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Introductory Chapter: Journey to AI Driven Chatbots

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1. Introduction

Business communication today is driven by the organizational financial performance and customer best quality service provision. The rise of 24/7 ubiquitous access to Internet and Applied Artificial Intelligence (AAI) creates a platform for future fully-automated cyberspace. Role of Computing has become an essential part of research, innovation and development of future cutting-edge technologies that will transform the way we live to a next level, where Machine-to-Machine Communication will drive Human-to-Human Communication.

Today we see the technology that has brought the Computational Machines much closer to us people, and LEXA is becoming an integrated part home companionship and the entertainment for many young families who are tech-savvy and love to play with the high-tech. Naturally, there are many dimensions to technological innovation and application of AI that are fascinating and inspire scholars and industry developers to push the edge of advancement of next generation technologies that will promote a Cyber Automation and Ultra Smart Living for everyone.

The Machine learning (ML) as a subdomain of artificial intelligence enables smart computational device to abstract patterns from data without explicit programming. In addition to AI and ML, we see the rise of Humanoid Robotics that has potential to act like, look like, talk like and reason like human, and eventually becoming an essential part of an organizational business infrastructure worldwide [1].

Some experts compare level of intelligence of new Humanoid Robot called Sophia to that of a one month old new born baby that is at the very beginning of discovering the world around and is beginning to observe and to learn to communicate with his or her parents. Yet, very young and tiny, babies have a Natural Intelligence and Human Reasoning that may be compared to a computational capacity of most performant Supercomputer in the world today.

Many experts suggest that there are fundamental differences between the AI and Natural Intelligence (NI) and that future evolution of AI driven Software Agents and Humanoid Robotics may have strong impact on the future Industry 5.0 and 6.0, Business to Business (B2B) and Mobile Commerce (mC). Given recent COVID relates crisis, applications of AI in business, industry, government, academia and other sectors have become ubiquitous showing more and more examples of Smart Software Agents application.

The next section, presents examples of the AI driven applications including chatbots and ChatGPT, and discuss what, how and where they are.

2. What are the Chatbots?

Chatbots are one of the practical examples of AAI driven cyber automation. The software capable to facilitate human-machine conversation is known today as a chatbot. A chatbot software simulates and drives a real-time interaction between a customer a human partner, while bridging a client system and information acquisition domains.

Chatbot is a conversational agent that utilizes AI to interpret the text of the chat using Natural Language Processing (NLP). Instead of direct communication with human service personnel, the customer/client can make conversation via text or voice with the chatbot software [2].

The chatbots utilize the AI embedded conversational systems capable to recognize customers and information systems database driven keywords or word patterns to provide the human-like answer in real-time. Chatbots have become an essential part of organizational business infrastructures while improving a customer service with faster and cost effective best quality support.

2.1 Chatbots are not perfect yet

The rise of AAI and chatbots have created collection of new tools that are often applied by students, faculty and others to write scholastic essays, articles, reports and books. Given the AI vs NI capabilities, there are many remaining technological challenges, including:

- **Human to Human Perceptions:** Due to lack of human like NI, the AI and chatbots are capable of generating the text based response on client's data with certain limitations and to compose and write machine generated response only. Human to human like perceptions are important part of effective communication and it remain to be challenge for the AI and chatbots developers.
- **Emotional intelligence (EI):** Having clarity on what and how human emotions impact the composition and effective writing is essential part to communicate and convey the ideas effectively. Today, the AI and chatbots can generate text that is grammatically correct and factually accurate, but are unable to compute a human EI, which is natural for humans.
- **Contextual understanding:** The current AI and chatbots are processing information system database data without capabilities to understand a broader context in which ideas are communicated in writing, which ultimately generates errors and inaccuracies in the machine generated text.
- **Intuition and Creativity:** AI and chatbots today are capable to assist clients with the text generated by organization information system database data only, which does not reflect the level of human intuition and creativity. There are many technological challenges for AI & chatbots to generate original human like ideas and to communicate seamlessly the way humans do.
- **In light of current advances in the field of AAI and chatbots,** there are great improvements in machine assisted composition, rising to level close to Human like capabilities to write and to communicate the ideas effectively. The role of humans will continue to be essential in the process of innovation and development of future more sophisticated AI driven chatbots.

2.2 New generation of Chatbots

Evolution of AI driven chatbots brought a new Chat Generative Pre-Trained Transformer (ChatGPT) technology utilizing a dialogue-based AI chatbot capable of understanding natural human language and generating quite detailed human-like written text. These ChatGPTs are part of text-generating AI technologies and are becoming integrated in business, industry, government and other sectors worldwide.

The Chat GTP systems are trained by AI & ML, and are capable to answer questions via a conversational interface. These new OpenAI systems are trained on a very large sample of text adopted directly from the Internet information System, enabling a dialogue format for ChatGPT to answer or follow-up questions, to admit its mistakes, to challenge incorrect premises, as well as to reject inappropriate requests [3]. The results produced by ChatGPT are based on the data available in the organizational information systems database only. The ChatGPT today, are not able to collect data from primary sources independently and to advance the AI driven technological evolution in social sciences.

There are important challenges to make ensure data integrity and data accuracy in conjunction with the structural and legal frameworks regarding the copyright and the author's rights. There are critical challenges to make sure that the future impact of AI driven chatbots on mental health is minimum.

Current studies show, that the anxiety and paranoia levels have increased when interacting with chatbots acting like humans instead of humans communications with humans. Some social applications may mislead people with chatbots acting like humans to help people to socialize utilizing chatbots acting like humans. This may contribute to paranoia, and some users may not be able to distinguish whether they are talking to humans or chatbots. The studies show that extensive use of ChatGPT may contribute to paranoia caused by frequent interactions with chatbots instead of interaction with humans [4].

3. The Chatbots applications in B2B

Today, the chatbots are well accepted in the B2B providing a business value and promote framework for training chatbots in order to better serve B2B customers.

Chatbots have potential to provide support for fast and effective B2B shopping experience by providing personalized support and guidance, helping customers to find the right products or services quickly and efficiently. The B2B chatbots are trained to understand the unique client's needs and preferences, by utilizing a data analytics tools to seek insights into customer experience and preferences. By leveraging this data, chatbots can be trained to provide personalized recommendations, answer specific questions, and guide customers through the purchasing process [5].

One of the most essential criteria for a successful business is a customer satisfaction and perception of having the best quality of service with the best quality and guarantees of company services or products. The business to client and client to business communication is fundamental part of the company's success and future sustainable and successful growth. The next section, bring to light future challenges that chatbots will be facing in the years to come.

4. Chatbots future challenges

With continuing increase number of Chatbots in the government, business, academia, industry, and other domains, there is a new trend to market their services and products via chats and bots 24/7 worldwide. Given the large popularity of utilizing the chatbots applications, there are technological challenges concerning the impact that different usage contexts have on the chatbots' application in mobile commerce (mCommerce). Given number of differences in the nature of mobile business not all shopping contexts may be best fit for chatbots.

To address these challenges the following chapters present various examples of the client's perceptions and level of adoption of chatbots in mobile commerce. The current studies show that Chatbots are more suitable in the context of one-attribute, information-light, and group-buying tasks, whereas traditional Apps are suitable for multi-attribute, information-intensive, and single-buying scenarios [6]. There are yet new opportunities to design novel chatbots that will provide best user experiences and ultimately enhance the user perceptions and adoption intentions in all commercial sectors. The path to future is often found while looking in the past and asking a simple question, how did we get here [7–9].


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