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Intelligent Virtual Agent

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Abstract – Virtual training systems provide an optional way to train people in complex and dynamic tasks, such as crisis management or rotation. Clever agents are often used to play the characters that a practitioner interacts with. To enhance students' understanding of the situations played, several testimonials from agents that could explain the reasons for their actions were suggested. This article describes an empirical study of what instructors consider to be helpful agent explanations for learners. Different types of explanations are preferred for different actions, e.g. conditions that enable an action to be performed, fundamental goals for an action, or goals that can be achieved after implementation. act. When an action has significant consequences for other actors, the facilitator suggests that the views of others should be part of the explanation.

***Key Words*:** Artificial intelligence, chatbots, Virtual Agent,IT,RPA.

1. INTRODUCTION

An Intelligent Virtual Assistant (IVA) is an AI-powered chat assistant that uses analytics and cognitive computing to provide tailored replies based on specific customer information, previous discussions, and position, as well as the company's knowledge base and deep human understanding. It's more sophisticated than a typical chatbot, as its automated but not AI-powered.

Many research and white papers on bots, chatbots, and intelligent virtual agents have been published. Because the distinction between these technologies may not be clear until you have been actively involved in a conversational AI project. So, here are the four key characteristics of Smart Virtual Agents to get you started (or IVAs).

Intelligent virtual agents (IVAs) are sometimes mistaken with chatbots, however IVAs are far more complex than standard chatbots and can engage with a customer in a manner that mimics a human.

Natural Language Processing allows IVAs to grasp replies for which they have not been specifically designed (NLP). They also build up a broader vocabulary, grasp colloquial formulations, and provide exact and correct responses to enquiries using machine learning and deep learning. When opposed to typical chatbots, this is a definite benefit, since engaging clients in real dialogues helps to generate a favorable experience that lingers in their minds.

2. Features of IVA

The usage of intelligent agents in the home and at work has risen considerably in recent years. Intelligent agents are components of a programmed that performs a task unsupervised and with some level of intelligence.

Intelligent agents are continually being built and developed to perform a variety of repetitive and predictable jobs.

"An intelligent agent sees its surroundings via sensors and acts intelligently on that environment with its effectors," according to one definition of an intelligent agent. As a result, an intelligent agent acquires percepts one at a time and maps them to actions."

Figure 1: IVA basic information

Kenneth Laudon defines an intelligent agent as "software programmers that work in the background to carry out particular, repeatable, and predictable duties for an individual user company or software application.

A number of things must be considered while designing and producing an intelligent agent. This research examines these variables and issues, offering insight into how intelligent agents are impacting enterprises and society.

2.1. Powered by Artificial intelligence

Intelligent Virtual Agents (IVAs) are conversational bots that can aid people with a range of activities ranging from IT support to HR and Finance. Cognitive process automation and natural language understanding, a subset of artificial

intelligence that mimics the way the human brain functions to aid humans in making decisions, performing tasks, or meeting goals, are powering such conversational skills.

Natural language processing (NLU/NLG), image processing, pattern recognition, and - most significantly - contextual analysis are all used by Cognitive Process Automation to make more intuitive leaps, perceptions, and judgements for improved voice recognition.

In a nutshell, an Intelligent Virtual Agent is not a simple bot that responds to the user with a restricted range of pre-programmed responses.

Conversational abilities enable a Virtual Agent to better grasp the user's language, ask more questions to have a better knowledge of the context (who the user is, his function in the business), and coordinate numerous activities.

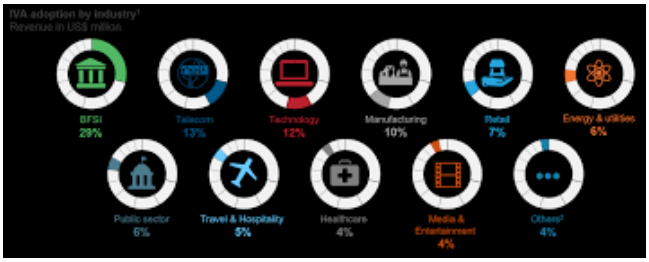

Figure 2: Impact of IVA

2.2. FOCUSED ON END-USER EXPERIENCE

A conventional chatbot can usually handle human-to-human chat or email conversations. A Virtual Agent, on the other hand, may provide multichannel integration, allowing people to contact you through the channels they want (live chat, voice or call bot, etc.). This covers business digital workplace technologies like Microsoft TEAMS and phone systems.

It may surprise you to learn that the telephone is still the favored route for users in many IT helpdesk settings. As a result, AI-powered speech technologies (voice Bot/callbot) in many languages are also necessary to guarantee that people feel at ease when contacting a call bot.

A Virtual Agent can also operate as an additional digital workforce to support human professionals, because human expertise is always appreciated. ITSM professionals, for example, for IT support triage or sophisticated inquiries.

2.3. SYNERGIES WITH OTHER TECHNOLOGIES

Other digital and automation technologies, like as RPA (Robotic Process Automation), IoT (Internet of Things), and analytics, can function in tandem with Virtual Agents.

Let's concentrate on RPA. Because combining Virtual Agents with RPA in a single end-to-end automation solution may boost operational efficiency and business agility. The development of a self-service password reset is an excellent illustration of this IVA + RPA technique.

According to Gartner, 40 percent of helpdesk calls are related to password reset or account lockout. By allowing customers to change their passwords by simply phoning an Intelligent Virtual Agent, help desk costs connected with passwords may be reduced by 70% to 90%.
In this case, the IVA can qualify the event, aid the user in resolving his issue, unlock the account, or set a new password, all while working in tandem with an RPA solution to generate the validation emails. For more information on Cognitive Process Automation and how it may be used in conjunction with RPA, see our website.

2.4. CAPABLE OF AUTOMATED LEARNING

Through the integration of knowledge bases (for example, from Upland RightAnswers, ServiceNow, Confluence, and others), current Q&A / FAQ, and connections to Digital Workplace tools like Microsoft SharePoint, a Virtual Agent may be extremely intelligent from the start.

But it is the machine learning potential of an IVA method to improve over time by studying automatically from human talks that makes it so attractive in a corporate context.

This automatic learning power might be the most crucial aspect in truly comprehending what an IVA is or should be. Because, at the end of the day, it's all about the end-user experience and happiness, which may make or destroy any technology initiative.

This end-user experience is always changing, with new tools and methods that staff must quickly understand in order to enhance productivity. As it gathers and analyses more data from its contacts with employees, a Virtual Agent must be nimble, evolutive, and produce greater value over time.

3. EXAMPLE OF USE CASES FOR AN INTELLIGENT VIRTUAL AGENT

We can start thinking about prospective corporate use cases now that we've established what an Intelligent Virtual Agent is.

We may identify five primary Intelligent Virtual Agent situations in the field of IT Service Desk, some triggered by the end-user and others by the Virtual Agent.

Those situations always involve a two-way discussion in which the Virtual Agent can comprehend and respond to queries, but also to deal with the natural context-switching and digressions that occur in real talks. This implies that even if a user skips a few questions, the Virtual Agent will not become trapped in a situation and will adjust to the dialogue and answer questions in real time.

End-user-initiated situations include self-service password reset, IT requests, and troubleshooting, as well as assistance with setup chores, sometimes known as "How to" queries.

The Virtual Agent can also start the conversation flow to communicate an essential message to the users.

The Virtual Agent can launch two sorts of scenarios: interacting inside the Virtual Agent's sphere of activity and communicating during scheduled maintenance and downtime.

Another post has been dedicated to describing the various use cases, with actual talks between the Virtual Agent and end users as examples.

All of these Intelligent Virtual Agent use cases may assist increase employee productivity, increase the adoption of digital Workplace products, and lower IT Service Desk expenses. However, the finest use cases and fast wins will be determined by the demands and pain areas of your individual users.

3.1. intelligent virtual assistants use.

E-commerce, finance, travel, healthcare, gambling, customer communications management, and other businesses all employ IVAs. They're useful for customer support teams that deal with a lot of the same inquiries.

Companies that are subject to fast or unforeseen surges in support volume may benefit from using an IVA. An e-commerce business, for example, that sees a spike in support requests around Black Friday might utilize an IVA to answer routine questions, freeing up human agents to work on other tasks.

When hiring is time-consuming or human agents do not provide a decent return on investment, fast-growing organizations might employ IVAs to hire workers (ROI). IVA is frequently used by B2C firms with established contact centers. Personalized Customer Experience.

Customers who want assistance want it as quickly as possible. They don't want to deal with a seemingly never-ending phone tree or a chatbot with limited capabilities. Intelligent virtual agents offer a human-like experience that can assist clients in efficiently resolving issues. When they have to wait for help or can't get the support they need, they feel upset. In many circumstances, these technologies can help a client solve their problem or route their call to someone who can assist them quickly.

3.2. Reduced Wait Times

Every second a corporation can save on an average customer care contact saves money and delights customers. Without the need for a human person, an intelligent virtual agent can handle basic and monotonous tasks. It can also gather important client data – an account number, a personal identification number, or a brief description of their problem – and have everything ready for the agent to help them get the most out of their engagement. This saves the agent time by allowing them to focus on the consumer instead of asking for information.

3.3. Around the Clock Service

Virtual assistants that are intelligent do not require sleep or vacation time. They may give service to consumers at any time of day. This is especially essential for US-based enterprises who don't want their call center operations to migrate overseas but yet want to preserve longer hours or use larger e-commerce platforms like Amazon. During more regular business hours, IVAs can fix common problems or collect client information for a follow-up contact from a live agent hour.

3.4. Improved Efficiency

Businesses have long sought call center solutions that reduce the strain on live operators while maintaining strong customer service standards. Customers are less likely to use phone, email, or live chat channels instead of artificial assistants when utilizing intelligent virtual agents. They have the ability to take over and divert client demands until a human operator is needed. This guarantees that agents' phone time is spent immediately assisting consumers with unusual or delicate circumstances that demand a human touch.

4. Benefits of intelligent virtual assistants

IVAs have a significant impact on customer service procedures. IVAs help both the client and the firm in the following ways.

4.1. Deliver exceptional customer experiences

Customers have come to expect and deserve quick, customized service. 71% of purchasers expect a customized experience based on their wants and preferences, and 74%

want a quick response. Using an IVA with back-end connectors allows you to respond quickly while also ensuring that your replies are targeted to your customer's data and preferences.

4.2. Increase efficiency

IVAs handle repeated inquiries and save time and effort for customer support teams. Customer inquiries are diverted via phone, email, and live chat channels when an IVA is used as the first line of defense. Agent time is employed where human interaction is necessary, and support tickets are automatically labelled, minimizing the backlog. This decreases everyone's wait time and saves money on recruiting and training live representatives.

4.3. Improve your agents' KPIs

Average handling time (AHT), first response time (FRT), customer satisfaction score (CSAT), and net promoter score (NPS) are all metrics used to measure customer satisfaction (NPS). What do these abbreviations have in common? The success and performance of customers are measured using these key performance indicators (KPIs).

All of the following indicators are frequently improved in companies that use IVAs. Virtual agents answer questions or escalate problems to an agent with the right tags and context to handle the problem quickly, resulting in a low AHT. Customers are greeted promptly by bots, resulting in a very short FRT. In addition, when IVAs improve overall efficiency, CSAT and NPS rise with time.

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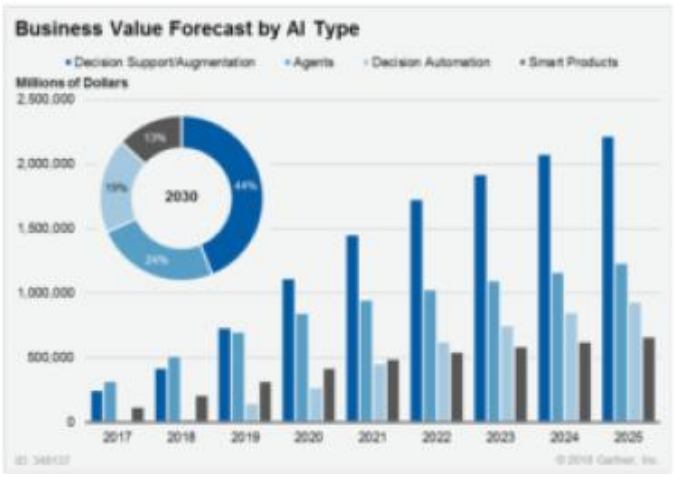

Figure 3: Business Value forecast by AI

4.4. Reduce agent frustration and churn

Traditional contact centre agents spend a lot of time dealing with repeated requests like purchase monitoring, refunds, and cancellations. This is infuriating for those who want to deal with more difficult issues, and it reinforces the long-held misconception that call centres and customer service professions are transient.

Your live agents can focus more on addressing more complicated issues if an IVA does these mundane activities, such as validating dates, names, and order numbers. Customer service may become a fulfilling and sought-after employment path as a result, lowering staff turnover.

4.5. Provide global, 24/7 customer support

IVAs have the advantage of being able to work at any time. For businesses that operate across time zones, this is a priceless tool. IVA can provide 24/7 assistance and escalations during regular business hours instead of recruiting extra people in other time zones hours. This helps reduce the backlog and workload and it keeps customers engaged round the clock as required.

Some IVAs provide multilingual assistance. Businesses may now operate in many markets without having to hire as many bilingual or multilingual agents as they would if they didn't have IVA's help.

Figure 4: IVA synergize disparate system

5. Learning of AIV and Chatbots.

Because chatbots are rule-based systems, the only way they can "learn" is if more human rules are added. They don't remember material or improve their ability to answer context-based questions.

Deep learning models allow IVAs to learn from examples. This implies that the more data you provide your AI model, the better it will get at identifying what customers want and effectively responding to them. Deep learning can be used to train even the most complex IVAs.

Human agents dive into discussions that the virtual assistant doesn't fully comprehend and educate it to detect the intent the next time it hears something similar. This increases the IVA's efficiency and allows it to process more enquiries in a shorter period of time.

Deep learning, natural language processing, and natural language understanding are among the AI technologies on which IVAs work.

Deep learning is a sort of machine learning that improves the IVA with each encounter while also retaining contextual data. IVA can interpret the text using natural language processing (NLP), which includes grammar, structure, and keywords. This is in contrast to NLU, which can infer the aim of the language used to extract meaning and context.

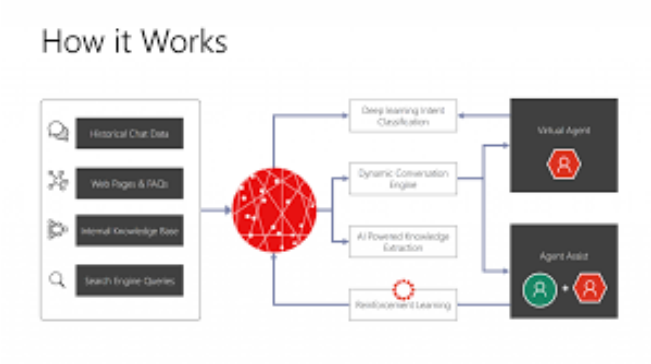

Figure 5: IVA workings

These technologies work together to create an intelligent virtual assistant that can predict a client's purpose and respond appropriately, much like a human customer support representative.

But, even with the most advanced AI technology, IVAs can't foresee what information customers want, so it's critical to make sure the data driving your IVA is accurate. Some IVAs rely on industry-standard data sets, while the most effective ones rely on a company's historical data.

Your customer relationship management (CRM) software saves all previous customer support conversations. If you submit this information to your virtual assistant, the AI will be able to group the most popular themes and detect common "intents" among your customers. You may construct conversation flows to automate these enquiries once you've figured out what your clients want the most.

You may accurately meet clients' demands and personalize your IVA to your brand identity and procedures when this approach is based on historical data rather than pre-built data sets.

Advanced IVAs are quick to learn and develop. A "put it and forget it" strategy is sometimes simpler to set up, but it performs poorly over time. When your IVA recognizes new intentions, it gets more efficient.

Consumers today are accustomed to receiving instant and prompt replies in a variety of situations. Packages can be delivered within 24 hours after placing an order. Real-time information and replies are provided via messaging applications.

So, why is it that any customer service firm considers waiting on hold to be acceptable? Wait times at the Canada Revenue Agency, for example, have risen from an average of 2 minutes to 15 minutes in the four years since 2016.

However, in the actual world of contact centers, there are peak hours that aren't always predictable. Agents can get overworked while dealing with a flood of inbound requests, necessitating the placement of incoming client calls or chats in a queue. Customers may depart a queue as it becomes longer, signaling displeasure, a bad experience, and possibly lost revenue.

By intercepting clients both during peak periods and out of hours, a call deflection bot solution can greatly lessen, if not completely eliminate, wait times and abandonment. It may be built to handle these interceptions in a variety of ways, such as arranging a suitable callback time from an agent, replying to their requests, and completing defined processes.

experience.

Contact centers will need to progressively seek to novel solutions that can combine operational efficiency with enhanced customer experience across whole customer journeys as self-service replaces certain phone or live chat encounters.

In the short term, employing intelligent virtual assistants (IVAs) to support human agents, automate routine activities, and ensure around-the-clock availability is one area where there is a lot to gain.

Intelligent agents help systems and people function more efficiently by taking on time-consuming and difficult tasks on their behalf. These agents may now be used to automate certain tasks.

The development of intelligent agents will be facilitated by technological advancements. As a result, increasingly complex AI-driven solutions will be developed to solve current global concerns. This enthralling technology looks to be limitless.

IVAs have evolved from the early days of rudimentary chatbots, which had a negative reputation for their limited

capacity to accurately answer to client enquiries. Instead, these intelligent virtual agents may be deployed in contact centers as part of a collaborative paradigm, either as a smart buddy or assistant to a human agent, or as a frontline to react to routine enquiries and handoff to a human agent if necessary.

Conversational AI agents must be incorporated into the customer's experience as well as the processes and When human agents are deployed in a contact centre, they use systems. Adopting an integrated and collaborative strategy to deploying IVAs helps strike a fair balance between using a bot for customer care to automate highly repetitive and routine operations and using human agents to handle more complicated and sensitive client concerns.

The function of the genuine human agent in customer experience cannot be totally replaced, no matter how human-like a virtual agent is. Smart virtual agents have the advantage of being able to handle congested chat or phone lines, reply to consumers after hours, assist agents throughout a client engagement, and enable human personnel add more value to customer encounters by taking on and automating typical duties.

6. CONCLUSION

To summaries, intelligent agents have been around for a long time, but their implementation is still in its infancy. Agents will become a crucial element in the future of the Internet as they acquire greater adoption and grow more sophisticated. Telligent agents will not be able to entirely replace surfing, but they will make acquiring information for users or consumers much easier. Instead of looking through endless lists of irrelevant websites, the user might ask their agent to start a search hang, and it would return in a matter of seconds with the information required right away.

Contact centers and Business Process Outsourcing (BPO) providers are under growing pressure to reduce operating costs while fulfilling the demands of increasingly demanding customers and clients. However, as digital technologies enable the growth of customer self-service models, some traditional operational approaches focusing on reducing agent handling times, average cost per call or live chat, and other agent productivity measures may not be sufficient benchmarks for competitiveness and customer satisfaction.

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It gives me a great pleasure to present my research paper Intelligent virtual Agent.

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