functionalities of the Omni platform integration with Chat GPT for faster and easier AI chat bot creation still with business-controlled content, voice recognition for more convenient online communication, clickable texts, buttons with CTA and images on the website that open a concrete element (a form or carousel with cards with more information) in the AI chat bot and many other to help the business improve its online customer service, marketing and sales and overall business processes.

METHODOLOGY

The research is based on primary and secondary data.

Primary Source: The present study was largely based on primary source which was collected through the structured questionnaire method.

Secondary Source: The data from the secondary source is used in the present study. The sources are internet, books, journals, Newspapers etc.

Sample Size: Data was collected from 100 respondents to know about the people are aware about the AI.

Table 1. Respondents Personal Information

Particulars	Category	No. Of respondents	Percentage (%)
Age	18-25	67	67
	25-35	23	23
	Above 35	10	10
	Total	100	100
Occupation	Student	80	80
	Business man	12	12
	Professional	04	04
	Others	04	04
	Total	100	100
Respondents knowledge on AI chat bot			
Are you aware of Artificial Intelligence (AI)?			
	Yes	89	89
	No	11	11
	Total	100	100
Are you aware of chat bot?			
	Yes	84	84
	No	16	16
	Total	100	100
Do you get instant replies from chat bots?			
	Yes	66	66
	No	03	03
	Sometimes	31	31
	Total	100	100
Will chat bot answer to all type of queries?			
	Yes	84	84
	No	16	16
	Total	100	100
“Chat bot offers a wide range of services “			
	Agree	75	75
	Disagree	06	06
	Neutral	19	19
	Total	100	100
Have you experienced chatting with AI chat bot?			
	Yes	59	59
	No	41	41
	Total	100	100
Are you aware of AI restaurants (robots serving food)			
	Yes	85	85
	No	15	15
	Total	100	100
Did you face any problems while using chat bots?			
	Yes	18	18
	Not really	58	58
	Sometimes	24	24
	Total	100	100
Do you need any changes in chat bots?			
	Yes	71	71
	No	08	08
	Maybe	21	21
	Total	100	100
Is AI chat bot helping you in your day-to-day activities?			
	Yes	94	94
	No	06	06
	Total	100	100

Source: Primary

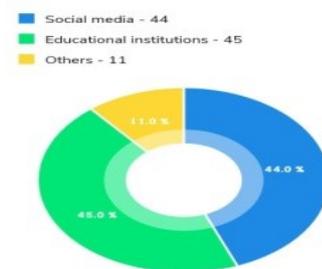
From the above table 1 we can understand that people aged between the age group from 18-25 are mostly playing an important role in the usage of AI Chat bot, almost upto 67%. And also the people are most of the students. The 89% of people are well aware about AI, and 84% of people known about Chat bots. Most of the people opinion is that 66% of the people are saying that they will get instant replies, and 31% of people are saying that they will get instant replies only sometimes. Consumers agreed that AI Chat bot is very helpful to them by 84% and 75% of respondents are saying that AI Chat bot offers a wide range of services which will be very much useful and appropriate for their day to day activities also by 94%. 59% of respondents are familiar in chatting with AI chat bot and also most of the consumers are aware of AI restaurants by 85%. The most of the people are facing the problem with AI Chat bot by giving some wrong information as per user requirement by 18% and 24%, but 54% of respondents are satisfied with the AI chat bot. 71% of people need some more changes to be happen in chat bots with more advanced features.

DATA VISUALIZATION

Analysis based on how respondents know about chat bot

Particulars	Responses	Percentage
Social media	44	44
Educational institutions	45	45
Others	11	11
Total	100	100

Source: Primary

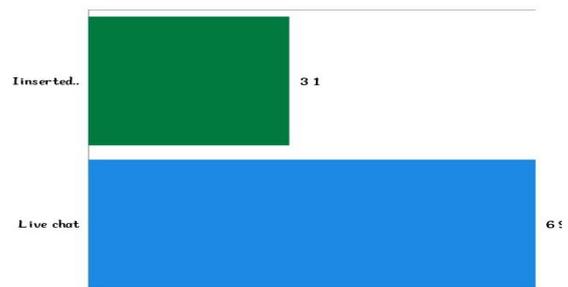


The above pie chart represents that 44% of people known the chat bot through socialmedia, 45% of people are known by Educational Institutions and 11% by others.

Analysis on what respondent’s preference:

Particulars	Responses	Percentage
Live chat	69	69
Inserted software	31	31
Total	100	100

Source: Primary

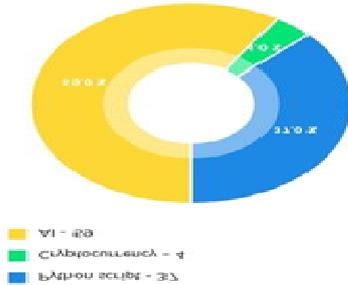


The above bar graph represents that 69% of respondent's preference is to have live chat and 31% preference is to have inserted software.

Analysis based on Deep learning and machine learning comes under

Particulars	Responses	Percentage
Python script	37	37
Cryptocurrency	04	04
AI	59	59
Total	100	100

Source: Primary

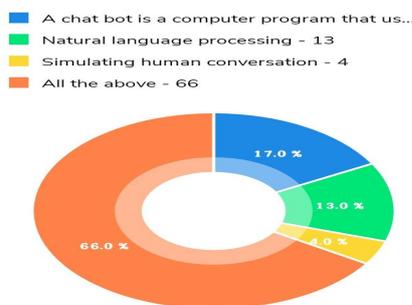


The above pie chart shows that out of 100 respondents, 59% are saying that deep learning and machine learning comes under AI, 37% of people are saying that deep learning and machine learning comes under python script and 04% people saying that it comes under Crypto currency.

Analysis based on "what is chat bot" according to respondents:

Particulars	Responses	Percentage
A chat bot is a computer program that uses AI	17	17
Natural language processing (NLP)	13	13
Simulating human conversation	04	04
All the above	66	66
Total	100	100

Source: Primary



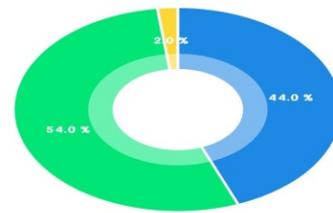
The above pie chart shows that what chat bot according to respondent's vision is. 17% of respondents are saying that chat bot is a computer program that uses AI, 13% of respondents are saying that chat bot is a Natural language processing (NLP), 04% of respondents are saying that chat bot is a simulating human conversation, and 66% of respondents are satisfied to all the above 3 options which will actually deals with AI in multiple ways.

Analysis based on which website do respondents find chat bots more:

Particulars	Responses	Percentage
Educational institutions	44	44
Private Business	54	54
Government websites	02	02
Total	100	100

Source: Primary

■ Educational institutions - 44
■ Private business - 54
■ Government websites - 2



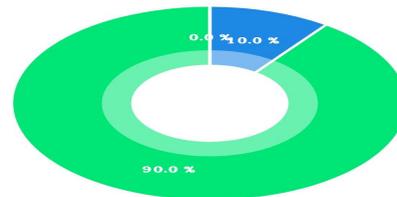
The above pie chart shows that out of 100 respondents, 54% of people are says that private businesses are highly using the chat bots compared to another categories. 44% of people stated that 44% Educational Institutions are using chat bots and government websites are using chat bots only 02%.

Analysis based on primary purpose of chat bot:

Particulars	Responses	Percentage
To provide entertainment	10	10
To facilitate efficient communication	90	90
To play games with users	0	0
Total	100	100

Source: Primary

■ To provide entertainment - 10
■ To facilitate efficient communication...
■ To play games with users - 0



The above pie chart reveals that out of 100 respondents, 90% people says that the primary purpose of chat bot is facilitate efficient communication, and 10% of people are stated that purpose of chat bot is to provide entertainment and people's opinion is that the primary purpose of chat bot to play games with users is 0%.

RESULTS

- Respondents Age between 18-25 are aware of chat bot AI and they have experience in chatting with AI chat bot and most of them are students.
- From the 100 responses 59% people are experienced with chatting in AI chat bot and only 41% people are not having experience chatting with AI chat bot.
- Around 85% people are aware of AI chat bot restaurants and 15% people are not aware of them.
- According to the information gathered 66% of people are believing that chat bot gives instant replies and 03% people are not agreeing with that statement and 31% of people said that chat bot gives replies for only sometimes.
- Most of the people know about chat bot through the Educational Institutions (45%) and some of the respondents know from the social media (44%) and others (11%).
- Around the 69% respondents are prefer for live chat the only 31% people are preferred inserted software.

- From the respondents we found 3 phases of people facing problems while using AI chat bots 18% of people had faced problems while using AI chat bot and 58% people had problems very rarely 24% people had no issues.
- From the 100 responses 71% of people felt that updating is must and 08% of people felt that it is perfect and no need to change but 21% of people were not known.
- Around 59 percent of the respondents are saying that deep learning and machine learning comes under AI and 37 percent people are saying that deep learning and machine learning comes under python script.
- Around 75 percent people are agreed with the statement that chat bot offers wide range of services and remaining 19 percent people are neutral with the statement and 06 percent people are disagree with the statement.
- Most of the respondents are responded that private businesses and educational institutions are highly using chat bots compare to other categories.

CONCLUSION

Chat bots can save time and money for the companies but human involvement in customer service is very much required in order to understand advantages of chat bot and disadvantages of chat bot one has to understand technologies behind the success such as AI machine learning. Augmented Reality and so on. The literature review demonstrates that AI Chat bots have the potential to improve various industries such as e-commerce, customer service healthcare and education, chat bot can provide personalized and prompt responses to customers improving customer experience and reducing costs for businesses. However, the implementation of AI chat bots raises ethical considerations related to privacy, bias, and accountability, which need to be addressed. As AI and machine learning technologies continue to evolve, we can expect chat bots to become even more sophisticated and capable of handling more complex tasks. Minimal human interference in the use of devices is the goal of our world of technology chat bots can reach out to a broad audience on messaging apps and be more effective than humans are. At the same time, they may develop into a capable information gathering the usage of chat bot AI has become increasingly prevalent in various industries and is proving to be a valuable tool for businesses to optimize customer service, marketing, and sales chat bots can provide immediate assistance and engage with customers in a more efficient and personalized manner than traditional methods. However, implementing chat bots requires careful consideration of the technology's capabilities and limitations, as well as the target audience's preferences and behavior. Companies should also regularly evaluate the performance and effectiveness of the chatbots to ensure continuous improvement and enhance the overall customer experience.

In addition to the benefits of chat bot AI, there are still areas that require improvement. Natural language processing (NLP) technology which enables chat bots to understand and respond to user inputs still has limitations, and struggles with complex language and tones. Therefore, chat bots need to improve their ability to understand the nuances of human communication and respond appropriately. Furthermore, chat bots can benefit from more advanced machine learning algorithms to enable more personalized responses and better anticipate users' needs. Additionally, chat bots need to integrate better with other

communication channels, providing seamless interactions across multiple platforms including websites, social media, and mobile apps. Overall, as technology advances and improves, chat bots will continue to evolve becoming more intelligent and capable of more sophisticated interactions with users.

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